National Institute for Health and Care Excellence

Final

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

Evidence review N: Adherence

NICE guideline NG202

Intervention evidence review

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Final

Developed by the National Guideline Centre, hosted by the Royal College of Physicians

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1.1 Review question: What support improves adherence to CPAP or other interventions?

1.2 Introduction

Adherence to interventions such as CPAP/non-invasive ventilation/oral devices/positional modifiers for obstructive sleep apnoea/hypopnoea syndrome (OSAHS), obesity hypoventilation syndrome (OHS) or COPD-OSAHS overlap syndrome is essential in order for these interventions to be effective. Optimal adherence to CPAP therapy is conventionally considered to be four or more hours per night or use for an average of more than 4 hours per night for 70% or more nights. There is some evidence suggesting 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 use of CPAP for four hours per night or more is an arbitrary figure not based on good quality evidence and that people can gain some benefit from a shorter period of use. People should be encouraged to maximise their CPAP use to achieve optimal control of their symptoms, underlying conditions, sleep quality and quality of life. Adherence to other devices is thought to be equally important to gain any benefit.

An evidence review was conducted to assess interventions designed to inform participants about improving adherence of CPAP/ non-invasive ventilation, positional modifiers and oral devices, to support them in using these interventions and to modify their behaviour in improving their use.

1.3 PICO table

For full details see the review protocol in appendix A.

Table 1: PICO characteristics of review question

Population	People (16 and older) with OSAHS, OHS or COPD-OSAHS overlap syndrome. Population will be stratified by: • population: OSAHS, OHS, COPD-OSAHS overlap syndrome • severity: mild, moderate, severe (based on AHI/ODI) • devices: positive airway pressure devices, position modifiers, oral devices • types of interventions (educational, behavioural, supportive)
Interventions	Short term or sustained behavioural intervention aimed at encouraging uptake, acclimation, improvement or maintenance of adherence to long term OSAHS, OHS, COPD-OSAHS overlap syndrome treatment. Examples may include • educational interventions • supportive interventions • interactive interactions • group-based interventions • mindfulness-based interventions • cognitive interventions • behavioural interventions • motivational strategies • combination of multiple interventions.

Comparisons	• any of the above vs no intervention Background level of information and support at the study centre (that must also be provided to intervention group)

Outcomes	**Critical**
	• generic or disease specific validated quality of life measures (continuous)
	• mortality (dichotomous)
	• proportion adherent >4hrs/night for CPAP/non-invasive ventilation (dichotomous)
	• adherence in hours/night for CPAP and oral devices (continuous)
	• self-reported adherence (continuous)
	
	Important
	• mood or anxiety
	• withdrawals
	• treatment related withdrawals (dichotomous)
	• sleepiness scores (continuous, e.g. Epworth)
	• apnoea-Hypopnoea index or respiratory disturbance index (continuous)
	• oxygen desaturation index (continuous)
	• CO_2 control (continuous)
	• minor adverse effects of treatment (rates or dichotomous)
	• driving outcomes (continuous)
	• neurocognitive outcomes (continuous)
	• impact on co-existing conditions:
	  ○ HbA1c for diabetes (continuous)
	  ○ cardiovascular events for cardiovascular disease (dichotomous)
	  ○ systolic blood pressure for hypertension (continuous)

Study design	• RCTs • systematic review of RCTs • parallel or crossover to be included

1.4 Clinical evidence

1.4.1 Included studies

OSAHS

CPAP

Total of 46 studies reviewing educational, supportive and behavioural interventions to improve usage of continuous positive airway pressure machines in adults with obstructive sleep apnoea were included in the review. This included one Cochrane review[5] with 41 studies and 5 additional studies identified in re-runs[12, 34, 43, 57, 61] these are summarised in Table 2 below. Evidence from these studies is summarised in the clinical evidence summary below (Table 3).

Studies were categorised into the following comparisons:

- ***Behavioural vs. Control*** - interventions employing psychotherapeutic techniques deriving from behavioural, cognitive or cognitive-behavioural models of health behaviour change (e.g., specific models within this broad genre include motivational enhancement therapy [Miller], Transtheoretical/Stages of Change Model [Prochaska and DiClemente], CBT [Beck]). By definition, behavioural interventions under any of these related models involves at least a minimal degree of direct participant

engagement or interaction (as opposed to purely educational, in which information is merely imparted to participants, even if the educational content or style of presentation was based on a cognitive/behavioural model).The objectives of such interventions included enhancing motivation for change, self-efficacy, outcome expectations and/or decisional balance in favour of CPAP. There were a broad range of interventions included in this category such as myofunctional therapy, progressive muscle relaxation training, audiotaped music along with softly spoken directions on relaxation techniques and habit-promoting instructions for using CPAP nightly, motivational interviewing, one to one sessions with a clinical psychologist, motivational enhancement which is devised on the principles of motivational interviewing, motivational enhancement therapy and telephone-linked communications.

- ***Educational vs. Control*** – interventions imparting information about CPAP treatment or about OSAHS more generally, delivered through video format, face-to-face didactic sessions, group educational sessions, written materials, or any combination of these. Interventions that did not involve a component of active engagement from the participants other than reading written materials or observing a presentation or demonstration, even if the content derived from a behavioural change model, were classified as educational.
- ***Supportive vs. Control*** - interventions in which participants were provided with additional clinical follow-up (e.g., additional office or home-based visits or phone check-ins by clinical staff) or with telemonitoring equipment that facilitated self-monitoring of CPAP usage or that facilitated monitoring by clinical staff to prompt as needed clinical follow-up (e.g., a phone call made to participants when CPAP usage fell below a predetermined threshold) for the purpose of addressing barriers or difficulties with CPAP usage in a timely manner (e.g. telemedicine systems, digitised phone calls or audio messages, and/or home visits)
- ***Mixed vs. Control*** – interventions that combined elements of the three previously listed intervention-types (e.g. educational video and material provided + telemedicine follow-up)

In cases where studies used a mixed combination of intervention-types (behavioural, educational or supportive), but had multiple active intervention arms that had distinct elements of one type of intervention (e.g. intervention 1 supportive vs. intervention 2 educational vs. control), the active interventions groups were separated and included in the appropriate comparison subcategory for meta-analysis.

Studies had people with moderate and severe OSAHS; however, the majority of the studies were in people with severe sleep apnoea.

No evidence was identified for the critical outcome mortality.

Oral devices

No studies identified educational, supportive and behavioural interventions to improve usage of oral devices in adults with obstructive sleep apnoea, OHS and COPD-OSAHS overlap syndrome.

Positional modifiers

No studies identified educational, supportive and behavioural interventions to improve usage of positional modifiers in adults with obstructive sleep apnoea, obstructive sleep apnoea/OHS and COPD-OSAHS overlap syndrome.

OHS

No evidence identified for improving adherence of CPAP and non-invasive ventilation (NIV) in OHS.

COPD-OSAHS overlap syndrome

No evidence identified for improving adherence of CPAP and non-invasive ventilation (NIV) in COPD-OSAHS overlap syndrome.

See also the study selection flow chart in appendix C, study evidence tables in appendix D, forest plots in appendix E and GRADE tables in appendix F.

1.4.2 Excluded studies

See the excluded studies list in appendix H.

1.4.3 Summary of clinical studies included in the evidence review

Table 2: Summary of studies included in the evidence review for CPAP

Study	Intervention and comparison	Population	Outcomes	Comments
Askland 2020[5] Systematic review 41 studies Inclusion study designs: Randomised, parallel-controlled trials of any duration.	For inclusion in the review, intervention and control groups must have either 1) received the same make of CPAP machine and pressure delivery mode (i.e. fixed, auto-titrating, bi-level, etc.) or 2) receive CPAP machines in a randomly distributed manner, such that machine make remained independent of group assignment. **Intervention group** Any short-term or sustained behavioural intervention aimed at encouraging uptake, acclimation, improvement or maintenance of CPAP adherence among people with a diagnosis of OSA. Examples of modalities that may fall under 'behavioural interventions' include educational, supportive, interactive, group-based, mindfulness-based, cognitive, behavioural, motivational or approaches utilising a combination of these strategies. **Control group**	Participants were adults of either sex with a diagnosis of obstructive sleep apnoea (OSA) diagnosed using a recognised sleep diagnostic tool giving an Oxygen Desaturation Index (ODI) of ≥5 per hours or an Apnoea Hypopnea Index (AHI) ≥5 per hour. Trials that explicitly recruited patients with central sleep apnoea were not eligible for inclusion.	**Primary outcomes** CPAP machine usage (hours/night) as measured by: • microprocessor and monitor that measure pressure at the mask for every minute of each 24-hour day • counter output that records the cumulative time that power is turned on for a CPAP machine (this does not provide information on actual time of day and duration of CPAP used during each 24-hour period) • subjective participant reports of the duration of CPAP use **Secondary outcomes** • proportion of participants adherent (≥4 hours/night)	We have used the data analysed by the Cochrane review team in this review. Majority of the studies for each comparison was in people with severe OSAHS (based on mean AHI) hence they have been categorised as severe OSAHS. When moderate OSAHS studies were included in this stratum, we have downgraded the evidence for indirectness.

Study	Intervention and comparison	Population	Outcomes	Comments
	Participants in the control group may receive instruction that would be used by the study centre in question, provided that the equivalent 'background' level of instruction was also offered and/or delivered to the intervention group.		• symptom scores such as the Epworth Sleepiness Scale (ESS); • disease-specific quality of life scores such as Functional Outcomes of Sleep Questionnaire (FOSQ) or Calgary Sleep apnoea Quality of Life Index (SAQLI) scores; and • Withdrawals from the study. • oxygen desaturation index (ODI), apnoea hypopnoea index (AHI)	
Aloia 2001[4] RCT Country: USA	Participants were randomised into experimental intervention (n=6) or control (n=6). Intervention: After their CPAP–PSG night, subjects returned to the clinic for a follow-up with the sleep medicine physician. All subjects were then administered the first of two one-to-one sessions. The second session was scheduled after subjects had used CPAP for one full week (typically 1 week after the first session). Each session for both the	N = 12 existing patients at investigator sleep centre with OSA. Participants had received prior treatment with CPAP Inclusion criteria: > 55 years of age, RDI (AHI): > 10, Mini Mental Status Examination: > 25 Exclusion criteria: other ICSD, other treatment for apnoea, claustrophobia Baseline Characteristics: Mean age: 63.4, AHI: 43.5, Desaturation: 77.05 ± 9.47.	• Machine usage (hours/night) at 1 week, 4 weeks, 3 months. • N of adherent participants (>= 6 hours per night of usage)	Included in Cochrane review Behavioural vs control Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	experimental and control groups lasted approximately 45 minutes and was conducted by a clinical psychologist. Subjects in the experimental condition were administered an intervention designed to educate them on their individual OSAHS severity and the efficacy of CPAP based on PSG. The specific content of the two experimental sessions were: SESSION 1 Review subject's sleep data Review symptoms noticeable to the subject (e.g., anergia, EDS) Review symptoms not apparent (e.g., hypertension, cardiac problems) Review results of performance on cognitive tests Rate the importance of treatment Review PSG with CPAP and specify how this might address the above problems Discuss the advantages and disadvantages of treatment Develop goals for therapy SESSION 2 Examine compliance data for the first week Discuss noticeable changes with treatment	Baseline characteristics not reported: gender, BMI, ESS.		

Study	Intervention and comparison	Population	Outcomes	Comments
	Discuss changes not apparent (e.g., hypertension, cardiac problems) Troubleshoot discomfort Discuss realistic expectations of treatment Review treatment goals Control: Two sessions: general discussion of sleep architecture and opinions on sleep clinic Study duration: 12 weeks			
Aloia 2013[3] RCT Country: USA	Participants were randomised in a 1:1:1 ratio into one of three groups -- standard care (SC, n=74), education (ED, n=80) and motivational enhancement therapy (MET, n=73)-- balancing for age, sex, education, apnoea severity, and Epworth Sleepiness Scale score. People in the MET and ED groups each received two, 45-min, face-to-face individual counselling sessions by a trained nurse 1 week (7 ± 2 days) and 2 weeks (14 ± 2 days) after initiating PAP treatment. Intervention sessions were delivered after 1 week of PAP use. One additional booster phone call was made to each participant in the MET and ED groups at	N= 227 with OSA. Inclusion Criteria: Age 25-85 years, moderate to severe OSA (AHI > 15) by full in-laboratory overnight polysomnography, naïve to PAP therapy. Exclusion criteria: Diagnosis by split-night PSG; evidence of severe neurological condition or unstable psychiatric illness; sleep disorder other than OSA (including primary central sleep apnoea), CHF, ESRD. Baseline Characteristics: 34% female. Mean age 50.2 (±11.1). Mean AHI 46.7. Mean ESS 12.1. Mean BMI 35.3 kg/m^2.	• CPAP usage (hours/night) at 1, 2, 3, 6, 12 months. • Withdrawals Adherence was measured nightly during the course of the year-long study. Participant average adherence from the beginning of the experiment up to 1, 2, 3, 6 and 12 months were used in analyses, i.e., cumulative mean responses were used). Decisional balance measure consists of both pro items, which assess the benefits of engaging in a particular behaviour, and con items, which assess the costs to the patient of engaging in PAP adherence. A five-point Likert scale was used to rate	Trialists included two intervention arms, one educational and one behavioural. MET vs. Control included in Behavioural meta-analysis. ED vs. control included in Educational meta-analysis. Included in Cochrane review Behavioural vs control Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	week 3 of PAP use. MET: motivational enhancement therapy (MET) MET intervention focused on helping patients resolve their ambivalence regarding consistent use of PAP. The nurse counsellor strived to maintain an atmosphere of collaboration and partnership, rather than education. The counselling sessions were tailored to the individual's readiness to change; less directive approaches were used for those who were ambivalent about using PAP (e.g., asking permission from the patient to discuss aspects of their life that were important to them and how they might be related to sleep), whereas direct problem solving was used for those who were more ready to use and maintain use of the device. Key components of the intervention included: (1) assessing readiness and confidence to change, each on a scale of 1 to 10, and exploring the reasons for choosing that value; (2) discussing what the patient already knows about the effects		each item, with 1 being "not important at all" and 5 being "extremely important." The self-efficacy scale was constructed using assess the extent to which patients believed that they could do the required tasks. Decisional balance and self-efficacy measurements were taken concurrent with the 3-, 6-, and 12-mo PAP adherence measurements	

Study	Intervention and comparison	Population	Outcomes	Comments
	of sleep apnoea and PAP on health, eliciting permission to provide feedback about such health effects, providing the information, and eliciting the patient's interpretation of the information ("elicit-provide-elicit" process); (3) perceived benefits of PAP in order to enhance outcome expectations; (4) goal setting, consistent with both MI style and with social cognitive theory (setting specific, attainable, and realistic goals for use, if motivated); (5) identification of rewards for hard work on adherence to PAP; and (6) discussion of important values and goals and the ways in which PAP adherence facilitates and hinders these goals. ED: Education regarding pathophysiology of apnoea, its medical and behavioural consequences, and the benefits of treatment; presented in standardized formats, with no tailoring to participant readiness. SC: Provided to all participants,			

Study	Intervention and comparison	Population	Outcomes	Comments
	consisted of standard clinical care delivered by the authors' sleep disorders centre. Study Duration: 12 months			
Bakker 2016[8] Open-label, parallel-arm, RCT Country: USA	Eligible participants entered a run-in phase before randomisation, consisting of 14 days wearing a nasal CPAP mask during sleep (without a CPAP device). Participants who reported using the mask during the majority of the run-in and who were willing to continue using the mask were eligible for randomization. Randomization took place in a 1:1:1:1 ratio with a block size of 4, based on three stratification factors: diagnostic study (full night or split night with titration), site, CVD status (established or risk factors) to one of four study arms (two control conditions, two treatment conditions): conservative medical therapy (n=44), sham CPAP (n=42), active CPAP (n=42), or active CPAP +ME (n=41). Analyses in the Bakker et al, 2016 report compared the active CPAP and CPAP + ME arms only. Intervention (Active CPAP + ME): Motivational enhancement (ME): ME is a behavioural intervention devised on the	N=83 participants with OSA Inclusion criteria: AHI 4%, ≥ 10 or AHI 3%, ≥ 15; 45 to 75 years with established CVD or cardio metabolic disease (established coronary artery disease (≥ 70% stenosis in at least one major coronary artery), prior myocardial infarction, coronary artery revascularization procedure, ischemic stroke, or diabetes) OR 55 to 75 years with at least three CVD risk factors (male sex, BMI of 30 kg/m^2 or more, hypertension, dyslipidaemia, and ≥ 10 pack-years of smoking). Exclusion criteria: cardiovascular event < 4 months before enrolment, prior CPAP, ESS > 14 of 24, drowsy driving within 2 years, commercial driving, or an uncontrolled medical condition (including central sleep apnoea, heart failure, uncontrolled hypertension, severe hypoxemia, anaemia, and renal insufficiency). Baseline Characteristics: 33% female. Mean age 63.8	• CPAP usage (hours/night) at 6, 12 months	Included in Cochrane review Moderate OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	principles of motivational interviewing. The premise of the therapy is to honour the natural ambivalence that accompanies any change to behaviour and to approach the patient in a thoughtful and empathetic manner that elicits critical thought to maximize behaviour change. The overall goal of each ME session was to resolve the subjects' ambivalence toward establishing consistent CPAP usage patterns and increase the subjects' confidence toward using CPAP regularly. The psychologist delivering the intervention aimed to maintain a collaborative—rather than educational—style of interaction with each subject. Each session involved a discussion regarding the subject's readiness to begin CPAP, the subject's understanding of the health risks associated with untreated OSA, and the extent to which the subject believed that consistent CPAP use could resolve these risks. Each subject was encouraged to set concrete goals regarding their future CPAP use and identify rewards that they would provide themselves when those	(NR). Mean AHI 22.8. Mean ESS NR. Mean BMI 31.1 kg/m^2.		

Study	Intervention and comparison	Population	Outcomes	Comments
	goals were achieved. ME was delivered during 1-hour in-person sessions at baseline and week 1, which included an educational video, and during phone calls of 10 to 30 minutes with the same psychologist at weeks 3, 4, 8, 12, 20, and 32. In-person sessions were audio recorded, to allow independent assessment of fidelity to the intervention framework. Control (Active CPAP): For the Bakker et al, 2016 report and the present Review, CPAP only arm served as the control. Study Duration: 12 months.			
Berry 2020[12] Randomised parallel-group trial. Country: USA	(n=124) Intervention 1: Cloud-based sleep coach (CBSC) Participants randomised to SC+CBSC follow-up received all elements of standard care and, in addition, interaction/communication from the CBSC service. The participants were informed that they would receive a telephone call from the CBSC system in 3 to 4 days to discuss their experience with therapy. Further contact from the CBSC could be expected if their adherence goals were not reached. All participants received calls on day 3 to 4 and	(n=250) (Standard care, n= 126, standard care + cloud-based sleep coaches (CBSC), n= 124). Inclusion criteria: Age 21 to 75 years (men and women) Diagnostic apnoea-hypopnea index ≥ 15 events/h (diagnostic polysomnography [PSG], diagnostic portion of split PSG, or home sleep apnoea test) Eligible for treatment with automatically adjusting continuous positive airway pressure or bilevel positive airway pressure	• AHI • ESS • Number of days used >4 hours at 3 months Follow-up 3 months	Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	on day 32 after PAP initiation. The participants were also provided with information on, and encouraged to use, the mobile application (PAPapp), allowing them to view their current adherence. (n=126) Intervention 2: standard care Participants attending PAP setup classes were educated about use of their PAP device, including cleaning, ramp option, and humidification. All patients were encouraged to use therapy nightly for as long as they can, preferably for the entire time they sleep. Each participant was fitted with a mask based on physician order, participant preference, and the ability to obtain a good mask seal. The type of PAP device (auto-adjusting CPAP or auto-adjusting bilevel PAP) and pressure settings were determined by physician order. Participants practiced putting on their masks and turning on the PAP device. All devices contained wireless modems with information accessed via a cloud-based programme. Device data were uploaded into the database via wireless	Residence in area covered by wireless network. Age: CBSC 54.9 ± 11.5 years; control: 55.2 ± 13.4 years AHI: CBSC 36.6 ± 20.6 events/h; control 36.7 ± 21.1 events/h Gender male %: CBSC 88.7%; control 89.7% Sleepiness: ESS: CBSC 11.2 ± 6.0; control 10.8 ± 6.1		

Study	Intervention and comparison	Population	Outcomes	Comments
	modems programmed to call in automatically. Device data were associated with the individual participant based upon the serial number of the device and modem entered by the staff. All PAP devices had the ability to deliver heated humidification. At the PAP setup class, participants received information about the PAPapp (written information also supplied with each PAP unit). Participants were provided with telephone numbers for PAP supply replacement and for PAP treatment issues. They were also encouraged to use the secure messaging service "My Healthy Vet" to facilitate communication with the sleep providers. Participants had a 6-week inspection of adherence and efficacy data if ordered by the physician reading the sleep study. Pressure settings could be changed remotely based on physician order. A participant could be scheduled for an individual mask fitting CPAP RT appointment if discomfort or leak issues were significant. A 3-month (90 to 120 days) sleep clinic visit with a sleep provider (physician or physician extender) was scheduled.			

Study	Intervention and comparison	Population	Outcomes	Comments
Bartlett 2013[9] Randomised parallel-group trial. Country: Australia	Prior to recruitment, a randomization sequence by group using random permuted blocks with a 1:1 allocation ratio to control arm, Social Interaction (SI, n=97) or intervention arm, Social Cognitive Therapy (SCT, n=109). SCT: Intervention was based on social cognitive theory factors, including perceived self-efficacy, outcome expectations, and social support. Participants were encouraged to list goals, given slide presentations to discourage unhelpful thoughts of CPAP side effects, taught relaxation strategies, and given additional booklets containing information about sleep OSA/CPAP, and general health. SI: a basic social intervention was given to ensure that equal time was spent with all study participants; SI group was shown a 15-minute video that followed a patient's journey from their baseline diagnostic sleep study to being diagnosed with OSA and undergoing a CPAP titration study. Study Duration: 6 months	N=206 participants with moderate-severe OSA referred to CPAP therapy. Inclusion criteria: None reported other than moderate-severe OSA. Exclusion criteria: Unable to understand fluent English, any previous use of CPAP. Baseline Characteristics: 32% female. Mean age 48.1 (±13.2). Mean AHI 34.9. Mean ESS 11.9. Mean BMI 30.4 kg/m^2.	• CPAP usage (hours/night) at 6 months. • N of adherent participants (usage ≥ 4 h per night) • Sleepiness (ESS) • QoL (FOSQ) CPAP usage was assessed at 7 nights, then 1, 3, and 6 months.	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
Basoglu 2011[10] Randomised, parallel-group study Country: Turkey	Participants were randomised into video education intervention (n=66) or control (n=67). Intervention: 10-Minute videotape on OSA, its consequences and CPAP therapy. In addition, routine information on diagnosis and treatment of OSA given by physician Control: Standard information on OSA and CPAP therapy given by the same physician Study duration: 24 weeks	N = 133 newly diagnosed moderate-to-severe OSAS patients Inclusion criteria: newly diagnosed, moderate to severe OSA, CPAP naive Exclusion criteria: use of sedatives, drug abuse, cardiac co-morbidities, COPD, other sleep disorders Baseline Characteristics, by group: *Intervention group:* Age: 53.7, Male sex: 82%, AHI 61, ESS: 10.3, BMI: 33.2. *Control group:* Age: 54.4, Male sex: 70%, AHI: 57.4, ESS: 12.4, BMI: 33 kg/m^2	• Number of adherent participants (CPAP use for at least four hours/night for at least 70% of nights at 1, 3, 6 months • Sleepiness (ESS)	Included in Cochrane review Unpublished information on study design and outcomes obtained from study authors Severe OSAHS based on mean AHI
Bouloukaki 2014[13] Randomised, parallel-group study. Country: Greece	Eligible patients (n=3100) were randomly assigned in a 1:1 ratio to receive either the standard intervention (n=1550), of usual follow-up care, or the intensive intervention (n=1550), with augmented follow-up care based on additional appointments at the CPAP clinic, telephone calls and education. Intensive Intervention: Patients received the same features as standard group, with the addition of follow-up visits involving patients' partners or family. All patients attended a 15-minute video education	N=3100 patients with newly diagnosed sleep apnoea randomised to either the standard group (usual follow-up care) or the intensive group (additional visits, telephone calls, and education). Inclusion criteria: newly diagnosed with OSAHS by PSG, moderate-to-severe OSAHS, no history of previous CPAP therapy, and above-elementary school education. Exclusion criteria: refusal to participate, refusal of CPAP	• CPAP usage (hours/night) at 1 month, 2 years • Number of adherent participants (>= 4 hours/night for >= 70% of nights) • Sleepiness (ESS) • QoL (SF-36) • Withdrawals	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	session cover OSAHS related topics, including the syndrome itself, treatment options, and the benefits of adherence to therapy. This was followed by a 10-15-minute lecture used to reinforce key concepts. During the first week of CPAP set-up, patients were contacted by the nurse, on the second and seventh day, via telephone in order to discuss any concerns they might have regarding air pressure, mask fitting, leaks and other issues as they arose. During the first month of treatment, patients were instructed to keep a sleep diary, and were reviewed by a sleep specialist on the 15th and 30th day of treatment. Standard Care: patients were reviewed in the outpatient sleep clinic at 1 month, at 3-month intervals during the first years, and every 6 months afterwards. During these appointments, a clinical assessment was made, and patients were further encouraged to use the device. If there were doubts about compliance, the referring physician made personal contact with the patient in order to resolve barriers to adequate compliance. Study Duration: 2 years	therapy, central sleep apnoea syndromes, obesity hypoventilation syndrome, restrictive pulmonary and restrictive chest wall diseases, severe congestive heart failure, a history of life-threatening arrhythmias, severe cardiomyopathy, long-term oxygen therapy, family or personal history of mental illness, drug or alcohol abuse, severe cognitive impairment, concurrent oncological diseases, and a history of narcolepsy or restless legs syndrome. Baseline Characteristics: 25% female. Mean age 55.6 (±10.2). Mean AHI 52. Mean ESS 12.1. Mean BMI 37.8 kg/m^2.		

Study	Intervention and comparison	Population	Outcomes	Comments
Chen 2015[16] Randomised, parallel-group study. Country: China	85 participants were randomised to nurse-led intensive vs standard support, of which 5 refused to participate (group allocation of refusals not reported), resulting in n=40 receiving intervention and n=40 receiving control condition. Intervention: Hospital health education, consisting of pre-treatment 30-minute educational video that explained the pathogen, mechanism, risks, benefit, and treatment methods for SAHS; personalized guidance from a nurse; and a SASH Health education Manual. In addition, several patient self-management interventions were delivered including: 15-minute interview with nurse for troubleshooting within 5 days of receiving CPAP treatment, nurse home visits after CPAP treatment was initiated, healthy lifestyle (diet, exercise) guidance, and a psychological intervention, informing patients of the importance of maintaining a good mental state for disease rehabilitation, and teaching the patients methods and techniques on how to respond to anxiety and depression. Finally, each	N=85 participants with new SAHS diagnosis. Inclusion criteria: AHI >15, daytime sleepiness, two major symptoms of the syndrome, lived within 100 miles from Zhejiang. Exclusion criteria: previously received CPAP therapy, suffering with chronic obstructive pulmonary disease, asthma, or neurological problems. Baseline Characteristics: 38.3% female. Mean age 50.4 (NR). Mean AHI 54.5. Mean ESS 13. Mean BMI 32.5 kg/m^2.	• CPAP usage (hours/night) at 1, 3, 6, 12 months. • Sleepiness (ESS) • QoL (SF-36)	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	subject in the intervention arm received a ~30-minute consultation with sleep physician within 1 month of CPAP initiation. Control: ~30-minute consultation with sleep physician at 1, 3, 6 and 12 months. Study Duration: 12 months.			
Chervin 1997[17] Randomised parallel-group trial Country: USA	No information provided as to the group allocation of all randomised subjects. Allocation Ns only available for the 33 participants who completed the study: Intervention group 1 (n=12), Intervention group 2 (n=14), control (n=7). Intervention 1: Telephone call each week during trial (max trial time of two months) Intervention 2: Two printed documents Control: No additional support Study duration: 8 weeks	N = 40 subjects with OSA (about to start or already receiving CPAP) recruited from clinic. Baseline Characteristics: Mean age 51.7. Mean AHI 49.4. ESS 10.9 ± 5.1. Lowest 02 Sat 75.6% (± 14.4). MSLT 6 (± 3.9)	• Machine usage (hours/night) at 1 to 2 months • Dropouts/Lost-to-follow-up	Included in Cochrane review Two of 33 used Bi-PAP. Both CPAP-naive users and those who had been on CPAP before trial were studied. Reading done at enrolment and at between 1 to 2 months after enrolment Difference in AHI between active and control groups at baseline. Trialists included two intervention arms, one educational and one supportive. Intervention 1 (telephone support) vs. Control included in Supportive meta-analysis. Intervention 2 (educational documents) vs. control included in Educational meta-analysis. Severe OSAHS based on mean AHI
Dantas 2015[20] Randomised parallel-group trial.	Motivational interviewing: a single group session is delivered 1 month after	N=41 patients diagnosed with OSAS, meeting the criteria for APAP therapy,	• CPAP Usage (hours/night) at 1 and 2 months.	Moderate and severe OSAHS

Study	Intervention and comparison	Population	Outcomes	Comments
Country: Portugal	beginning APAP therapy to promote adherence among patients newly diagnosed with OSAS. This standardised group educative session was conducted by a pulmonologist, a psychologist, and a respiratory physiotherapist and includes information about OSAS and APAP treatment goals and function mode. Two questions were used to gauge the patient's conviction and confidence: "How important to you is the use of the device in your treatment?" and "How confident are you that you can use the device?" The degree of conviction and confidence permitted to establish the stage of change in each patient and to define specific strategies to be applied in an individual 10-min-long interview. During the intervention, the patient's beliefs, expectations, and feelings were assessed. The authors postulated that according to Prochaska and co-workers that a pre-contemplation stage corresponded to a score of 0 to 3 in the conviction and confidence scales. At this	were randomly allocated to one of two groups: Intervention Group (IG) brief educational intervention (n=20) using motivational strategies or control group 1 (CG1, n=21). ('Control Group 2' (CG2) comprised a convenience sample selected from the sleep lab's initial consultations but were not part of the randomization procedures.). Inclusion criteria: >18 years old, AHI >= 15, diagnosis that indicates ventilator (CPAP) therapy, willingness to participate in the study. Exclusion criteria: chronic obstructive pulmonary disease, neuromuscular disease, heart disease, neurological disease, and patients taking psychotropic drugs. Baseline Characteristics: 23% female. Mean age 56.5 (±10). Mean AHI NR. Mean ESS 9.9. Mean BMI 32.9 kg/m^2.	• % Days of APAP use (>4 h per night on 70 % of the nights during a period of 30 consecutive days) • Sleepiness (ESS) • AHI	

Study	Intervention and comparison	Population	Outcomes	Comments
	stage, patients were informed about the disease, the possible benefits of the treatment, and the risks of noncompliance with the treatment. To be considered in the contemplation stage, patients had to rate their conviction between 2 and 5 and their confidence between 5 and 8. At this stage, the intervention focused on emphasizing intrinsic motivation and reaffirming the patient's autonomy regarding whether or not to adhere to the treatment. When patients rated their conviction between 6 and 8 and their confidence between 7 and 10, they were considered in the preparation stage. In this stage, they were assisted with developing concrete plans and clarifying objectives. At the end of the intervention, a new interview was scheduled, and written information was delivered about OSAS disease and treatment. control: Participants received only standardized information about APAP (the device and interface) during the 10-min interview, regardless of their confidence and conviction scores. "Control Group 2" (CG2) is a			

Study	Intervention and comparison	Population	Outcomes	Comments
	convenience sample submitted to standard procedures, which was not part of the randomization procedures. CG2 is excluded from Review. Study Duration: 2 months			
DeMolles 2004[24] Randomised parallel-group study. Methods of randomisation not reported Country: USA	Participants were randomised to Telephone-linked communications technology (TLC, n=15) versus usual care (UC, n=15). UC: Described as usual medical care, patient education and demonstration of equipment use. TLC: UC plus computerised digitised human speech programme. TLC asks questions designed to elicit information from participant regarding adherence, education and reinforcement. Study duration: 8 weeks	N = 30 patients being started on CPAP for OSAS. Inclusion criteria: Starting nasal CPAP therapy; > 18 years; English-speaking; AHI > 15 Exclusion criteria: Prior CPAP use. Baseline Characteristics: Mean age 46. Mean BMI 38 kg/m^2. Mean AHI 40. Functional Outcomes of Sleep Questionnaire: TLC: 15.3, Control: 13.8	• CPAP usage (hours/night) at 2 months • QoL (FOSQ)	Included in Cochrane review Severe OSAHS based on mean AHI
Diaferia 2017[26] Randomised parallel-group study. Country: Brazil	Participants were randomised to 2 of 4 study groups were considered: CPAP only (n=27) or CPAP + myofunctional therapy (MT, n=22). [Full study had 2 additional arms: placebo myofunctional therapy (n=24) and myofunctional therapy (n=27) in addition to those noted above for this review.] *CPAP only: standard care,	For this Review, only the N=49 (male) participants with OSAS Inclusion criteria: Men aged 25-65 years, BMI of less than 35 kg/m^{2,} confirmed OSAS diagnosis (via polysomnographic criteria). Exclusion criteria: Female gender (excluded “since hormonal decline in the menopausal phase could	• CPAP usage (hours/night) at 1 week, 1 and 3 months • N of adherent participants (usage ≥ 4 h per night on 70% of nights) • Sleepiness (ESS)	Included in Cochrane review Only CPAP and CPAP + Myofunctional therapy groups included in Review/meta-analysis.

Study	Intervention and comparison	Population	Outcomes	Comments
	including attending a PSG to determine optimal pressure of CPAP Myofunctional therapy +CPAP: Myofunctional therapy consisted of muscular endurance exercises aimed at toning the oropharynx muscle groups; optimizing muscle tension mobility; and adjusting the position of the soft tissues and the suitability of the chewing, sucking, swallowing, and breathing orofacial functions, according to previously standardised protocols. The therapies were performed at home for 3 months with three daily exercise sessions of 20 min each. Study Duration: Patients underwent evaluations before and after 3 months of treatment, and after 3 weeks wash-out period.	lead to loss of muscle mass, causing a bias in the study"), other sleep disorders, previous treatment for OSAS, serious or decompensated clinical or psychiatric medical illnesses, such as congestive heart failure, cardiomyopathy, chronic obstructive pulmonary disease, chronic active hepatitis, liver cirrhosis with severe symptoms, myasthenia gravis, demyelinating disease, motor neuron disease, depression, schizophrenia, obsessive compulsive disorder, disorder anxiety, bipolar disorder, eating disorder, attention deficit disorder, and hyperactivity; patients who used alcohol, stimulants or sedatives; and patients with grade III or IV palatine tonsils, grade II or III septal deviation, or evident micrognathia. Baseline Characteristics: 0% female. Mean age 46.9 (±9.9). Mean AHI NR. Mean ESS 12. Mean BMI 28.3 kg/m^2.		
Falcone 2014[29] Randomised,	Participants were randomised into educational support (ES,	N=206 newly diagnosed patients with OSA	• CPAP usage (hours/night) at 1, 3,	Included in Cochrane review

Study	Intervention and comparison	Population	Outcomes	Comments
parallel-group study. Country: Italy	n=103) or standard support group (SS, n=103). SS: Sleep medicine physician provided each subject a full explanation (~10 minutes) of the need for and benefits of CPAP. Prior to CPAP titration the subjects received education regarding CPAP operation, mask placement, and a 20-min period of auto-CPAP exposure. ES: In addition to standard support, each educational support group subject viewed 2 consecutive PSGs on the computer screen: the first recorded during a standard diagnostic overnight polysomnography, and the second during a full-night polysomnography with nasal CPAP. The subject's attention was drawn only to the flow and oxyhaemoglobin saturation curves. Study Duration: 12 months	Inclusion criteria: newly diagnosed OSA, AHI ≥15 events/h, with or without daytime symptoms. Exclusion criteria: COPD, any global respiratory failure, central sleep apnoea syndrome, previous diagnosis of congestive heart failure or cardiomyopathy, any chronic neurological disorder, any severe mental or psychological impairment. Baseline Characteristics: 25% female. Mean age 61.3. Mean AHI 54. Mean ESS 11.2. Mean BMI 32.1 kg/m^2.	12 months. • Sleepiness (ESS)	Severe OSAHS based on mean AHI
Fox 2012[30] Randomised parallel-group study Country: Canada	Participants were randomised to telemedicine intervention (TM, n=39) or standard care (SC, n=36). TM: Physiological data (PAP adherence, applied PAP, mask leak, residual respiratory events) were downloaded using modem attached to the PAP device and sent across the	N = 75 adults with moderate-severe OSA by PSG. Inclusion criteria: adult (≥ 19 years), moderate to severe OSA (AHI ≥ 15) Exclusion criteria: active cardiopulmonary or psychiatric disease, previously treated for OSA, no access to telephone line	• Machine usage (minutes per day) • Adherence on nights PAP used • % days PAP used • Decrease in ESS • AHI on treatment	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	telephone line each morning. Downloaded information was reviewed every weekday except holidays by the research coordinator, who contacted the participant if poor compliance or other problems with treatment (e.g. mask leak) were detected. Participants were advised over the phone or visited the PAP coordinator. Standard care identical to control group SC: 20-Minute orientation to PAP session and mask fitting. Participants contacted after two days to check adherence and to troubleshoot problems, followed up at four to six weeks and at three months; each time, physiological data downloaded from machines and any problems with treatment addressed. In addition, data downloaded at eight weeks Study duration: 12 weeks	in bedroom, not able to return for follow-up Baseline Characteristics: 20.1% female. Mean age 53.5 (±11.2). Mean AHI 41.6. ESS 9.8. BMI 32.4 kg/m^2.		
Hanger, 2018[34] Randomised, parallel-group study. Country: USA	(n=23) Intervention 1: Telemedicine care group (TM). In addition to standard care, participants randomised to the TM group received the intervention, which entailed an initial call to all participants after one week of PAP therapy. CPAP usage data was monitored weekly via a web-	(n=56) (standard care, *n*=23); telemedicine (*n*=33). Inclusion criteria: Adults, at least 18 years of age, newly diagnosed with moderate to severe OSA on HSAT or PSG; provision of CPAP device by DME with wireless data transmission capability	• AHI at 3 months • ESS at 3 months • Number of days used >4 hours at 3 months	Severe OSAHS based on mean AHI.

Study	Intervention and comparison	Population	Outcomes	Comments
	based database. Use of CPAP of less than 4 hours per night, on less than 70% of nights (or more than 2 days), in the preceding week of monitoring, was considered non-adherent and triggered a phone call from the research coordinator to provide support and troubleshooting as needed. Participants were seen back in clinic after 6 weeks, per standard care. Data monitoring, as outlined above, continued for the first 3 months of CPAP usage. The study period culminated with a phone call, by the author, to all participants from both study arms, at the end of 3 months, to discuss any questions or concerns and to survey satisfaction of their follow-up care. (n=23) Intervention 2: Standard care Participants in the standard care (SC) group received the standard follow-up regimen currently used by the Sleep Center. Following diagnosis of moderate or severe OSA and the participant was prescribed CPAP therapy. Patients obtained equipment; they were fitted with a mask and given	and English speaking. Age (mean SD): medicine 60.0±14.2; control: 51.4±13.8 AHI: telemedicine38.0±21.1; control 37.27±18.8 Gender: female%: telemedicine 42; control 42.1 Sleepiness: ESS: telemedicine 8.8±4.9; control 11.3±5.5		

Study	Intervention and comparison	Population	Outcomes	Comments
	instructions on set up, use and care of the PAP machine. Devices were equipped with wireless data transmission technology. Patients were advised to call for any equipment concerns and the Sleep Center with any other concerns or questions related to PAP use; they were seen back in clinic after 6 weeks to discuss adherence and efficacy, review device data, and to address any issues or questions they may have. If patients were doing well, they were seen back yearly for monitoring, with more frequent follow-up if needed.			

Study	Intervention and comparison	Population	Outcomes	Comments
Hoet 2017[36] Randomised, parallel-group study. Country: Belgium	Participants were randomised to usual care (UC, n=23) or telemonitoring (TM, n=23) group. TM: In addition to usual care, telemonitoring device was attached to CPAP machines. Via this device, sleep laboratory technical staff analysed participant data and contacted patients in the case of air leaks, residual AHI >10/h, or CPAP use less than 3 hours in three consecutive days UC: Group educational session 1 month after CPAP initiation, and a visit to the pneumologist scheduled and 1.5 and 3 months after CPAP initiation. Study Duration: 3 months	N=46 patients with a recent diagnosis of moderate to severe OSAS Inclusion Criteria: At least 18 years old, recently diagnosed with OSAS (AHI ≥20/h). Exclusion criteria: previous exposure to CPAP therapy, mixed/predominantly central sleep apnoea, language barriers, cognitive or psychiatric disorders making it difficult to comprehend information regarding CPAP therapy and provide informed consent, significant comorbidities such as severe chronic obstructive pulmonary disease or hypoventilation syndromes. Baseline Characteristics: 63% female. Mean age 56.6 (±13.5). Mean AHI 49.5. Mean ESS 11. Mean BMI 31.5 kg/m^2.	• CPAP usage (hours/night) at 3 months.	Included in Cochrane review Severe OSAHS based on mean AHI
Hoy 1999[37] Randomised, parallel study. Method of randomisation not reported. ITT Country: UK (Scotland)	Participants were randomised into usual care (UC, n=40) or Telemonitoring (TM, n=40). TM: Full explanation of need for and benefits of CPAP by sleep physician, 20-minute video education programme, given mask to try for 20 minutes, titration of CPAP pressure overnight with following day	N = 80 patients with SAHS. Inclusion criteria: AHI ≥ 15, plus daytime sleepiness or two other major symptoms of the syndrome; resident within 50 miles of Edinburgh Exclusion criteria: prior use of CPAP; coexisting COPD, asthma or neurological problems	• Machine usage (hours/night) at 6, 12 months • Quality of life • Symptom score (in-house questionnaire) • Epworth Sleepiness Scale score	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	discharge, nurses telephoned on days two and 21, reviewed in hospital at one, three and six months. Initial education at home with partner, two extra nights in hospital, sleep nurses' home visits to participant and partner at seven, 14 and 28 days and four months after starting CPAP UC Full explanation of need for and benefits of CPAP by sleep physician, 20-minute video education programme, given mask to try for 20 minutes, titration of CPAP pressure overnight with following day discharge, nurses telephoned on days two and 21, reviewed in hospital at one, three and six months Study Duration: 6 months	Baseline Characteristics: 2.5% female. Mean age 51 (±11). Mean AHI 58. Mean ESS 13. Mean BMI 33 kg/m^2.		
Hui 2000[38] Randomised, parallel-group study Country: China (Hong Kong)	Participants were randomised to basic CPAP support (BS, n=54) or augmented support (AS, n=54) AS: 10-Minute CPAP education programme by respiratory nurse, brochure on OSA and CPAP treatment in Chinese, short trial CPAP therapy with comfortable mask for 30 minutes, CPAP titration on second night of study by AutoSet, nursing support following day, follow-up by	N = 108 patients with newly-diagnosed OSA. Inclusion criteria: diagnosis of OSA (AHI > 10 and subjective daytime sleepiness) Exclusion criteria: none reported. Baseline Characteristics: 10% female. Mean age 45 (±11). Mean AHI 48. Mean ESS 12.8. Mean BMI 30 kg/m^2.	• Machine usage (objective and participant reported) • At least four hours of CPAP use/night for at least 70% of nights/week) • Quality of life • ESS • SAQLI	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	nursing staff and physician at 1 and 3 months. Locally produced 15-minute videotape, additional nurse led 15-minute educational session, review by physicians at weeks one and two, respiratory nurse telephone call on days one and two, weeks one, two, four, eight and 12 BS: 10-Minute CPAP education programme by respiratory nurse, brochure on OSA and CPAP treatment in Chinese, short trial CPAP therapy with comfortable mask for 30 minutes, CPAP titration on second night of study by AutoSet, nursing support following day, follow-up by nursing staff and physician at 1 and 3 months. Study duration: 12 weeks			
Hwang 2017[39] Cluster-randomised parallel-group study Country: USA	Classes (and all participants in each class) were randomised (1:1:1:1) to one of four arms: 1) web-based OSA education (Tel-Ed, n=380), 2) telemonitoring and automated feedback (Tel-TM, n=375), 3) Tel-Ed + Tel-TM (Tel-Both, n=346), and 4) usual care (UC, n=354) using a four-arm, randomised, factorial design. Usual Care: All patients attended a 1-hour, small-group	N=1455 patients with suspected OSA were randomised to four study arms, by class-based (cluster) randomised design. This study used the existing home-based testing triage structure at the trialists institution. As they report, "Most patients are referred by primary care physicians, and a sleep medicine physician triages appropriate	• CPAP usage (hours/night) at 90 days • Sleepiness (ESS) • Residual AHI • Number of adherent participants (Medicare definition, usage ≥ 4 h per night) • QoL (FOSQ)	Included in Cochrane review Trialists included three intervention arms. One arm was educational (Tel-Ed), one was Supportive (Tel-TM) and the third was Mixed (Tel-Both). These were compared to control in respective meta-analyses (i.e., Educational, Supportive, Mixed). Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	education class with HSAT setup. After the trial, those willing to continue CPAP were prescribed therapy and scheduled for a 3-month follow-up appointment. Tel-Ed: Education about the pathophysiology of OSA, health-related risks, impact on daytime vigilance, introduction to CPAP therapy. For patients eventually determined to have OSA, a link to a second education program was emailed. This focused on how to use CPAP, potential benefits, methods of acclimating, and equipment care instructions. Education sessions were interactive and self-paced. Tel-TM: Intervention based on automatic processing of device data. During the 3-month study period, if CPAP usage thresholds were met, a message was automatically sent to the patient providing encouragement to improve use or positively reinforcing successful adherence. Tel-both: Patients received Tel-Ed and Tel-TM Study Duration: 90 days	patients to home sleep apnoea testing (HSAT) after review of the referral information and electronic health record chart. HSAT classes (up to 13 people) are led by a sleep trained respiratory therapist and sleep technologist and provide interactive OSA education and individualized HSAT setup. After a one-night test, each patient returns for an individual appointment with a respiratory therapist to review the results. Those with OSA are recommended to undergo a 1-week CPAP trial followed by an individual return appointment with a respiratory therapist to review CPAP data and patient experience. Patients willing to commit to CPAP therapy is immediately dispensed a device; otherwise CPAP troubleshooting or alternative treatments are discussed." This trial enrolled Consecutive patients referred to the Kaiser Permanente Fontana Sleep Disorders Centre (Fontana, CA) for evaluation of suspected OSA and triaged		

Study	Intervention and comparison	Population	Outcomes	Comments
		to HSAT between November 2014 and August 2015.To conform to the sleep centre's usual care procedures, groups of patients were randomised, with all participants in each HSAT class following the same treatment arm. Inclusion criteria: At least 18 years of age, no previous sleep testing or trial of OSA therapy, eligible for HSAT. Exclusion criteria: At risk of other sleep disorders (e.g., severe insomnia), significant cardiopulmonary disease (e.g., heart failure, chronic respiratory failure), or English not preferred language. Baseline Characteristics: 51% female. Mean age 49.1 (±12.5). Mean AHI 22.7. Mean ESS 9.1. Mean BMI 34 kg/m^2.		
Kotzian 2019[43] RCT Austria	(n=70) Intervention 1: tele medical monitoring system to improve CPAP adherence. All patients referred to PAP therapy received a 30 min introductory lesson with nasal or oro-nasal mask fitting, device handling and information about PAP therapy. Patients were provided with an	Subacute adult (19-70 years of age) stroke survivors (>1 months to <1 year post stroke) with a completed stroke confirmed by a neurologist based on the history of a sudden onset of a neurological deficit lasting longer than 24 h, the presence of a neurological	• Days PAP used >4 h- new outcome • AHI • Mean adherence all days (min per day)- new outcome	Follow-up 12 months Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	AirSendse 10 Autoset CPAP including humidifier and were set to auto-titrate at pressures between 6 and 13 cm H20. The PAP coordinator at the homecare provider reviewed the downloaded information every morning except on weekends and holidays and contacted the patients if the 90th percentile of pressure was >16 com H20 or mask leakage of the 95th percentile was >24l/min or use was <4h or the AHI was >10 events/h for three consecutive days. (n=181) Intervention 2: Standard PAP treatment. No tele medical monitoring system	deficit upon physical examination, and a brain lesion compatible with the neurological deficit in computerised tomography or MRI of the brain were included. For evaluation of OSA, eligible patients underwent in hospital sleep studies. Therapy relevant OSA was defined as showing an AHI >15 per hour of sleep, indicating moderate sleep apnoea. Age: telemonitoring: 62.9 (5.3 years); control: 61.8 (5.3) years Gender: male: telemonitoring 64.7%: control: 75% BMI: telemonitoring: 30.9 kg/m^2 (4.8): control: 29kg/m^2 (3.1) AHI: telemonitoring: 37 (14.1): control: 37 (12.8)		
Lai 2014[46], Lai 2017[44] Randomised, parallel-group study Country: China (Hong Kong)	Participants were randomised to usual care (UC, n=51) or UC + brief motivational enhancement program (ME, n=49). UC: Usual Care: Usual care was provided by nurses in the Sleep Disorders Center who provided a 15-min talk to	N=100 patients with newly diagnosed OSA. Inclusion Criteria: At least 18 years old, newly diagnosed OSA, AHI >= 5, receiving in-laboratory auto-CPAP titration for the first time, no prior OSA or CPAP education classes.	• CPAP usage (hours/night) at 1 and 3 months. • Number of adherent participants (usage ≥ 4 h per night for at least 70% of nights) • Sleepiness (ESS) • QoL (FOSQ,	Included in Cochrane review Moderate OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	introduce the basic operation of the CPAP device and titration procedure. Subjects tried the CPAP device for approximately 30 min for acclimatization before the start of the overnight titration procedure. The next morning after CPAP titration, the subject met the medical officer-in-charge, who provided an explanation of OSA, explained the subject's particular test results, and prescribed treatment. Nurses gave further advice (about 15 min) on the importance of CPAP therapy and care of accessories before the subjects were given their devices and discharged from the Sleep Disorder Center. ME: Brief Motivational Enhancement Education: The aim of brief motivational enhancement education is to enhance those factors that may influence behavioural skills and bring about behavioural change. The brief motivational enhancement education programme, which was designed to enhance the subject's perception of the risk of OSA, confidence in the	Exclusion criteria: central sleep apnoea, periodic leg movement disorders, COPD, pregnancy, psychiatric illness on treatment, cognitive impairment, illiteracy, unstable health conditions, unable to attend the education session before discharge from Sleep Disorders Centre, scheduled for OSA follow-up in other hospitals, or participating in another clinical trial. Baseline Characteristics: 17% female. Mean age 51.98 (±10). Mean AHI=29.42. Mean ESS=9.25. Mean BMI=28.96 kg/m^2.	CSAQLI, SF-36) • ESS Follow-up 3 months and 1 year	

Study	Intervention and comparison	Population	Outcomes	Comments
	ability to apply CPAP treatment (self-efficacy), and association of their behaviour to the desired outcome (adherence) or outcome expectancy, included a session in the morning after CPAP titration and a telephone call on day 2 of CPAP use, providing early follow-up. The subject was shown a 25-min video together with an information booklet providing the knowledge on OSA and CPAP. The video included the real-life experience of a current CPAP user. Then, a 20-min patient centred face-to-face brief motivational interview was conducted and aimed to facilitate the subject's intrinsic motivation toward CPAP therapy. Several tools and strategies were applied, which were as follows: (1) using importance and confidence rulers with higher-lower exercise to explore the barriers and facilitators of using CPAP (2) using a decision matrix to discuss the positive and negative aspects of using or not using CPAP, and (3) looking forward to the expected outcomes or benefits			

Study	Intervention and comparison	Population	Outcomes	Comments
	of using CPAP. The interview was conducted by one of the investigators who was both a nurse and polysomnographic technologist who had received prior training to conduct motivational interviews by a clinical psychologist (member of Motivational Interviewing Network of Trainers). Thereafter, a 10-min phone call was made to the subjects by the same interviewer on day 2 of CPAP use. Checklists for interview and phone follow-up were used to ensure treatment fidelity. Duration: 3 months.			
Lewis 2006[47] Prospective, single-blinded interventional study Country: UK	Participants were randomised to standard support (SS, n=36) or intensive support (IS, n=36) group. IS: 20-Minute educational video about SAHS. Telephone interview by research assistant between days two and five after CPAP issued to identify early problems and advise. Extra appointment to see sleep physician within seven to 14 days after being issued CPAP. Further appointment with sleep physician at 1, 6, and 12 months	N = 72 patients with newly diagnosed SAHS immediately prior to CPAP titration. Inclusion criteria: diagnosis of OSA (based on home sleep study) and subjective daytime sleepiness Exclusion criteria: not reported Baseline Characteristics: 13.8% female. Mean age 51.4 (±8.6). Mean AHI 42.5. Mean ESS 15.7. Mean BMI 36.5 kg/m^2.	• Machine usage • Side effects • Satisfactions	Included in Cochrane review Only 20/36 participants in the intervention group watched the educational video tape. Eight of the 17 defaulters returned machines at different times of the year and had negligible hours of use. Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	SS: Participants provided telephone number for support within office hours. Sleep physician reviewed participants at 1, 6, and 12 months Study duration: 52 weeks			
Mendelson 2014[53] Randomised, parallel-group study. Randomization was stratified by recruitment centre in blocks of 6 participants. Country: France	Participants were randomised to telemedicine (n=54) or standard care (n=53). Standard Care: Evaluated at baseline, fitted with a nasal mask and given an auto titrating machine. Patients were contacted after 2 days to ask about adherence and to troubleshoot. After 4 weeks of treatment, patients met with their sleep specialist and data downloaded from machines. After 4 months of treatment, patients consulted their sleep specialist and were re-evaluated. Telemedicine: In addition to standard care, TM participants were equipped with a smartphone for uploading BP measurements, CPAP adherence, sleepiness, and quality of life data. They received daily pictograms containing health-related messages. Study Duration: 4 months.	N=107 patients with OSA and a high cardiovascular risk (cardiovascular SCORE > 5% or secondary prevention). Inclusion Criteria: Age between 18 and 85 years, diagnosed with OSA on diagnostic sleep study (AHI > 15), BMI of less than 40 kg/m^2, cardiovascular risk SCORE > 5%, or being in secondary prevention with a past history of cardiovascular disease. Exclusion criteria: Central sleep apnoea syndrome cardiovascular score < 5%, cardiac failure, history of hypercapnic chronic respiratory failure, incapacitated patients, pregnancy or taking part in another clinical trial. Baseline Characteristics: 16.8% female. Mean age 63 (±9). Mean AHI=39. Mean ESS=7.9. Mean BMI=29.9 kg/m^2.	• Home self-measured blood pressure (BP) • CPAP usage (hours/night) • Sleepiness (ESS) • QoL (SF-36) All outcomes were measured at 4 months only.	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
Meurice 2007[54] Randomised parallel-group trial. Country: France	Participants were randomised to Intervention Group 1 (n=27), Group 2 (n=27), , Group 3 (n=27) or Group 4 (n=26), defined as follows: Intervention Group 1: RP + RH Intervention Group 2: RP + SH Intervention Group 3: SP + RH Intervention Group 4: SP + SH (Control) Reinforced education by Homecare Network (RH): Home visit by technician at installation and further visits for explanation at one week, one month and two and three months of treatment for repetition of education and problem solving Reinforced education by prescriber (RP): Written material on CPAP use; explanation of OSA and CPAP with side effects; emphasis on importance of compliance with CPAP and detailed demonstration Standard education by the homecare network (SH): Homecare visit to supply the CPAP machine fit the mask and explain the technique of using the apparatus. CPAP mechanism and method of using the machine and mask were explained. Participant was	N=112 participants with severe OSA and no prior treatment for OSA. Inclusion Criteria: PSG-confirmed OSA (AHI > 30), no prior OSA treatment, treated with constant pressure. Exclusion criteria: None reported. Baseline Characteristics: Mean age 58 (±11). Mean AHI=58(±25). Authors reported mean ESS and BMI by intervention arm and reported no significant differences. Gender distribution not reported.	• CPAP usage (hours/night) at 3 months (6 and 12 months data also presented but outside study protocol time period). • Sleepiness (ESS) • Quality of life (SF-36)	Included in Cochrane review Intervention groups 1, 2 and 3 combined for comparison to Control group (4) in Meta-Analysis, as recommended in Cochrane Handbook section 16.5.4. Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	encouraged to ask questions and could phone at any time to resolve problems Standard education by the prescriber (SP): Standard oral explanation of OSA and CPAP, brief demonstration of machine use plus manufacturer's literature. Participant was encouraged to ask questions and clarify misunderstandings. Study duration: 3 months, per protocol. Follow-up to 52 weeks (intervention administered at outset of study). Data extracted at three months. Authors report 'During the remaining 9 months following the initial study design, there was no specific follow-up protocol and patients benefited from the standard homecare surveillance recommended in the ANTADIR network, with a review every 3 months'.			
Munafo 2016[56] Randomised, parallel-group study. Country: USA	Participants were randomised to standard of care (SOC, n=64) alone, or SOC + web-based automated telehealth messaging program (TH, n=58). SOC: Patients were dispensed a CPAP device on Day 0, then contacted via phone on Days 1, 7, 14, 30, and 90. CPAP usage and efficacy data were tracked	N=122 newly diagnosed patients with OSA. Inclusion criteria: Age 18–80 years, CPAP-naïve, confirmed OSA (AHI 5–70) diagnosis based on polysomnography (PSG) or home sleep test, access to and be able to utilize communication technology (text messaging, e-mail).	• CPAP usage (hours/night) at 90 days • Number of adherent participants (Medicare: use for >= 4 h/night on 70 % of nights during a 30 consecutive-day period anytime during first 90 days	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	via the wireless modem attached to CPAP machine. Modem data were accessed via online platform. Frequent phone calls and return clinic visits were provided, as necessary. TH: CPAP device dispensed on Day 0, along with a pamphlet about U-Sleep, a web-based application to monitor adherence and message patients and providers via automated series of text messages/emails were triggered by pre-set conditions. Study Duration: 3 months	Exclusion criteria: prominent central apnoea (>20 %), claustrophobia, current use of mandibular repositioning device, other OSA therapy. Baseline Characteristics: 31% female. Mean age 51.2 (±11.2). Mean AHI=30.4. Mean ESS=10.5. Mean BMI=33.2 kg/m^2.	of initial usage) • Sleepiness (ESS) • Residual AHI All outcomes measured at 90 days.	
Murase 2020[57] RCT Japan	(n=161) Intervention 1: Telemedicine group Physician checked adherence data utilising the telemonitoring system. Follow-every 3 months. (3 months n= 166; 1 month, n=156) Intervention 2: No telemedicine Follow-up 1 month and 3 months	N=508 The criteria for patient inclusion were >18 years old; fulfilled the requirements for CPAP treatment under Japanese governmental health insurance (AHI>20/h by PSG or respiratory event index >40/h by portable monitoring device at OSA diagnosis; CPAP implemented more than 3 months previously; residual AHI under CPAP use<20/h; having clinic visits every month or every 2 months for follow-up of CPAP therapy; recent CPAP adherence data available.	• CPAP use min/night	Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
		Age: telemedicine group: 60 (11); control: 60 (13) years AHI: telemedicine: 40.6; control 40.6 Gender: male%: telemedicine 87%; control 86.1% BMI: telemedicine: 27.4 kg/m^2 (3.8); control: 27 kg/m^2 (5.4) Sleepiness: ESS: telemedicine 5.7 (4.0); 4.9 (2.3)		
Nilius 2019[61] RCT Germany	(n=37) Intervention 1: telemedicine Therapy was uniformly initiated in all eligible patients that is after a positive PSG. Patients were visited by sleep lab staff, and a training session and mask adjustment followed before the initial therapy PSG. The device used was usually an APAP device set to a pressure 4-18 cm H20. The online data for the telemedicine group was anonymously transferred to the password protected web server each morning. The data was evaluated for relevant therapy details each week starting 7 days after the individual discharge date of each patient.	(n=80)Patients who had suffered an ischaemic stroke within last 3 months; a moderate to severe baseline OSA with an AHI>15, that had been confirmed in the sleep laboratory; physical capability to operate a PAP device and mask; age<75;CPAP naïve; no COPD; and regular PAP usage (<3h/night) during the inpatient phase. Age: telemedicine 55.4 (10.4) years; control: 58.6 (9.3) years Gender: all females BMI: telemedicine 31.7 kg/m^2 (5.4); control 30.1 kg/m^2 (6.6); Sleepiness	• Usage hours/night- added to outcome • ESS- end point added to outcome • SF-12 physical • SF-12 mental • Systolic blood pressure • Diastolic blood pressure	Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	(n=38) Intervention 2: No intervention – Standard care All patients went home with a PAP device and the sleep lab informed the homecare provider about the therapy settings and equipment. The patients were advised to visit their primary care physician or lung specialist if they experienced any problem. Follow-up 6 months	ESS: telemedicine 2.4 (3.7); 3.9 (4.9); AHI: 41.2 (19); control: 37.6 (18.4)		
Olsen 2012[62] Randomised parallel-group study Country: Australia	Participants were randomised to motivational interviewing intervention (MINT, n=53) or control (n=53) group. MINT: Motivational interview nurse therapy (MINT) Three sessions of CPAP-specific Motivational Interview Nurse Therapy (MINT) one month apart. Each session lasted approximately 30 minutes. Participants were followed up at two to four weeks by physician and at two months by a nurse. A questionnaire and a machine meter data on adherence were obtained at one, three and 12 months. The manual was initially informed by the Motivational	N = 100 with OSA diagnosed by PSG. Inclusion criteria: OSA confirmed by polysomnography, age ≥ 18, naive to CPAP Exclusion criteria: need for bi-level ventilation, failed to complete CPAP titration, severe depression Baseline Characteristics: 31% female (41.5% intervention, 28.3% control). Mean age 56.6 (±11.0). Mean RDI 34.3. Mean ESS 21.9. Mean BMI 34.5 kg/m$^{2.}$	• CPAP acceptance and adherence • FOSQ • ESS	Included in Cochrane review Severe OSAHS based on mean RDI

Study	Intervention and comparison	Population	Outcomes	Comments
	Enhancement therapy manual developed by Miller and colleagues but with significant modification to increase the relevance to OSA population. As well as receiving general feedback about OSA severity, patients were provided feedback on their own responses to a satisfaction with life scale and apperception of functional severity questionnaire completed at baseline. Sessions 1 and 2 were approximately 30 min in duration (maximum 45 mins), and the booster session was approximately 20 min in length (maximum 30 min). Participants were encouraged to bring along a significant other to the two initial MINT sessions. Nurse training Three nurses with 2-16 years specific sleep medicine training delivered the intervention. The nurses underwent a full day training session with a registered psychologist trained in clinical, health, sleep and neuropsychology. The nurse training session was a structured protocol based on the manual used for this			

Study	Intervention and comparison	Population	Outcomes	Comments
	intervention. The training day was Video recorded. Control: Standard one-on-one 45-minute education session conducted on the day of CPAP titration. Participants were followed up at two to four weeks by physician and at two months by a nurse Study duration: 52 weeks			
Parthasarathy 2012[64] Randomised parallel-group open-label Country: USA	Participants were randomised to usual care (UC, n=17) or peer buddy system (PBS, n=22) group. PBS: Trained peers with OSA and good CPAP adherence record were paired with newly diagnosed participants over three months. During two face-to-face sessions and eight telephone-based conversations, trained peers shared their experiences on coping strategies with CPAP, knowledge of perceived vulnerabilities of untreated OSA, motivated participants and promoted methods for improving efficacy of CPAP UC: CPAP initiation and education class, participants were asked to send CPAP adherence 'smart cards' and were followed up at one and three months	N = 39 veterans with OSA prescribed CPAP. Inclusion criteria: age 21-85, new diagnosis of OSA, AHI > 5, full night or split night polysomnography, no sedative medications used Exclusion criteria: central or complex sleep apnoea, requirement of oxygen or Bi-PAP, unstable medical co-morbidities, irregular lifestyle pattern, excess alcohol use Baseline Characteristics: 0% female. Mean age 52 (±14). Mean AHI 37. Mean ESS 10.8. Mean BMI 34 kg/m^2.	• CPAP adherence • Functional Outcomes of Sleep Questionnaire (FOSQ)	Included in Cochrane review Additional information on study methods and mean CPAP adherence obtained from the study author. These data were available from a pilot study. Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	Study duration: 90 days			
Pengo 2018[65] Randomised, parallel-group study. Country: UK	Participants were randomised to receive, in addition to CPAP therapy, either positively (n=36) or negatively framed (n=37) messages, or standard care (n=39) alone. All patients received 2 weeks of APAP, followed by 4 weeks of fixed CPAP. Standard care: Included explanation of importance of treating OSA, APAP introduction by expert sleep technicians, standard instructions on use of devices, review for troubleshooting, and compliance assessment at 2-weeks post treatment initiation. Positive: Positively framed messages in addition to CPAP. Patients were phoned weekly and read the framed health messages (up to a total of 6 phone calls per patient). Negative: Negatively frames messages in addition to CPAP. Patients were phoned weekly and read the framed health messages (up to a total of 6 phone calls per patient). Study Duration: 6 weeks	N=112 patients who had positive home-based pulse oximeter screen for OSA. Inclusion Criteria: Following at-home screening using nocturnal pulse oximetry, patients who had 4% ODI ≥5 and typical symptoms of sleep apnoea (ESS>10 points), or a 4% ODI > 15 were invited for CPAP treatment. Exclusion Criteria: Mental or physical disability precluding compliance with study protocol, unable to participate in trial follow-up. Baseline Characteristics: 25% female. Mean age 49.1 (±12.1). Mean ODI=24.8. Mean ESS=11.3. Mean BMI=36.5 kg/m^2.	• CPAP usage (hours/night) at 6 weeks. • % Days CPAP used for > 4 hours • Sleepiness (ESS) All outcomes reported at 2 and 6 weeks.	Included in Cochrane review Intervention arms (positively- and negatively balanced messages) combined for comparison to Control arm in Meta-Analysis, as recommended in Cochrane Handbook section 16.5.4. Moderate OSAHS based on mean AHI
Pepin 2019[66] Randomised, multi-centre parallel-	Participants were randomised to usual care (UC, n=149) or multimodal telemonitoring (TM,	N=306 patients with newly-diagnosed OSA. Inclusion Criteria: 18 to 75	• Systolic blood pressure [Author's primary outcome]	Included in Cochrane review Severe OSAHS based on mean

Study	Intervention and comparison	Population	Outcomes	Comments
group study. Country: France	n=157) for 6 months. TM: CPAP-related factors (adherence, leaks, and residual events), BP and physical activity recorded by connected devices. Symptoms and quality of life were recorded via electronic questionnaires completed by patients. Patients received demonstration home telemonitoring use and an explanation of why monitoring these physiological variables was relevant for their care. Automatic algorithms were constructed for the prompt adjustment of CPAP treatment. UC: Received standard care usually received from their assigned sleep centres. Study Duration: 6 months	years, severe OSA (AHI > 30) on the basis of respiratory polygraphy or PSG, at least one cardiovascular disease or exhibit an elevated cardiovascular risk (Systematic Coronary Risk Evaluation risk > 5% at 10 years or in secondary prevention). Exclusion Criteria: Central sleep apnoea, heart failure with a left ventricular ejection fraction < 40%. Baseline Characteristics: 26% female. Median age 61.3 (IQR: 54.1-66.1). Median AHI=46. Median ESS=9. Median BMI=32.0 kg/m^2.	• CPAP usage (hours/night) at 6 months. • Sleepiness (ESS) • QoL (SF-12) All outcomes were reported for 6-month endpoint only.	AHI
Richards 2007[69] Randomised, parallel-group trial Country: Australia	Participants were randomised to treatment as usual (TAU, n=50) or Intervention (n=50) group. Intervention: Cognitive-behavioural therapy. Two one-hour group sessions; slide presentation on sleep, OSA and treatment. CPAP machine on display and relaxation techniques in the event of anxiety caused by wearing CPAP mask Participants also benefited from video presentation with	N = 100 participants with newly-diagnosed OSA referred for CPAP titration. Inclusion criteria: Newly diagnosed with OSA referred for CPAP titration Exclusion criteria: Inability to understand fluent English, previous use of CPAP. Baseline Characteristics: 4% female. Mean age 56. Mean RDI 26.5. Mean ESS 10.5. Mean BMI 30.3 kg/m^2.	• Machine usage	Included in Cochrane review Severe OSAHS based on mean RDI.

Study	Intervention and comparison	Population	Outcomes	Comments
	emphasis on perseverance with treatment and educational pamphlet made available TAU: One standardised group education session; explanation of CPAP titration process; familiarisation with equipment used and procedure to be followed on the titration night. Explanation of side effects, all participants strongly encouraged to contact staff to obtain relevant help and support. Participants assessed and fitted with comfortable mask to be worn during titration Study duration: 28 days			
Roecklein 2010[71] Randomised parallel-group study Country: USA	Participants were randomised to standard education (SE, n=16) or personalized feedback (PF, n=14) group. PF: Written personalised feedback report, including detailed information on severity of the disease, self-reported daytime sleepiness, individually estimated risk of adverse health outcome and risk of motor vehicle accident, all compared with normative data. Feedback addressed barriers to using CPAP, ambivalence about treatment and difficulties of behaviour change and promoted self-efficacy and personal responsibility for	N = 30 patients diagnosed with OSA by PSG, naive to CPAP and reporting intent to use CPAP. Inclusion criteria: age 18 to 65, CPAP naive, reported intent to use CPAP (other sleep, psychiatric or health problems were not exclusion criteria) Exclusion criteria: None reported. Baseline Characteristics: 70% female. Mean age 46.3 (±11.2). Mean AHI 44.4. Mean ESS 11.6. Mean BMI 42.1 kg/m^2.	• Objective CPAP usage (total hours, average hours/night, number of sessions) • Self-reported CPAP usage	Included in Cochrane review Participants were not provided machines but obtained them 'naturalistically', most commonly through insurance. Most participants were low-income African Americans. Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	choosing to use CPAP SE (control): Written information from the American Academy of Sleep Medicine on OSA, Snoring and PAP therapy for OSA Study duration: 3 months			
Sarac 2017[72] Randomised, parallel-group study. Country: Turkey	Participants were randomised to receive standard support (SS, n=63) or educational support (ES, n=52). SS: General explanation (~10-15 min) of OSA and PAP. ES: SS + additional education (~ 20 min) by a sleep medicine physician , including: viewing his/her own polysomnography chart on morning post PAP-titration, comparing the PSG from diagnostic and CPAP titration studies with explanations that emphasized obstructive events and oxygen desaturations, and the disappearance of those signs on PAP treatment. Study Duration: Approximately 6 months	N=115 patients with OSA. Inclusion criteria (not explicit): ≥18 years old), newly diagnosed OSA (AHI ≥5), free from upper airway obstructions. Exclusion criteria (not explicit): Not interested in PAP or in study participation, living outside Istanbul, unable to come to follow-up. Baseline Characteristics: 24.5% female. Mean age 51 (±9.3). Mean AHI=41.4. Mean ESS=10.0. Mean BMI=32.5 kg/m^2.	• CPAP usage (hours/night) at 5 time points, participants invited to return at 15, 30, 60, 90- and 180-days post-randomisation (actual time of measurements varied by participant) • Number of adherent participants (usage ≥ 4 h per night on at least 70% of nights) at short-term (first) and long-term (last) follow-up • Sleepiness (ESS)	Included in Cochrane review 58 out of 63 patients in the SS group, and 49 out of 52 patients in the ES group completed the five follow-up appointments during the study period. The median time from randomization to first follow-up was 20 days for both groups with an IQR 17–27 days for the SS group, and 16–26 days for the ES group (p=0.89). The median time to last follow-up was 187 days (IQR 170-202 days) in the SS group, and 184 days (IQR 173–198 days) in the ES group (p=0.16). Severe OSAHS based on mean AHI
Sawyer 2017[73] Randomised, parallel-group study. Country: USA	Participants were randomised to receive usual care (UC, n=57) or a multi-phased and tailored intervention (TI, n=61) targeting social cognitive perceptions of OSA–PAP treatment.	N=118 adults with newly diagnosed OSA Any adult patient referred for a diagnostic PSG was invited to participate in the study. Inclusion Criteria: newly diagnosed with OSA (AHI >	• CPAP usage (hours/night) at 1 week, 1 month and 3 months. • Number of adherent participants (usage ≥ 4 h per night) at 1	Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	TI: Intervention addressed cognitive perceptions of the diagnosis and treatment, outcome expectancies with PAP treatment, and PAP treatment self-efficacy, all domains of SCT. Intervention delivered in four phases: pre-diagnosis, post diagnosis (i.e., post diagnostic polysomnogram), immediately post-PAP titration polysomnogram, and with week 1 of home PAP treatment. Intervention delivery guided by a protocol and script templates for specific exposure phases to minimize a potential interventionist effect. UC: Followed current practice standards for the diagnosis and treatment of OSA in adults (Epstein et al., 2009; Kushida et al., 2006). Included sleep centre–provided informational brochures about OSA, diagnostic testing, and PAP prescription. In addition, access by telephone to sleep centre staff for problems, questions, or concerns was provided during daytime and evening. Study Duration: 3 months	10), PAP-naive, ≥18 years of age, able to read and speak English. Exclusion criteria: previous diagnosis or treatment of OSA; medical record documented new psychiatric diagnosis within previous six months of study enrolment; requirement of supplemental oxygen or bi-level PAP identified on PAP titration PSG suggesting diagnosis other than OSA; diagnosis of another sleep disorder in addition to OSA based on polysomnogram (i.e., periodic limb movement disorder [≥10 limb movements/hr of sleep with arousal], central sleep apnoea [≥5/hr central apnoea's], insomnia, sleep hypoventilation syndrome, or narcolepsy). Baseline Characteristics (per-protocol): 30% female. Mean age 51.3 (±11.1). Mean AHI=36. Mean ESS=19.6. Mean BMI=38.0 kg/m^2.	week, 1 month and 3 months.	
Scala 2012[74] Randomised, parallel-group	Participants were randomised to standard care (SC, N=15) or an educational intervention	N=28 patients with newly-diagnosed OSAS. Inclusion Criteria: Newly-	• CPAP usage (hours/night) at 6 months (12-month	Included in Cochrane review

Study	Intervention and comparison	Population	Outcomes	Comments
study. *** FULL INFORMATION PENDING TRANSLATED FULL TEXT *** Country: Italy	(EDU, N=13). EDU: 3 interactive sessions, video with discussion, focus group and role play, respectively 1, 2 and 3 months after receiving the CPAP device. Study Duration: 6 months	diagnosed, OSAS. Exclusion criteria: Not reported. Baseline Characteristics: 75.3% female. Mean age 57 (±11.2). Mean AHI NR. Mean ESS 12.6. Mean BMI NR.	results pending at time of report) • Sleepiness (ESS) • QoL (SF-36) Outcomes measured at 6 months.	
Sedkaoui 2015[77] Randomised, parallel-group study. Country: France	Participants were randomised to standard support (SS, n=190) or coached support (CS, n=189). SS: Received information from their physician about modalities and usefulness of CPAP treatment. Technician performed CPAP set-up at participant's home, re-explained the device's function, and checked for mask fit and adaptation. Follow-up performed at 1 month and 4 months to assess CPAP parameters. CS: In addition to SS, participants in CS received standardized support completed through 5 sessions (day 3 , 10, 30, 60, and 90) via telephone-base counselling. Session 1 objective was to assess patient's knowledge about the disease, device and health consequences; to emphasises importance of good adherence; to encourage	N=379 with newly diagnosed SAHS Inclusion Criteria: OSAHS, prescribed CPAP, AHI ≥ 30 or AHI < 30 and > 10 arousals/hour, French fluency. Exclusion criteria: Age <18 years, under guardianship, previous CPAP use, psychiatric illness, participating in another clinical trial Baseline Characteristics: 72.0% female. Mean age 63. Mean AHI 42.2. Mean ESS 11.6. Mean BMI 40 kg/m^2.	• CPAP usage (hours/night) at 4 months • Number of adherent participants (usage ≥ 3 h per night) at 4 months	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	CPAP use throughout sleep every day. Objectives of the other educational sessions were to identify disadvantages or obstacles CPAP treatment and then focus on the benefits linked to use of CPAP. A particular effort was made to discuss misconceptions about sleep apnoea and barriers to use, concerns fears and beliefs, as well as the perceptions of their partners and family, in order to increase patients' positive expectations regarding CPAP benefits. Study Duration: 4 months			
Shapiro 2017[78] Randomised parallel-group trial Country: USA	Participants were randomised to standard care (SC, n=33) or CPAP-SAVER Intervention (CI, n=33). SC: Basic OSA and CPAP teaching and follow-up provided by respiratory therapist/CPAP education employed by home medical supplier. CI: Standard care plus airway model, video education sheet, report card components, support calls.	N=46 newly-diagnosed with OSA and prescribed CPAP for the first time. Inclusion criteria: >= 18 years; newly-diagnosed by PSG; commencing CPAP for first time; able to read/speak/understand/write English; CPAP with smart card technology Exclusion criteria: requires BiPAP, significant craniofacial abnormalities, Downs syndrome, cognitive delay, hypertonia, neuromuscular degenerative disorder, taking anti-anxiety medication, pregnant. Baseline Characteristics:	• CPAP usage (hours/night) at 1 month	Included in Cochrane review Moderate OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
		45.5% female, Mean age 51.8 (13.1). Mean AHI 26.2. Mean ESS NR. Mean BMI 35.7kg/m^2.		
Smith 2006[82] Randomised parallel-group trial Country: USA	Participants were randomised to control (n=9) or intervention (n=10) group. Intervention: Two-way telehealth sessions mediated by video link-up through phone line. Research nurse emphasised nightly, bedtime routine for CPAP. After standardised protocols, nurse visually assessed participant, guided correct CPAP routine and determined whether the CPAP mask fits properly. Nurse described consequences of non-adherence and managing barriers to CPAP use. Benefits of nightly CPAP use for general health were emphasised Control: Two-way telehealth sessions mediated by video link-up through phone line. Protocols drawn up to mimic content delivered to intervention group. Instead of CPAP-related information, participants given content on vitamin intake Study duration: 12 weeks	N = 19 with newly-diagnosed OSA, non-adherent with CPAP for 3 months Inclusion criteria: New OSA diagnosis, first CPAP prescription, received initial education on CPAP use and supplemental audiotaped/videotaped reinforcement at two and four weeks, non-adherent with CPAP for 3 months Exclusion criteria (unclear if a priori): positive screen for drug or alcohol abuse, depression requiring hospitalization Baseline Characteristics: % female NR. Mean age 63 (±8). Mean AHI NR. Mean ESS NR. Mean BMI NR.	• Number of adherent participants (usage ≥ 4 hrs/night on ≥ 9 of 14 nights) at 12 weeks	Included in Cochrane review Non-adherence in the study defined as less than four hours of CPAP use per night for fewer than nine of 14 consecutive nights' use TJL emailed for details of randomisation and outcome data 12/09/2008. Carol Smith responded 15/09/2008. For updated review, further email communication was required to verify that updated inclusion criteria were met, confirmation received from Carol Smith, 27mar2019.
Smith 2009[81] Randomised parallel-group trial	Participants were randomised to control (n=42) or CPAP Habit Intervention (Intervention,	N = 97 patients with newly-diagnosed OSA. Mean age: 63.4, Male sex:	• Number of participants adhering to CPAP (≥ 4	Included in Cochrane review

Study	Intervention and comparison	Population	Outcomes	Comments
Country: USA	n=55) group. All participants received usual education on OSA and demonstration of CPAP equipment Intervention: The Habit-Promoting Experimental Audio Intervention: CPAP Every Day —The CPAP intervention packet called, “Get in the Habit of CPAP Every Day,” included audiotaped music along with softly-spoken directions for using CPAP nightly. The sleep inducing audio music entitled, “Building a Routine for Sleep Time.” The audio music guided patients in preparing the CPAP machine at bedtime and in creating a relaxing environment in congruence with music and lyrics. The 20-minute audio provides instructions for putting on the CPAP mask comfortably, correctly connecting air hoses and relaxing despite the ventilation equipment positive air pressure and noise. The audio first instructs the patient to practice breathing in deeply and then exhaling slowly for relaxation. Next, the patient is guided to relax his or her muscles slowly from toes to head, using repeated reminders for slow, deep breathing and spoken images of long restful sleep	55%, Mean AHI: Intervention group: 52.3, Control group: 47.3 Inclusion criteria: new diagnosis of OSA, age ≥ 18, AHI ≥ 20 Exclusion criteria (unclear if a priori): positive screen for drug or alcohol abuse, depression requiring hospitalization Baseline Characteristics: 45% female. Mean age 63. Mean AHI 50.1. Mean ESS NR. Mean BMI NR.	hours/day and ≥ 9 of 14 nights) at 1, 3 and 6 months	Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	(e.g., “feel the gentle air pressure slowly filling your lungs”) to sensitize patients to CPAP benefits. The gradually decreasing music tempo induces relaxation by slowly reducing the rhythms to a typical resting heart rate cadence. The intervention packet had informational handout sheets, CPAP use reminder placards and a 4-week diary for recording CPAP use. The diaries have pages for recording audio use and writing about their experiences with CPAP. Handouts in the packet list the health consequences of not using CPAP, such as the high risk of stroke and heart attack, falling asleep while driving, poor functioning on work activities due to sleepiness, or missing out on social activities due to fatigue or tiredness and an audio disc, including music that relaxes patients into sleep. Materials also provided information about benefits of adherence (increased alertness, energy for activities, less irritability). Thus, the intervention integrated CPAP benefit and non-use risk information, music relaxation			

Study	Intervention and comparison	Population	Outcomes	Comments
	and habit-promoting instructions as a guide to routine nightly use of CPAP]. Control: Audiotaped music along with spoken information about vitamins. Information packet was the same in format and length as the intervention group, but content was on vitamins Study duration: 6 months			
Soares-Pires 2013[83] Randomised, parallel-group study. Country: Portugal	Education group: Participants were assigned to a single group education session one month after beginning APAP therapy. Sessions were conducted by a pulmonologist, a psychologist, and a respiratory physiotherapist. Sessions included information regarding OSAHS, its symptoms and risks, APAP treatment, the importance of good adherence, and different machine interfaces. Patients were invited to share their experience on the use of APAP, and each patient's adherence reports were analysed and discussed. Patients; concerns, fears, and beliefs were also addressed. Standard Care: The sleep physician provided a brief explanation of the disease to patients of both groups, as well	N=202 patients with OSAHS. Inclusion criteria: AHI ≥15 or ≥5 events per hour plus symptoms that included unintentional sleep episodes while awake, daytime sleepiness, unrefreshing sleep, fatigue, insomnia, gasping or choking, or loud snoring and/or apnoea described by the patient's bed partner. Exclusion criteria: lung disease, obesity hypoventilation syndrome, restrictive ventilatory syndromes, long-term oxygen therapy, Cheyne–Stokes breathing pattern, central apnoea, cognitive disability. Baseline Characteristics: 29.5% female. Median age 58.5. Median AHI 38. Median ESS 12. Median BMI 32	• CPAP usage (hours/night) at 6 months. • Number of adherent participants (usage > 4 h/night for ≥ 70% days	Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	as informed patients of the need for APAP treatment, its benefits and function mode. None of the patients had previously received any form of PAP therapy. Approximately 3–5 days after the prescription, technicians from the PAP systems delivery companies performed a home visit to drop the APAP device. In this visit, an explanation on how to turn on and off the machine and on the placement of the interface was provided to all patients. Study Duration: 6 months	kg/m^2.		
Sparrow 2010[84] Randomised parallel-group trial Country: USA	Participants were randomised to control (n=126) or interactive voice response system, TLC-CPAP (TLC-CPAP, n=124) group. TLC-CPAP: (telephone-linked communications for CPAP (TLC-CPAP), (n=124) The TLC-CPAP was designed around the concepts of motivational interviewing, a patient-centred approach to increase motivation to engage in a health behaviour by addressing the themes of perceived importance of using CPAP and confidence to adhere to CPAP. The TLC-CPAP system was automated	N = 250 patients undergoing initial set-up of fixed-pressure CPAP or BiPAP. Inclusion criteria: Age 18 to 80 years, AHI > 10 Exclusion criteria: Not reported Baseline Characteristics: 18% female. Median age 55. Median AHI 38.3. Median ESS 10.5. Median BMI 35.1 kg/m^2.	• Machine usage (data downloaded from memory cards or by direct interrogation of CPAP devices) at 6and 12 months. • Number of adherent participants (usage > 4 h per night) .	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	and adapted from the intervention described by Aloia et al as Motivational Enhancement for CPAP. TLC-CPAP uses digitised human speech to speak to the patients and the patients communicate via the touch-tone keypad of their telephones. The TLC-CPAP content includes assessment of the patient's perceptions about and experiences with OSAS and CPAP therapy and the patient's reported CPAP use (hours per night and nights per week) during the week preceding each call; assessment of the patient's goals with regard to OSAS therapy; and feedback and counselling to enhance motivation to use CPAP and address barriers and poor self-efficacy. Participants were required to make weekly calls to TLC-CPAP during the first month beginning 3 days after starting CPAP therapy and thereafter monthly for the 12-month duration of the study. The computer system called the participants if they did not make a call at the expected times (some grace time was allowed).			

Study	Intervention and comparison	Population	Outcomes	Comments
	Control: Attention placebo control' group received general education on a variety of health topics via a telephone-linked communication (TLC) system. Participants were required to make calls on the same schedule as the intervention group Study duration: 12 months			
Stepnowsky 2007[86] Randomised parallel-group trial Country: USA	Participants were randomised to usual care (UC, n=24) or telemonitoring (TM, n=21) group. TM: Review of compliance and efficacy data. Monitored information garnered as objective compliance data and subjective reports of usage. Follow-up tailored to how CPAP used by participants. Details on how many total hours the PAP unit was used each night at therapeutic pressure. Efficacy data consisted of the amount of mask leakage (L/s) and the AHI (total number of apnoea/apnoea's and hypopnoeas per hour of sleep) UC: Telephone call from staff one week after CPAP initiation and office follow-up visit at one month. Participants encouraged to call clinic any time with problems or	N = 45 patients newly-diagnosed with OSA. Inclusion criteria: AHI ≥ 15, no prior CPAP treatment, stable sleep environment Exclusion criteria: allergies/sensitivity to mask or mask material, previous use of any other PAP device (e.g. bi-level PAP, auto-adjusting PAP), current use of prescribed supplemental oxygen or significant comorbid medical conditions that could interfere with daily use of CPAP Baseline Characteristics: 2% female. Mean age 59 (±14.3). Mean AHI 39. Mean ESS 12.6. Mean BMI 32.8 kg/m^2.	• CPAP usage (hours/night) • % nights with CPAP use > 4 hours • Sleepiness (ESS) • QoL (FOSQ) • AHI All outcomes reported at 2 months.	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	concerns Study duration: 2 months			
Stepnowsky 2013[85] Randomised parallel-group trial Country: USA	Participants were randomised to telemonitoring (TM, n=126) usual care (UC, n=115) group. TM: Main goals of MyCPAP intervention were to (a) allow both the patient and provider access to tele monitored adherence and efficacy data on a daily basis, (b) act on that data collaboratively to guide CPAP management and troubleshoot problems early and effectively, and (c) emphasize ways for the patient to express their preferences and needs UC: Diagnostic sleep study, CPAP instruction and setup by trained health care provider, and follow-up at predetermined times (1-week, 1 month) by CPAP clinic staff. Beyond these pre-determined clinic contacts, patients were encouraged to call whenever they had a problem or concern. Study Duration: 4 months	N=241 patients with a recent OSA diagnosis and prescription for CPAP therapy. Inclusion criteria: Diagnosis of OSA (apnoea-hypopnea index ≥ 15), CPAP therapy prescription, and age ≥ 18 years. Exclusion criteria: residence in a geographical area outside of San Diego County, fatal comorbidity (life expectancy less than 6 months as indicated by physician); or significant documented substance/chemical abuse. Baseline Characteristics: % female NR (may be all male veterans). Mean age 52.1 (±13.3). Mean AHI 36.5. Mean ESS 10.6. Mean BMI 32.5 kg/m^2.	• CPAP usage (hours/night) Sleepiness (ESS) • QoL (SAQLI) Outcomes were reported at 2 and 4 months.	Included in Cochrane review Severe OSAHS based on mean AHI
Turino 2017[92] Prospective randomised controlled trial. Country: Spain	Participants were randomised to standard management (SM, n=48) or a telemonitoring programme (TM, n=52) TM: Each CPAP device equipped with mobile 2G	N=100 newly diagnosed OSA patients Inclusion criteria: >18 years, newly diagnosed OSA requiring treatment with CPAP (AHI >15).	• Machine usage (hours/night) at 1 month, 3 months • QoL (EQ-5D) • Blood pressure	Included in Cochrane review Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	technology capable of sending daily information on CPAP adherence, CPAP pressures, mask leak and residual respiratory events to the web database. Automatic alarms for the provider were generated in case of mask leak >30 L/min for >30% of the night or usage of <4 h/night on two consecutive nights. In case of alarm, the pulmonary specialist medical officer of the CPAP provider contacted the patient, providing case-by-case problem solving. SM: Patients were fitted with a mask and given a CPAP device and a leaflet explaining how to use it. A short instruction session on CPAP device use was provided to patients and partners in the sleep unit by a trained nurse. This included a practical demonstration of how to put on the mask, and the correct management and cleaning of the tubes, masks and humidifier. Information on how to turn the CPAP device on and off was provided by the homecare provider at the time of machine delivery. All patients were visited after 1 month of treatment by the nurse at the sleep unit.	Exclusion criteria: Impaired lung function (COPD-OSAHS overlap syndrome, obesity hypoventilation and restrictive disorders), severe heart failure, psychiatric disorders, periodic leg movements, pregnancy, other dyssomnias or parasomnias, history of previous CPAP treatment. Baseline Characteristics: 23% female. Mean age 55 (NR). Mean AHI 52. Mean ESS NR. Mean BMI 35 kg/m^2.		

Study	Intervention and comparison	Population	Outcomes	Comments
Wang 2012[95] Randomised parallel-group study. Country: China	Participants were randomised to one of four arms: PMR+EDU (n=38), EDU (n=38), PMR (n=38), Control (n=38). Education (EDU only): Three nights of CPAP titration in the first week, four-hour group education session on OSA and CPAP in the first week, participants were given a brochure describing benefits of CPAP and CD containing a 20-minute video demonstrating how to optimise CPAP treatment, 24-hour consultation telephone line to the sleep nurses was available Progressive Muscle Relaxation Training (PMR only): One night of CPAP titration in the hospital, 12 × 40-minute group Progressive Muscle Relaxation (PMR) practice sessions over 12 weeks, one per week. Self-practice of PMR before each CPAP treatment. Brochure and CD with a guide for PMR practice at home. EDU + PMR: Three nights of CPAP titration in the hospital. Combination of interventions as in Education and PMR group (see above) Control: One night of CPAP titration in the hospital in the first week	N=152 participants with a new OSA diagnosis. Inclusion criteria: new OSA diagnosis, AHI ≥ 10, above elementary school education, 'conscious mind and able to communicate clearly' Exclusion criteria: personal or family history of mental illness, drug or alcohol abuse, severe cognitive impairment, 'concurrent oncologic or psychiatric diseases' Baseline Characteristics: 6.8% female. Mean age NR. Mean AHI 43.1. Mean ESS=14.1. Mean BMI NR. Authors did not report mean age for full sample or by intervention arm (reported only distribution Ns per (4) age groups for each arm). Also did not report average BMI for full sample or by intervention arm (reported only distribution Ns per (4) BMI groups for each arm).	• CPAP usage (hours/night) at 4, 8 and 12weeks • Number of adherent participants (≥ 4 hours/night and at least 9 of 14 nights ventilator use) at 4, 8 and 12 weeks of intervention • Sleepiness (ESS) • QoL .	Included in Cochrane review Trialists included three intervention arms. One arm was Educational (EDU), one was Behavioural (PMR) and the third was Mixed (EDU+PRM). These were compared to control in respective meta-analyses (i.e., Educational, Behavioural, Mixed). Severe OSAHS based on mean AHI

Study	Intervention and comparison	Population	Outcomes	Comments
	Study duration: 12 weeks			

See appendix D for full evidence tables.

1.4.4 Quality assessment of clinical studies included in the evidence review

Table 3: Clinical evidence summary: Behavioural therapy + CPAP versus control + CPAP- Severe OSAHS

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Behavioural therapy + CPAP versus control + CPAP (95% CI)
CPAP Device Usage (hours/night) Higher is better	577 (8 studies)	⊕⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, imprecision, indirectness		The mean CPAP device usage (hours/night) in the control groups was 3.32	The mean CPAP device usage (hours/night) in the intervention groups was 1.31 higher (0.95 to 1.66 higher)
N deemed adherent (≥ four hours/night) Higher is better	549 (6 studies)	⊕⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, imprecision, indirectness	RR 1.33 (1.1 to 1.61)	Moderate	
				408 per 1000	135 more per 1000 (from 41 more to 249 more)
Withdrawal	939 (10 studies)	⊕⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, imprecision, indirectness	RR 0.7 (0.51 to 0.98)	Moderate	
				81 per 1000	24 fewer per 1000 (from 2 fewer to 40 fewer)
Epworth Sleepiness Scale (Endpoint scores) Lower is better	371 (6 studies)	⊕⊖⊖⊖ VERY LOW[1,3,4] due to risk of bias, inconsistency, indirectness		The mean ESS in the control groups was 9.0	The mean epworth sleepiness scale in the intervention groups was 2.22 lower* (3.68 to 0.75 lower)
AHI on treatment – Endpoint Lower is better	89 (2 studies)	⊕⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, imprecision, indirectness		The mean AHI in the control group was 4	The mean ahi on treatment in the intervention groups was 0.95 lower (2.25 lower to 0.35 higher)
Quality of Life - Comparison of Values at Endpoint - QoL: FOSQ – Endpoint Higher is better	200 (2 studies)	⊕⊕⊖⊖ LOW[1,4] due to risk of bias,		The mean quality of life - comparison of values at endpoint -	The mean quality of life - comparison of values at endpoint - QOL: FOSQ - endpoint in the intervention groups

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Behavioural therapy + CPAP versus control + CPAP (95% CI)
		indirectness		QOL: FOSQ - endpoint in the control groups was 10.6	was 0 higher (0.15 lower to 0.16 higher)
Quality of Life - Comparison of Values at Endpoint - QoL: SF-36 (PH) – Endpoint Scale from 0-100 Higher is better	28 (1 study)	⨁⨁⊖⊖ LOW[1,4] due to risk of bias, indirectness		The mean quality of life - comparison of values at endpoint - QOL: sf-36 (ph) - endpoint in the control groups was 78.1	The mean quality of life - comparison of values at endpoint - QOL: sf-36 (ph) - endpoint in the intervention groups was 1.1 lower (11.46 lower to 9.26 higher)
Mortality (critical outcome)	-	-	-	-	Not reported

1 Downgraded by 1 increment if the majority of the evidence was at high risk of bias and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
2 Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5;SAQLI - 2 . GRADE default MID (0.5XSD) used for all continuous other outcomes.

3 Downgraded by 1 or 2 increments for heterogeneity, unexplained by subgroup analysis. Random effect analysis used.
4 Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively

*Not sleepy in both groups

Table 4: Clinical evidence summary: Educational interventions + CPAP versus usual care + CPAP- Severe OSAHS

Outcomes	No of	Quality of the	Relative	Anticipated absolute effects

	Participants (studies) Follow up	evidence (GRADE)	effect (95% CI)	Risk with Control	Risk difference with Educational interventions + CPAP versus usual care + CPAP (95% CI)
CPAP Device Usage (hours/night) Higher is better	1128 (10 studies)	⨁⨀⨀⨀ VERY LOW[1,2,3,4] due to risk of bias, inconsistency, imprecision, indirectness		The mean CPAP device usage (hours/night) in the control group was 3.5	The mean CPAP device usage (hours/night) in the intervention groups was 0.88 higher (0.4 to 1.36 higher)
N deemed adherent (≥ four hours/night) Higher is better	1019 (7 studies)	⨁⨁⨀⨀ VERY LOW[1,3,4] due to risk of bias, imprecision, indirectness	RR 1.31 (1.15 to 1.48)	Moderate	
				547 per 1000	170 more per 1000 (from 82 more to 263 more)
Withdrawal	1745 (9 studies)	⨁⨁⨀⨀ LOW [1,4] due to risk of bias, indirectness	RR 0.73 (0.52 to 1.02)	Moderate	
				150 per 1000	41 fewer per 1000 (from 72 fewer to 3 more)
Epworth Sleepiness Scale - Comparison of Values at Endpoint- Scale from 0-24 Higher is worse	355 (3 studies)	⨁⨀⨀⨀ VERY LOW[1,3,4] due to risk of bias, imprecision, indirectness		The mean ESS in the control group was 6.41	The mean epworth sleepiness scale scores in the intervention groups was 0.08 lower * (0.92 lower to 0.76 higher)
Mortality (critical outcome)	-	-	-	-	Not reported

1 Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
2 Downgraded by 1 or 2 increments for heterogeneity, unexplained by subgroup analysis. Random effect analysis used.
3 Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5;SAQLI – 2. GRADE default MID (0.5XSD) used for all other continuous outcomes.
4Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively
*Not sleepy in both groups

Table 5: Clinical evidence summary: Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP - Severe OSAHS

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP (95% CI)
CPAP Device Usage (hours/night) Higher is better	1501 (14 studies)	⨁⨀⨀⨀ VERY LOW[1,2,3] due to risk of bias, inconsistency, imprecision		The mean CPAP device usage (hours/night) in the control group was 3.6	The mean CPAP device usage (hours/night) in the intervention groups was 0.83 higher (0.45 to 1.22 higher)
Days PAP used >4 hours at 12 months Higher is better	23 (1 study)	⨁⨁⨀⨀ LOW[2] due to imprecision		The mean days pap used >4 hours in the control group was 282 days	The mean days pap used >4 hours at 12 months in the intervention groups was 11 lower (75.76 lower to 53.76 higher)
Days PAP used >4 hours at 3 months Higher is better	294 (2 studies) 3 months	⨁⨁⨁⨁ HIGH		The mean days pap used >4 hours in the control group was 65.8 days	The mean days pap used >4 hours at 3 months in the intervention groups was 8.06 higher (1.80 to 14.33 higher)
Mean adherence all days (min per day) at 12 months Higher is better	23 (1 study)	⨁⨁⨁⨀ MODERATE[2] due to imprecision		The mean adherence all days (min per day) at 12 months in the control group was 307	The mean adherence all days (min per day) at 12 months in the intervention groups was 45 higher (20.99 lower to 110.99 higher)
CPAP use min/night Higher is better	327 (1 study)	⨁⨁⨁⨁ HIGH		The mean CPAP use min/night in the control groups was	The mean CPAP use min/night in the intervention groups was 20 higher

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP (95% CI)
				307	(1.51 lower to 41.51 higher)
N deemed adherent (≥ four hours/night)	376 (2 studies)	⨁⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, imprecision, indirectness	RR 1.19 (1.03 to 1.37)	Moderate	
				635 per 1000	121 more per 1000 (from 19 more to 235 more)
Withdrawals	1702 (11 studies)	⨁⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, imprecision, indirectness	RR 1.22 (0.97 to 1.52)	Moderate	
				118 per 1000	26 more per 1000 (from 4 fewer to 61 more)
Epworth Sleepiness Scale - Comparison Endpoint or Change from Baseline Values - ESS: Endpoint Scores Scale from 0-24 Lower is better	1527 (15 studies)	⨁⨁⊖⊖ LOW[1,3] due to risk of bias, inconsistency		The mean epworth sleepiness scale - in the control groups was 3.16	The mean epworth sleepiness scale - comparison endpoint or change from baseline values - ESS: endpoint scores in the intervention groups was 0.28 lower (0.73 lower to 0.16 higher)
Quality of Life: Comparison of Values at Endpoint - QoL: FOSQ – Endpoint Scale from 5-20 Higher is better	109 (3 studies)	⨁⨁⊖⊖ LOW[1,4] due to risk of bias, indirectness		The mean quality of life: FOSQ - in the control groups was 16.1	The mean quality of life: comparison of values at endpoint - QOL: FOSQ - endpoint in the intervention groups was 0.55 higher (0.81 lower to 1.9 higher)
Quality of Life: Comparison of Values at Endpoint - QoL: SAQLI – Endpoint Higher is better	240 (1 study)	⨁⨁⊖⊖ LOW[1,4] due to risk of bias, indirectness		The mean quality of life: SAQLI in the control groups was 4.6	The mean quality of life: comparison of values at endpoint - QOL: SAQLI - endpoint in the intervention groups was 0.5 higher

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP (95% CI)
					(0.09 lower to 1.09 higher)
Quality of Life: Comparison of Values at Endpoint - QoL: SF-36 (PH) – Endpoint Scale from 0-100 Higher is better	334 (3 studies)	⨁⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, indirectness, imprecision		The mean quality of life: sf-36 (ph) - in the control groups was 46	The mean quality of life: comparison of values at endpoint - QOL: sf-36 (ph) - endpoint in the intervention groups was 1.09 higher (0.34 lower to 2.52 higher)
Quality of Life: Comparison of Change from Baseline Values - QoL: FOSQ - Change from Baseline Higher is better	39 (1 study)	⨁⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, indirectness, imprecision		The mean quality of life: FOSQ - in the control groups was 1.1	The mean quality of life: comparison of change from baseline values - QOL: FOSQ - change from baseline in the intervention groups was 0.8 higher (1.25 lower to 2.85 higher)
Quality of Life: Comparison of Change from Baseline Values - QoL: SF-36 (PH) - Change from Baseline Higher is better	82 (1 study)	⨁⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, indirectness, imprecision		The mean quality of life: sf-36 (ph) - in the control groups was 2.9	The mean quality of life: comparison of change from baseline values - QOL: sf-36 (ph) - change from baseline in the intervention groups was 0.3 higher (3.1 lower to 3.7 higher)
Quality of Life: Comparison of Change from Baseline Values - QoL: FOSQ-10 - Change from Baseline Higher is better	173 (1 study)	⨁⊖⊖⊖ VERY LOW[1,2,4] due to risk of bias, indirectness, imprecision		The mean quality of life: fosq-10 - in the control groups was -14.2	The mean quality of life: comparison of change from baseline values - QOL: fosq-10 - change from baseline in the intervention groups was 3.3 higher (0.1 to 6.5 higher)

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP (95% CI)
diastolic blood pressure	55 (1 study)	⨁⨁⨁⊖ MODERATE[2] due imprecision		The mean diastolic blood pressure in the control groups was 82.8	The mean diastolic blood pressure in the intervention groups was 4.4 lower (9.82 lower to 1.02 higher)
systolic blood pressure	55 (1 study)	⨁⨁⨁⊖ MODERATE,[2] due imprecision		The mean systolic blood pressure in the control groups was 138.8	The mean systolic blood pressure in the intervention groups was 9.3 lower (17.57 to 1.03 lower)
AHI on treatment - Comparison of Values at Endpoint Lower is better	411 (5 studies)	⨁⊖⊖⊖ VERY LOW[1,2,3] due to risk of bias, inconsistency, imprecision		The mean ahi on treatment performed in control group was 4.2	The mean ahi on treatment performed in the intervention groups was 0.80 higher (0.66 lower to 2.25 higher)
Mortality (critical outcome)					Not reported

1 Downgraded by 1 increment if the majority of the evidence was at high risk of bias and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
2 Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5;SAQLI – 2. GRADE default MID (0.5XSD) used for all other continuous outcomes.
3 Downgraded by 1 or 2 increments for heterogeneity,unexplained by subgroup analysis. Random effect analysis used.

4Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively
*Not sleepy in both groups

Table 5: Clinical evidence summary: Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP - Severe OSAHS

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP (95% CI)
CPAP Device Usage (hours/night) Higher is better	4451 (10 studies)	⨁⊖⊖⊖ VERY LOW[1,2,3,4] due to risk of bias, inconsistency, imprecision, indirectness		The mean CPAP device usage (hours/night) in the control group was 4.8	The mean CPAP device usage (hours/night) in the intervention groups was 0.82 higher (0.2 to 1.43 higher)
N deemed adherent (≥ four hours/night) Higher is better	4015 (9 studies)	⨁⊖⊖⊖ VERY LOW[1,3,2,4] due to risk of bias, inconsistency, imprecision indirectness	RR 1.14 (1.04 to 1.26)	Moderate 656 per 1000	92 more per 1000 (from 26 more to 171 more)
Withdrawal	4956 (11 studies)	⨁⊖⊖⊖ VERY LOW[1,3,2,4] due to risk of bias, inconsistency, imprecision, indirectness	RR 0.64 (0.32 to 1.28)	Moderate 136 per 1000	49 fewer per 1000 (from 92 fewer to 38 more)
Quality of Life: Comparison of Change from Baseline Values - QoL: FOSQ-10 - Change from Baseline Higher is better	176 (1 study)	⨁⊖⊖⊖ VERY LOW[1,3,4] due to risk of bias, indirectness, imprecision		The mean quality of life: fosq-10 - in the control groups was -14.2	The mean quality of life: comparison of change from baseline values - QOL: FOSQ-10 - change from baseline in the intervention groups was 2.9 higher (0.52 lower to 6.32 higher)
Quality of Life: Comparison of Change	2836	⨁⊖⊖⊖		The mean quality of	The mean quality of life: comparison

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP (95% CI)
from Baseline Values - QoL: SF-36 (PH) - Change from Baseline Higher is better	(1 study)	LOW[1,4] due to risk of bias, indirectness		life: sf-36 (ph) - in the control groups was 5.9	of change from baseline values - QOL: sf-36 (ph) - change from baseline in the intervention groups was 5.7 higher (4.98 to 6.42 higher)
Quality of Life: Comparison of Values at Endpoint - QoL: FOSQ – Endpoint Scale from 5-20 Higher is better	177 (1 study)	⨁⊖⊖⊖ LOW[1,4] due to risk of bias, indirectness		The mean quality of life: FOSQ - in the control groups was 16.7	The mean quality of life: comparison of values at endpoint - QOL: FOSQ - endpoint in the intervention groups was 0.3 higher (0.56 lower to 1.16 higher)
Quality of Life: Comparison of Values at Endpoint - QoL: SF-36 (PH) – Endpoint Scale from 0-100 Higher is better	3014 (3 studies)	⨁⊖⊖⊖ LOW[1,4] due to risk of bias, indirectness		The mean quality of life: sf-36 (ph) - in the control groups was 56.9	The mean quality of life: comparison of values at endpoint - QOL: sf-36 (ph) - endpoint in the intervention groups was 4.85 higher (2.49 to 7.21 higher)
Epworth Sleepiness Scale Score Scale from 0-24 Lower is better	6388 (8 studies)	⨁⊖⊖⊖ VERY LOW[1,3,4] due to risk of bias, imprecision, indirectness		The mean ESS in the control group was 8.4	The mean epworth sleepiness scale score in the intervention groups was 1.32 lower * (2.48 to 0.16 lower)
Mortality (critical outcome)	-	-	-	-	Not reported

1 Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
2 Downgraded by 1 or 2 increments for heterogeneity,unexplained by subgroup analysis. Random effect analysis used.

Outcomes	No of Participants (studies) Follow up	Quality of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects	
				Risk with Control	Risk difference with Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP (95% CI)
3 Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5; SAQLI – 2.. GRADE default MID (0.5XSD) used for all other continuous outcomes. 4 Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively *Not sleepy in both groups.					

See appendix F for full GRADE tables.

1.5 Economic evidence

1.5.1 Included studies

No health economic studies were included.

1.5.2 Excluded studies

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

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

1.5.3 Health economic modelling

Original modelling was not prioritised for this question.

1.5.4 Health economic evidence statements

No relevant economic evaluations were identified.

1.6 The committee's discussion of the evidence

1.6.1 Interpreting the evidence

1.6.1.1 The outcomes that matter most

The committee considered the outcomes of proportion adherent >4hrs/night for CPAP/non-invasive ventilation, adherence in hours/night for CPAP and oral devices, self-reported adherence, quality of life and mortality as critical outcomes for decision making. Other important outcomes included , sleepiness scores (e.g. Epworth), apnoea-Hypopnoea index (AHI) or respiratory disturbance index, oxygen desaturation index , mood or anxiety, withdrawals, treatment related withdrawals, CO_2 control, minor adverse effects of treatment, driving outcomes, neurocognitive outcomes and impact on co-existing conditions:HbA1c for diabetes, cardiovascular events for cardiovascular disease and systolic blood pressure for hypertension.

No evidence was identified for the outcomes of mortality, mood or anxiety, neurocognitive outcomes and impact on co-existing conditions: HbA1c for diabetes, cardiovascular events for cardiovascular disease and systolic blood pressure for hypertension for the OSAHS population.

1.6.1.2 The quality of the evidence

OSAHS

CPAP

The quality of the evidence for interventions to improve usage of CPAP in adults with OSAHS varied from moderate to very low quality; majority of the evidence was downgraded due to risk of bias, inconsistency, indirectness and imprecision. Risk of bias was most commonly due to selection bias. Studies were downgraded for indirectness if they included mixed severity OSAHS. The committee also acknowledged that some uncertainty existed across the effect sizes seen within the evidence, with some confidence intervals crossing the

MID thresholds or line of no effect. The committee took into account the quality of the evidence, including the uncertainty in their interpretation of the evidence.

The committee considered the clinical importance for AHI on a case by case basis, taking into consideration the baseline AHI and the improvement in severity of sleep apnoea.

There was evidence from 46 studies evaluating educational, supportive and behavioural interventions to improve use of continuous positive airway pressure in adults with obstructive sleep apnoea. Interventions in the review were classified as: educational interventions, behavioural interventions, supportive interventions and mixed interventions. There was a huge variation in the specific type of interventions used in all the categories.

Educational interventions included imparting information about CPAP treatment or about OSAHS more generally, delivered through video format, face-to-face didactic sessions, group educational sessions, written materials, or any combination of these.

There were a broad range of behavioural interventions, with a huge variation in the type (motivational interviewing, oropharyngeal exercises, audio tape with CPAP information and relaxation techniques), delivery (by psychologists, nurses/nurse counsellors) and timing of interventions (after the first session of CPAP/1 week after CPAP/1 month after CPAP).

Supportive interventions included where participants were provided with additional clinical follow-up (e.g. additional office or home-based visits, video or phone check-ins by clinical staff) or with telemonitoring equipment that facilitated self-monitoring of CPAP usage or that facilitated monitoring by clinical staff to prompt ‘as needed’ clinical follow-up.

Mixed interventions combined elements of the three previously listed intervention-types.

Most of the studies included people who are new to CPAP, and there was very little evidence available on people who have difficulty using CPAP. Studies included people with moderate and severe OSAHS.

The committee recognised the lack of evidence in people with mild sleep apnoea and in people who have difficulty using CPAP.

Positional modifiers

There was no evidence for educational, supportive and behavioural interventions to improve usage of positional modifiers in adults with OSAHS.

Oral devices

There was no evidence for educational, supportive and behavioural interventions to improve usage of oral devices in adults with OSAHS.

OHS

No evidence was identified for improving adherence of CPAP and non-invasive ventilation (NIV) in OHS.

COPD-OSAHS overlap syndrome

No evidence was identified for improving adherence of CPAP and non-invasive ventilation (NIV) in COPD-OSAHS overlap syndrome.

1.6.1.3 Benefits and harms

OSAHS

CPAP

Behavioural therapy + CPAP versus control + CPAP

The evidence suggested that there was clinically important benefit with behavioural therapy + CPAP compared to control + CPAP for the outcomes CPAP device usage (hours/night) and number of participants deemed adherent (≥ four hours/night), although there was some uncertainty around the effect estimates. The evidence suggested that there was no clinically important difference between behavioural therapy + CPAP and control + CPAP for the outcomes of withdrawal, Epworth Sleepiness Scale, AHI on treatment, and quality of life.

Educational interventions + CPAP versus usual care + CPAP

The evidence suggested that there was clinically important benefit with educational interventions + CPAP compared to usual care + CPAP for the outcomes CPAP device usage (hours/night) and number of participants deemed adherent (≥ four hours/night), although there was some uncertainty around the effect estimates. The evidence suggested that there was no clinically important difference between educational interventions + CPAP and usual care + CPAP for the outcomes of withdrawal and Epworth Sleepiness Scale.

Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP

The evidence suggested that there was clinically important benefit with supportive interventions + CPAP compared to control + CPAP for the outcomes CPAP device usage (hours/night) , , number of participants deemed adherent (≥ four hours/night), mean adherence all days (min per day) , days CPAP used > 4 hours at 3 months and systolic and diastolic blood pressure, although there was some uncertainty around the effect estimates. The evidence suggested that there was no clinically important difference between supportive interventions + CPAP and control + CPAP for the outcomes of days CPAP used > 4 hours at 12 months, CPAP use (min/night), withdrawal, Epworth Sleepiness Scale, AHI on treatment. The evidence for quality was life was inconsistent, with no difference between supportive interventions + CPAP and control + CPAP for quality of life scales SF-36, SAQLI, FOSQ and benefit for increased practical support for quality life FOSQ-10.

Mixed (educational/supportive/behavioural) intervention + CPAP versus usual care + CPAP

The evidence suggested that there was clinically important benefit with mixed interventions + CPAP compared to control + CPAP for the outcomes CPAP device usage (hours/night) and number of participants deemed adherent (≥ four hours/night), although there was some uncertainty around the effect estimates. The evidence suggested that there was no clinically important difference between mixed interventions + CPAP and control + CPAP for the outcomes of withdrawal, Epworth Sleepiness Scale, and AHI on treatment. The evidence for quality was life was inconsistent, with no difference between mixed interventions + CPAP and control + CPAP for quality of life scale FOSQ and benefit for mixed interventions for quality life FOSQ-10 and SF-36 (physical health).

Interventions to improve adherence of interventions for OSAHS- committee's consideration of the evidence

The overall evidence suggested that all types of interventions (educational, behavioural, supportive and mixed) increased CPAP usage to varying degrees in CPAP-naive participants with moderate to severe OSAHS. However, it was unclear from the evidence whether any of these interventions also led to meaningful improvement of daytime symptoms or quality of life. There was no evidence of harm associated with these interventions. Although there was uncertainty around the effect estimates for some of the outcomes, the committee agreed that the direction of effect on the whole was positive and the evidence base was large enough to justify a recommendation. The evidence did not show which category of interventions is best suited for individual patients. Also, optimum duration/intensity and long-term effectiveness of these interventions were not clear from the evidence. However, the committee did not make

a research recommendation on this as they did not consider it to be a priority for research recommendation.

In current practice some form of educational interventions is offered, however the content and delivery of these interventions is not consistent across all centers.

Based on the evidence and their knowledge of current practice, 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, teleconsultations, video consultations or use of telemonitoring) to provide support. Due to the lack of standardised content of behavioural interventions, delivery of interventions (psychologists or nurses or nurse counsellors) and the difficulty in identifying the effective components within these interventions, the committee agreed not to make a make recommendation for any specific behavioural intervention.

The committee discussed that though CPAP therapy is considered as the first line treatment of moderate and severe OSAHS and for symptomatic mild OSAHS if other management such as weight loss has not been effective (see discussion of evidence for CPAP in evidence reports E and F), the uptake and adherence can be low which limits its clinical effectiveness in patients with OSAHS. The committee from their experience stated that adhering to regular use of CPAP treatment has multiple benefits including improving the quality of sleep, reducing sleepiness during waking hours, preventing vehicle accidents, improving blood pressure control and reducing the risk of cardiovascular events. Therefore, they agreed that educational/supportive interventions to improve adherence of CPAP should be offered to all patients at initiation of therapy and as required at follow-up.

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.

Although evidence was available only for moderate and severe OSAHS, the committee agreed that the recommendations would be applicable to all severities, including people with mild OSAHS.

The committee stated that the choice of these interventions should be tailored to match individual patient needs. The committee agreed it is more helpful to focus on the content of the intervention rather than the specific type of intervention.

The committee highlighted the importance of timing of the delivery of CPAP education and support; they agreed that the initial contact and information session is a critical component in CPAP uptake and adherence.

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

The committee also discussed the importance of staff being appropriately trained to offer these interventions. They discussed that a low ratio of patients to staff should be maintained to allow individualised input but agreed that staffing issues are outside the remit of this guideline.

There was no evidence available for improving adherence for oral devices and positional modifiers in OSAHS; however, the committee agreed that the educational/supportive interventions for improving adherence for CPAP could be generalised for oral devices and positional modifiers as well.

There was no evidence for improving adherence in people who have difficulty using CPAP. The committee hence made a research recommendation for people who continue to find CPAP difficult to use despite having received some education from trained sleep professionals, access to support in the early adaptation period and/or clinical review to optimise aspects such as machine pressure, mask fit and humidification (Appendix I).

OHS

The committee agreed that the interventions to improve use of CPAP/non-invasive ventilation could be offered in people with OHS as the evidence for OSAHS population could be extrapolated to this population. The committee noted that 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.

COPD-OSAHS overlap syndrome

The committee agreed that the interventions to improve use of CPAP/ non-invasive ventilation could be offered in people with COPD-OSAHS overlap syndrome as the evidence for OSAHS population could be extrapolated to this population. The committee noted that 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.

1.6.2 Cost effectiveness and resource use

There were no economic evaluations identified for this review question.

There was clinically important benefit for educational, supportive, behavioural and a mixture of these strategies for improving device usage (hours per night). There was also some evidence of better blood pressure control. The evidence for improvement in quality of life was mixed but from their experience, the committee explained that quality of life gains associated with using CPAP and other interventions could only be achieved and sustained if the device was used regularly. Poor adherence could lead to interventions no longer being cost-effective. The committee therefore agreed that providing education and support was reasonable because they can improve adherence and contribute to the cost-effectiveness of the intervention.

The provision of education and support is current practice for people who are newly provided with CPAP. This has traditionally been provided in the form of sleep specialist (usually nurse or physiologist)-led outpatient appointments but is now most likely to be conducted remotely. People receive their first outpatient appointment for CPAP when collecting the device. During this appointment people requiring CPAP receive advice and are educated on how to use their new device e.g. cleaning, plus are fitted with an appropriate mask and taught how to ensure the mask is on properly to avoid leaks. They have reminders of the importance of using the device regularly. This appointment when initiating people with CPAP is deemed to be important by the committee because they explained early encouragement and successful adherence is an important factor on whether people will be compliant over a longer time horizon. The provision of information is then typically provided again during a follow-up sleep specialist outpatient appointment 1 month after initiation with CPAP and then per annum thereafter. It is important to note that provision of education and advice are incorporated into these appointments, but they are not exclusively for providing education and support. For example, during the same appointment sleep specialist would explore whether people with OSAHS have adequate control of their symptoms and whether further assistance is required

to improve symptoms (e.g. changing mask types, increasing machine pressure) and download data on adherence from the CPAP machine.

The provision of education and support is consistent with the minimum level of care all people should expect as explained in the Patient experiences guideline (CG138). It was therefore agreed provision of education and support should also be extended to people receiving positional modifiers or oral devices for OSAHS and CPAP or non-invasive ventilation for (COPD-OSAHS overlap syndrome and OHS). As these recommendations are consistent with what occurs in current practice, a significant resource impact is not expected due to these recommendations.

The committee noted that providing intensive behavioural interventions as described in some of the clinical studies would be quite costly. Due to the lack of cost effectiveness evidence and a concern that behavioural interventions could be interpreted in different ways (which would increase variation in practice) the committee opted to not make a recommendation for this intervention. Finally, in those people who have difficulty with using the device, the committee decided to make a research recommendation to explore a range of strategies (including behavioural strategies) that could be utilised to improve adherence.

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Appendices

Appendix A: Review protocols

Table 6: Review protocol: adherence

Field	Content
PROSPERO registration number	Not registered.
Review title	Adherence
Review question	What support improves adherence to CPAP or other interventions?
Objective	To determine what support improves adherence to CPAP or other interventions.
Searches	The following databases will be searched: • Cochrane Central Register of Controlled Trials (CENTRAL) • Cochrane Database of Systematic Reviews (CDSR) • Embase • MEDLINE • Epistemonikos Searches will be restricted by: • English language studies The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies will be published in the final review.
Condition or domain being studied	Obstructive sleep apnoea/hypopnoea syndrome is the most common form of sleep disordered breathing. The guideline will also cover obesity hypoventilation syndrome and COPD-OSAHS overlap syndrome (the coexistence of obstructive sleep apnoea/hypopnoea syndrome and chronic obstructive pulmonary disease).
Population	Inclusion: People (16 and older) with OSAHS, OHS or COPD-OSAHS overlap syndrome Population will be stratified by: • Population: OSAHS, OHS, COPD-OSAHS overlap syndrome • Severity: Mild, moderate, severe (based on AHI/ODI) • Devices: Positive airway pressure devices, position modifiers, oral devices • Types of interventions (educational, behavioural, supportive) Severity: • Mild OSAHS: AHI >5 but <15

	• Moderate OSAHS: AHI >/= 15 but <30 • Severe OSAHS: AHI >/= 30 When a mixed severity population is included the severity of the majority of the population will be used by taking the mean AHI of the patients included and the study will be downgraded for indirectness. Exclusion: Children and young adults (under 16 years old)
Intervention/Exposure/ Test	• Short term or sustained behavioural intervention aimed at encouraging uptake, acclimation, improvement or maintenance of adherence to long term OSAHS, OHS, COPD-OSAHS overlap syndrome treatment Examples may include ◦ educational interventions, ◦ supportive interventions, ◦ interactive interactions, ◦ group-based interventions, ◦ mindfulness-based interventions, cognitive interventions, ◦ behavioural interventions, ◦ motivational strategies ◦ combination of multiple interventions
Comparator/Reference standard/Confounding factors	• Any of the above vs no intervention • Background level of information and support at the study centre (that must also be provided to intervention group)
Types of study to be included	• RCTs • Systematic review of RCTs • Parallel or crossover to be included
Other exclusion criteria	Non-English language studies. Conference abstracts will be excluded as it is expected there will be sufficient full text published studies available.
Context	-
Primary outcomes (critical outcomes)	• Generic or disease specific validated quality of life measures (continuous) • Mortality (dichotomous) • Proportion adherent >4hrs/night for CPAP/ non-invasive ventilation (dichotomous) • Adherence in hours/night for CPAP and oral devices (continuous) • Self-reported adherence (continuous)
Secondary outcomes (important outcomes)	• mood or anxiety • withdrawals • Treatment related withdrawals (dichotomous) • Sleepiness scores (continuous, e.g. Epworth) • Apnoea-Hypopnoea index or respiratory disturbance index (continuous) • Oxygen desaturation index (continuous) • CO_2 control (continuous) • Minor adverse effects of treatment (rates or dichotomous) • Driving outcomes (continuous)

	• Neurocognitive outcomes (continuous)
	• Impact on co-existing conditions:
	  ○ HbA1c for diabetes (continuous)
	  ○ Cardiovascular events for cardiovascular disease (dichotomous)
	  ○ Systolic blood pressure for hypertension (continuous)
	
	Outcomes will be separated into short term (latest follow-up to 6 months) and long term (latest follow-up beyond 6 months)

Data extraction (selection and coding)	EndNote will be used for reference management, sifting, citations and bibliographies. All references identified by the searches and from other sources will be screened for inclusion. 10% of the abstracts will be reviewed by two reviewers, with any disagreements resolved by discussion or, if necessary, a third independent reviewer. The full text of potentially eligible studies will be retrieved and will be assessed in line with the criteria outlined above. EviBASE will be used for data extraction.
Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual. • Systematic reviews: Risk of Bias in Systematic Reviews (ROBIS) • Randomised Controlled Trial: Cochrane RoB (2.0) 10% of all evidence reviews are quality assured by a senior research fellow. This includes checking: • papers were included /excluded appropriately • a sample of the data extractions • correct methods are used to synthesise data • a sample of the risk of bias assessments Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary.
Strategy for data synthesis	• Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5). • GRADEpro will be used to assess the quality of evidence for each outcome, taking into account individual study quality and the meta-analysis results. The 4 main quality elements (risk of bias, indirectness, inconsistency and imprecision) will be appraised for each outcome. Publication bias is tested for when there are more than 5 studies for an outcome. The risk of bias across all available evidence was evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ • Where meta-analysis is not possible, data will be presented, and quality assessed individually per outcome. • WinBUGS will be used for network meta-analysis, if possible, given the data identified.

	Heterogeneity between the studies in effect measures will be assessed using the I^2 statistic and visually inspected. An I^2 value greater than 50% will be considered indicative of substantial heterogeneity. Sensitivity analyses will be conducted based on pre-specified subgroups using stratified meta-analysis to explore the heterogeneity in effect estimates. If this does not explain the heterogeneity, the results will be presented pooled using random-effects.	
Analysis of sub-groups	**Subgroups (to be assessed in the presence of heterogeneity)** • High risk occupational groups (for example heavy goods vehicle drivers) vs general population • Sleepiness – Epworth >9 vs Epworth 9 or less • Coexisting conditions – type 2 diabetes vs atrial fibrillation vs hypertension vs none • BMI – obese vs non-obese • Stage of intervention – treatment naïve vs prior treatment use • Age – <65 vs >/=65 • Hours per night outcome – minute by minute reporting vs counter output for time on	
Type and method of review	☒	Intervention
	☐	Diagnostic
	☐	Prognostic
	☐	Qualitative
	☐	Epidemiologic
	☐	Service Delivery
	☐	Other (please specify)
Language	English	
Country	England	
Anticipated or actual start date	NA – not registered on PROSPERO	
Anticipated completion date	NA – not registered on PROSPERO	
Named contact	5a. Named contact National Guideline Centre 5b Named contact e-mail SleepApnoHypo@nice.org.uk 5e Organisational affiliation of the review National Institute for Health and Care Excellence (NICE) and the National Guideline Centre	
Review team members	From the National Guideline Centre: Carlos Sharpin, Guideline lead	

	Sharangini Rajesh, Senior systematic reviewer Audrius Stonkus, Systematic reviewer Emtiyaz Chowdhury (until January 2020), Health economist David Wonderling, Head of health economics Agnes Cuyas, Information specialist (till December 2019) Jill Cobb, Information specialist
Funding sources/sponsor	This systematic review is being completed by the National Guideline Centre which receives funding from NICE.
Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website: https://www.nice.org.uk/guidance/indevelopment/gid-ng10098
Other registration details	NA – not registered
Reference/URL for published protocol	NA – not registered
Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.
Keywords	-
Details of existing review of same topic by same authors	NA
Additional information	-
Details of final publication	www.nice.org.uk

Table 7: Health economic review protocol

Review question	**All questions – health economic evidence**
Objectives	To identify health economic studies relevant to any of the review questions.

Search criteria	• Populations, interventions and comparators must be as specified in the clinical review protocol above. • Studies must be of a relevant health economic study design (cost–utility analysis, cost-effectiveness analysis, cost–benefit analysis, cost–consequences analysis, comparative cost analysis). • Studies must not be a letter, editorial or commentary, or a review of health economic evaluations. (Recent reviews will be ordered although not reviewed. The bibliographies will be checked for relevant studies, which will then be ordered.) • Unpublished reports will not be considered unless submitted as part of a call for evidence. • Studies must be in English.
Search strategy	A health economic study search will be undertaken using population-specific terms and a health economic study filter – see appendix B below.
Review strategy	Studies not meeting any of the search criteria above will be excluded. Studies published before 2003, abstract-only studies and studies from non-OECD countries or the USA will also be excluded. Each remaining study will be assessed for applicability and methodological limitations using the NICE economic evaluation checklist which can be found in appendix H of Developing NICE guidelines: the manual (2014).[60] **Inclusion and exclusion criteria** • If a study is rated as both 'Directly applicable' and with 'Minor limitations' then it will be included in the guideline. A health economic evidence table will be completed, and it will be included in the health economic evidence profile. • If a study is rated as either 'Not applicable' or with 'Very serious limitations' then it will usually be excluded from the guideline. If it is excluded, then a health economic evidence table will not be completed, and it will not be included in the health economic evidence profile. • If a study is rated as 'Partially applicable', with 'Potentially serious limitations' or both then there is discretion over whether it should be included. **Where there is discretion** The health economist will make a decision based on the relative applicability and quality of the available evidence for that question, in discussion with the guideline committee if required. The ultimate aim is to include health economic studies that are helpful for decision-making in the context of the guideline and the current NHS setting. If several studies are considered of sufficiently high applicability and methodological quality that they could all be included, then the health economist, in discussion with the committee if required, may decide to include only the most applicable studies and to selectively exclude the remaining studies. All studies excluded on the basis of applicability or methodological limitations will be listed with explanation in the excluded health economic studies appendix below. The health economist will be guided by the following hierarchies. *Setting:* • UK NHS (most applicable). • OECD countries with predominantly public health insurance systems (for example, France, Germany, Sweden). • OECD countries with predominantly private health insurance systems (for example, Switzerland). • Studies set in non-OECD countries or in the USA will be excluded before being assessed for applicability and methodological limitations. *Health economic study type:* • Cost–utility analysis (most applicable).

	• Other type of full economic evaluation (cost–benefit analysis, cost-effectiveness analysis, cost–consequences analysis). • Comparative cost analysis. • Non-comparative cost analyses including cost-of-illness studies will be excluded before being assessed for applicability and methodological limitations. *Year of analysis:* • The more recent the study, the more applicable it will be. • Studies published in 2003 or later but that depend on unit costs and resource data entirely or predominantly from before 2003 will be rated as 'Not applicable'. • Studies published before 2003 will be excluded before being assessed for applicability and methodological limitations. *Quality and relevance of effectiveness data used in the health economic analysis:* • The more closely the clinical effectiveness data used in the health economic analysis match with the outcomes of the studies included in the clinical review the more useful the analysis will be for decision-making in the guideline.

Appendix B: Literature search strategies

Sleep Apnoea search strategy 1 adherence

This literature search strategy was used for the following review;

- What support improves adherence to CPAP or other interventions?

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual.[60]

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

B.1 Clinical search literature search strategy

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

Table 8: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 6 July 2020	Exclusions Randomised controlled trials Systematic review studies
Embase (OVID)	1974 – 6 July 2020	Exclusions Randomised controlled trials Systematic review studies
The Cochrane Library (Wiley)	Cochrane Reviews to 2020 Issue 7 of 12 CENTRAL to 2020 Issue 7 of 12	None
Epistemonikos (Epistemonikos Foundation)	Inception – 29 November 2018	None

Medline (Ovid) search terms

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

12.	exp historical article/
13.	Anecdotes as Topic/
14.	comment/
15.	case report/
16.	(letter or comment*).ti.
17.	or/9-16
18.	randomized controlled trial/ or random*.ti,ab.
19.	17 not 18
20.	animals/ not humans/
21.	exp Animals, Laboratory/
22.	exp Animal Experimentation/
23.	exp Models, Animal/
24.	exp Rodentia/
25.	(rat or rats or mouse or mice).ti.
26.	or/19-25
27.	8 not 26
28.	Patient compliance/ or patient dropouts/ or treatment refusal/
29.	(discontinu* or abstention or abstain* or stop* or abandon* or uptak* or acclimat* or mainten* or keep*).ti,ab.
30.	(adhere* or adhering or nonadhere* or non-adhere* or non-adhering or complian* or complying or non-complian* or noncomplian* or concordance or capacitance).ti,ab.
31.	or/28-30
32.	((oral or intraoral or intra-oral) adj3 (device* or prosthes* or appliance* or splint*)).ti,ab.
33.	(MAD or MADs or MAS or MRS).ti,ab.
34.	((dental or orthodontic* or orthosis or orthotic) adj3 (device* or prosthes* or appliance* or splint*)).ti,ab.
35.	(tongue adj3 (device* or prosthes* or appliance* or splint* or retain* or reposition* or stabiliz* or stabilis* or advancement or advancing or retention or protruding or protrude or protruded or protrusion or forward or mouthpiece*)).ti,ab.
36.	(mandib* adj3 (device* or prosthes* or appliance* or splint* or advancement or advancing or protruding or protrude or protruded or protrusion or reposition* or position*)).ti,ab.
37.	(positive airway* pressure or PAP or CPAP or aPAP or nCPAP or autoCPAP or auto-CPAP or biPAP or BPAP or NBiPAP or NBPAP or NIV).ti,ab.
38.	(positive adj3 pressure adj (therapy or device* or ventilat*)).ti,ab.
39.	or/32-38
40.	27 and 31 and 39
41.	randomized controlled trial.pt.
42.	controlled clinical trial.pt.
43.	randomi#ed.ti,ab.
44.	placebo.ab.
45.	randomly.ti,ab.
46.	Clinical Trials as topic.sh.
47.	trial.ti.
48.	or/41-47
49.	Meta-Analysis/
50.	exp Meta-Analysis as Topic/

51.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
52.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
53.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
54.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
55.	(search* adj4 literature).ab.
56.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
57.	cochrane.jw.
58.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
59.	or/49-58
60.	40 and (48 or 59)

Embase (Ovid) search terms

1.	exp Sleep Disordered Breathing/
2.	(sleep* adj4 (apn?ea* or hypopn?ea*)).ti,ab.
3.	(sleep* adj4 disorder* adj4 breath*).ti,ab.
4.	(OSAHS or OSA or OSAS).ti,ab.
5.	(obes* adj3 hypoventil*).ti,ab.
6.	pickwick*.ti,ab.
7.	or/1-6
8.	limit 7 to English language
9.	letter.pt. or letter/
10.	note.pt.
11.	editorial.pt.
12.	case report/ or case study/
13.	(letter or comment*).ti.
14.	or/9-13
15.	randomized controlled trial/ or random*.ti,ab.
16.	14 not 15
17.	animal/ not human/
18.	nonhuman/
19.	exp Animal Experiment/
20.	exp Experimental Animal/
21.	animal model/
22.	exp Rodent/
23.	(rat or rats or mouse or mice).ti.
24.	or/16-23
25.	8 not 24
26.	patient compliance/ or patient dropout/ or treatment refusal/
27.	(discontinu* or abstention or abstain* or stop* or abandon* or uptak* or acclimat* or mainten* or keep*).ti,ab.
28.	(adhere* or adhering or nonadhere* or non-adhere* or non-adhering or complian* or complying or non-complian* or noncomplian* or concordance or capacitance).ti,ab.
29.	or/26-28
30.	((oral or intraoral or intra-oral) adj3 (device* or prosthes* or appliance* or splint*)).ti,ab.

31.	(MAD or MADs or MAS or MRS).ti,ab.
32.	((dental or orthodontic* or orthosis or orthotic) adj3 (device* or prosthes* or appliance* or splint*)).ti,ab.
33.	(tongue adj3 (device* or prosthes* or appliance* or splint* or retain* or reposition* or stabiliz* or stabilis* or advancement or advancing or retention or protruding or protrude or protruded or protrusion or forward or mouthpiece*)).ti,ab.
34.	(mandib* adj3 (device* or prosthes* or appliance* or splint* or advancement or advancing or protruding or protrude or protruded or protrusion or reposition* or position*)).ti,ab.
35.	(positive airway* pressure or PAP or CPAP or aPAP or nCPAP or autoCPAP or auto-CPAP or biPAP or BPAP or NBiPAP or NBPAP or NIV).ti,ab.
36.	(positive adj3 pressure adj (therapy or device* or ventilat*)).ti,ab.
37.	or/30-36
38.	25 and 29 and 37
39.	random*.ti,ab.
40.	factorial*.ti,ab.
41.	(crossover* or cross over*).ti,ab.
42.	((doubl* or singl*) adj blind*).ti,ab.
43.	(assign* or allocat* or volunteer* or placebo*).ti,ab.
44.	crossover procedure/
45.	single blind procedure/
46.	randomized controlled trial/
47.	double blind procedure/
48.	or/39-47
49.	systematic review/
50.	meta-analysis/
51.	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
52.	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
53.	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
54.	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
55.	(search* adj4 literature).ab.
56.	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
57.	cochrane.jw.
58.	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
59.	or/49-58
60.	38 and (48 or 59)

Cochrane Library (Wiley) search terms

#1.	MeSH descriptor: [Sleep Apnea Syndromes] explode all trees
#2.	(sleep* near/4 (apnea* or apnoea* or hypopnea* or hypopnoea*)):ti,ab
#3.	(sleep* near/4 disorder* near/4 breath*):ti,ab
#4.	(OSAHS or OSA or OSAS):ti,ab
#5.	(obes* near/3 hypoventil*):ti,ab
#6.	pickwick*:ti,ab
#7.	(OR #1-#6)

#8.	MeSH descriptor: [Patient Compliance] this term only
#9.	MeSH descriptor: [Patient Dropouts] this term only
#10.	MeSH descriptor: [Treatment Refusal] this term only
#11.	(discontinu* or abstention or abstain* or stop* or abandon* or uptak* or acclimat* or mainten* or keep*):ti,ab
#12.	(adhere* or adhering or nonadhere* or non-adhere* or non-adhering or complian* or complying or non-complian* or noncomplian* or concordance or capacitance):ti,ab
#13.	(OR #8-#12)
#14.	((oral or intraoral or intra-oral) near/3 (device* or prosthes* or appliance* or splint*)):ti,ab
#15.	(MAD or MADs or MAS or MRS):ti,ab
#16.	((dental or orthodontic* or orthosis or orthotic) near/3 (device* or prosthes* or appliance* or splint*)):ti,ab
#17.	(tongue near/3 (device* or prosthes* or appliance* or splint* or retain* or reposition* or stabiliz* or stabilis* or advancement or advancing or retention or protruding or protrude or protruded or protrusion or forward or mouthpiece*)):ti,ab
#18.	(mandib* near/3 (device* or prosthes* or appliance* or splint* or advancement or advancing or protruding or protrude or protruded or protrusion or reposition* or position*)):ti,ab
#19.	(positive airway* pressure or PAP or CPAP or aPAP or nCPAP or autoCPAP or auto-CPAP or biPAP or BPAP or NBiPAP or NBPAP or NIV):ti,ab
#20.	(positive near/3 pressure near/1 (therapy or device* or ventilat*)):ti,ab
#21.	(OR #14-#20)
#22.	#7 AND #13 AND #21

Epistemonikos search terms

1.	((title:((sleep apnea syndromes) OR (sleep* AND (apn?ea* OR hypopn?ea*)) OR (sleep* AND (apn?ea* OR hypopn?ea*)) OR (sleep* AND (disorder* OR breath*)) OR (OSAHS OR OSA OR OSAS) OR (obes* AND hypoventil*) OR pickwick*) OR abstract:((sleep apnea syndromes) OR (sleep* AND (apn?ea* OR hypopn?ea*)) OR (sleep* AND (apn?ea* OR hypopn?ea*)) OR (sleep* AND (disorder* OR breath*)) OR (OSAHS OR OSA OR OSAS) OR (obes* AND hypoventil*) OR pickwick*)))

B.2 Health Economics literature search strategy

Health economic evidence was identified by conducting a broad search relating to sleep apnoea population in NHS Economic Evaluation Database (NHS EED – this ceased to be updated after March 2015) and the Health Technology Assessment database (HTA – this ceased to be updated after March 2018) with no date restrictions. NHS EED and HTA databases are hosted by the Centre for Research and Dissemination (CRD). Additional searches were run on Medline and Embase for health economics and quality of life studies.

B.2.1 Health economic studies strategy

Table 9: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	2014 – 6 July 2020	Exclusions Health economics studies
Embase	2014 – 6 July 2020	Exclusions Health economics studies
Centre for Research and		None

Database	Dates searched	Search filter used
Dissemination (CRD)	HTA - Inception – 31 March 2018 NHSEED - Inception to March 2015	

Medline (Ovid) search terms

	exp Sleep Apnea Syndromes/
1.	(sleep* adj4 (apn?ea* or hypopn?ea*)).ti,ab.
2.	(sleep* adj4 disorder* adj4 breath*).ti,ab.
3.	(OSAHS or OSA or OSAS).ti,ab.
4.	(obes* adj3 hypoventil*).ti,ab.
5.	pickwick*.ti,ab.
6.	or/1-6
7.	limit 7 to English language
8.	letter/
9.	editorial/
10.	news/
11.	exp historical article/
12.	Anecdotes as Topic/
13.	comment/
14.	case report/
15.	(letter or comment*).ti.
16.	or/9-16
17.	randomized controlled trial/ or random*.ti,ab.
18.	17 not 18
19.	animals/ not humans/
20.	exp Animals, Laboratory/
21.	exp Animal Experimentation/
22.	exp Models, Animal/
23.	exp Rodentia/
24.	(rat or rats or mouse or mice).ti.
25.	or/19-25
26.	8 not 26
27.	Economics/
28.	Value of life/
29.	exp "Costs and Cost Analysis"/
30.	exp Economics, Hospital/
31.	exp Economics, Medical/
32.	Economics, Nursing/
33.	Economics, Pharmaceutical/
34.	exp "Fees and Charges"/
35.	exp Budgets/
36.	budget*.ti,ab.
37.	cost*.ti.

38.	(economic* or pharmaco?economic*).ti.
39.	(price* or pricing*).ti,ab.
40.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
41.	(financ* or fee or fees).ti,ab.
42.	(value adj2 (money or monetary)).ti,ab.
43.	or/28-43
44.	27 and 44

Embase (Ovid) search terms

1.	exp Sleep Disordered Breathing/
2.	(sleep* adj4 (apn?ea* or hypopn?ea*)).ti,ab.
3.	(sleep* adj4 disorder* adj4 breath*).ti,ab.
4.	(OSAHS or OSA or OSAS).ti,ab.
5.	(obes* adj3 hypoventil*).ti,ab.
6.	pickwick*.ti,ab.
7.	or/1-6
8.	limit 7 to English language
9.	letter.pt. or letter/
10.	note.pt.
11.	editorial.pt.
12.	case report/ or case study/
13.	(letter or comment*).ti.
14.	or/9-13
15.	randomized controlled trial/ or random*.ti,ab.
16.	14 not 15
17.	animal/ not human/
18.	nonhuman/
19.	exp Animal Experiment/
20.	exp Experimental Animal/
21.	animal model/
22.	exp Rodent/
23.	(rat or rats or mouse or mice).ti.
24.	or/16-23
25.	8 not 24
26.	health economics/
27.	exp economic evaluation/
28.	exp health care cost/
29.	exp fee/
30.	budget/
31.	funding/
32.	budget*.ti,ab.
33.	cost*.ti.
34.	(economic* or pharmaco?economic*).ti.

35.	(price* or pricing*).ti,ab.
36.	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
37.	(financ* or fee or fees).ti,ab.
38.	(value adj2 (money or monetary)).ti,ab.
39.	or/26-38
40.	25 and 39

NHS EED and HTA (CRD) search terms

#1.	MeSH DESCRIPTOR Sleep Apnea Syndromes EXPLODE ALL TREES
#2.	(sleep* adj4 (apn?ea* or hypopn?ea*))
#3.	(sleep* adj4 disorder* adj4 breath*)
#4.	(OSAHS or OSA or OSAS)
#5.	(obes* adj3 hypoventil*)
#6.	(pickwick*)
#7.	#1 OR #2 OR #3 OR #4 OR #5 OR #6

B.2.2 Quality of life studies strategy

Table 10: Database date parameters and filters used

Database	Dates searched	Search filter used
Medline	1946 – 26 November 2019	Exclusions Quality of life studies
Embase	1974 – 26 November 2019	Exclusions Quality of life studies

Medline (Ovid) search terms

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

18.	randomized controlled trial/ or random*.ti,ab.
19.	17 not 18
20.	animals/ not humans/
21.	exp Animals, Laboratory/
22.	exp Animal Experimentation/
23.	exp Models, Animal/
24.	exp Rodentia/
25.	(rat or rats or mouse or mice).ti.
26.	or/19-25
27.	8 not 26
28.	quality-adjusted life years/
29.	sickness impact profile/
30.	(quality adj2 (wellbeing or well being)).ti,ab.
31.	sickness impact profile.ti,ab.
32.	disability adjusted life.ti,ab.
33.	(qal* or qtime* or qwb* or daly*).ti,ab.
34.	(euroqol* or eq5d* or eq 5*).ti,ab.
35.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
36.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
37.	(hui or hui1 or hui2 or hui3).ti,ab.
38.	(health* year* equivalent* or hye or hyes).ti,ab.
39.	discrete choice*.ti,ab.
40.	rosser.ti,ab.
41.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
42.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
43.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
44.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
45.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
46.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
47.	or/28-46
48.	27 and 47

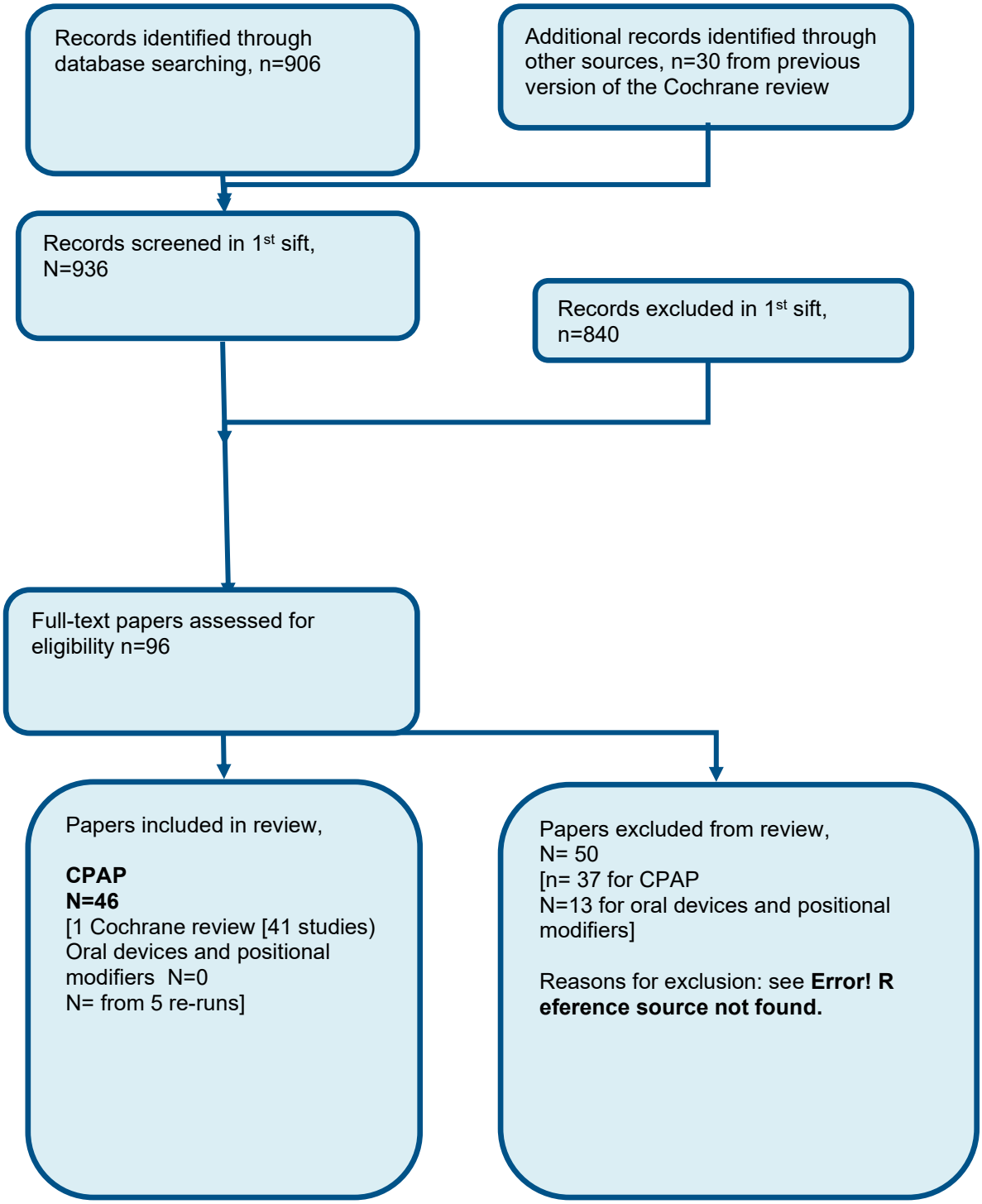
Embase (Ovid) search terms

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

10.	note.pt.
11.	editorial.pt.
12.	case report/ or case study/
13.	(letter or comment*).ti.
14.	or/9-13
15.	randomized controlled trial/ or random*.ti,ab.
16.	14 not 15
17.	animal/ not human/
18.	nonhuman/
19.	exp Animal Experiment/
20.	exp Experimental Animal/
21.	animal model/
22.	exp Rodent/
23.	(rat or rats or mouse or mice).ti.
24.	or/16-23
25.	8 not 24
26.	quality adjusted life year/
27.	"quality of life index"/
28.	short form 12/ or short form 20/ or short form 36/ or short form 8/
29.	sickness impact profile/
30.	(quality adj2 (wellbeing or well being)).ti,ab.
31.	sickness impact profile.ti,ab.
32.	disability adjusted life.ti,ab.
33.	(qal* or qtime* or qwb* or daly*).ti,ab.
34.	(euroqol* or eq5d* or eq 5*).ti,ab.
35.	(qol* or hql* or hqol* or h qol* or hrqol* or hr qol*).ti,ab.
36.	(health utility* or utility score* or disutilit* or utility value*).ti,ab.
37.	(hui or hui1 or hui2 or hui3).ti,ab.
38.	(health* year* equivalent* or hye or hyes).ti,ab.
39.	discrete choice*.ti,ab.
40.	rosser.ti,ab.
41.	(willingness to pay or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
42.	(sf36* or sf 36* or short form 36* or shortform 36* or shortform36*).ti,ab.
43.	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
44.	(sf12* or sf 12* or short form 12* or shortform 12* or shortform12*).ti,ab.
45.	(sf8* or sf 8* or short form 8* or shortform 8* or shortform8*).ti,ab.
46.	(sf6* or sf 6* or short form 6* or shortform 6* or shortform6*).ti,ab.
47.	or/26-46
48.	25 and 47

Appendix C: Clinical evidence selection

Figure 1: Flow chart of clinical study selection for the review of adherence



Appendix D: Clinical evidence tables

Study	**Askland et al[5]**
Study type	Systematic review
Number of studies (number of participants)	N= 41 studies, 8968 patients Randomised, parallel-controlled trials of any duration.
Countries and setting	Conducted in Multiple countries; Setting: Hospital, community or home based
Line of therapy	Mixed line
Duration of study	Intervention + follow up: 28 days – 2 years
Method of assessment of guideline condition	Yes
Stratum	Severe OSAHS
Subgroup analysis within study	Not applicable
Inclusion criteria	For inclusion in the review, intervention and control groups must have either 1) received the same make of CPAP machine and pressure delivery mode (i.e. fixed, auto-titrating, bi-level, etc.) or 2) receive CPAP machines in a randomly distributed manner, such that machine make remained independent of group assignment. **Intervention group** Any short-term or sustained behavioural intervention aimed at encouraging uptake, acclimation, improvement or maintenance of CPAP adherence among people with a diagnosis of OSA. Examples of modalities that may fall under 'behavioural interventions' include educational, supportive, interactive, group-based, mindfulness-based, cognitive, behavioural, motivational or approaches utilizing a combination of these strategies.

Study	Askland et al[5]
	Control group Participants in the control group may receive instruction that would be used by the study centre in question, provided that the equivalent 'background' level of instruction was also offered and/or delivered to the intervention group.
Exclusion criteria	Trials that explicitly recruited patients with central sleep apnoea were not eligible for inclusion.
Recruitment/selection of patients	Participants had to be randomised in trials assessing one of the following comparisons: 1. Behavioural therapy + CPAP versus control + CPAP 2. Educational interventions + CPAP versus usual care + CPAP 3. Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP 4. Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP
Age, gender and ethnicity	Average age of the study populations was 52.9 years. Patients were of mixed gender predominately male and of different ethnicities.
Further population details	Participants were adults of either sex with a diagnosis of obstructive sleep apnoea (OSA) diagnosed using a recognised sleep diagnostic tool giving an Oxygen Desaturation Index (ODI) of ≥5 per hours or an Apnoea Hypopnea Index (AHI) ≥5 per hour.
Extra comments	Most studies were conducted in the North America and Europe with smaller number of trials conducted in China and Australia. Study population ranged from 12 to 3100 participants.
Indirectness of population	No indirectness
Interventions	Intervention 1 : Behavioural therapy + CPAP versus control + CPAP (n=11 studies; 1139 participants): Duration between 2 months and 12 months

Study	Askland et al[5]
	Indirectness: No indirectness Intervention 2: Educational interventions + CPAP versus usual care + CPAP (n= 11 studies; 2752 participants) Duration between 28 days and 12 months Indirectness: No indirectness Intervention 3: Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP (n= 14 studies; 1498 participants) Duration 2 months to 6 months. Indirectness: No indirectness Intervention 4: Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP (n= 12 studies; 5041 participants) Duration 1 month to 2 years. Indirectness: No indirectness
Funding	The majority of the included studies were funded by industry
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: Behavioural therapy + CPAP versus control + CPAP Protocol outcome 1: CPAP device usage (hours/night)	

Study	Askland et al[5]
- Actual outcome: CPAP Device Usage (hours/night) ; MD 1.31 hours/night higher(0.95 higher to 1.66 higher) Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Number of participants who used CPAP therapy > 4 hours per night - Actual outcome: Number of participants who used CPAP therapy > 4 hours per night; RR; 1.33 [95% CI 1.10, 1.61] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data – High, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Withdrawal - Actual outcome: Withdrawals; RR; 0.70 [95% CI 0.51,0.98] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 4: Symptoms (Epworth Sleepiness Scale) - Actual outcome: Epworth sleepiness scale (Endpoint scores); MD; -2.22 (-3.68, -0.75] Risk of bias: All domain - high, Selection –high, Blinding - Low, Incomplete outcome data - High, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: serious indirectness Protocol outcome 5: AHI on treatment - Actual outcome: AHI on treatment (endpoint scores); MD; -0.95 [95% CI -2.25, to 0.35] Risk of bias: All domain - high, Selection - high, Blinding - high, Incomplete outcome data - high, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 6: Quality of life (Functional Outcome of Sleep Questionnaire) - Actual outcome: Quality of life (Functional Outcome of Sleep Questionnaire)Endpoint ; MD 0.01 [95% CI -0.26, 0.29]

Study	Askland et al[5]
Risk of bias: All domain - high, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 7: Quality of life (SF-36 PH) - Actual outcome: Quality of life (SF-36 PH); MD -0.07 [95% CI -0.82, 0.67] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: Educational interventions + CPAP versus usual care + CPAP Protocol outcome 1: CPAP device usage (hours/night) - Actual outcome: CPAP Device Usage (hours/night) ; MD 0.88 hours/night higher (0.40 higher to 1.36 higher) Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Deemed Adherent (Number of participants who used CPAP therapy > 4 hours/night) - Actual outcome: Number of participants who used CPAP therapy > 4 hours per night; RR; 1.31 [95% CI 1.15, 1.48] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data – High, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Withdrawals - Actual outcome: Withdrawals; RR 0.73 [0.52, 1.02] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 4: Symptoms (Epworth Sleepiness Scale)	

Study	Askland et al[5]
- Actual outcome: Symptoms (Epworth Sleepiness Scale); MD -0.08 [-0.92, 0.76] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data – high, Outcome reporting – high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP Protocol outcome 1: CPAP Machine usage (hours/night) - Actual outcome: Machine usage (hours/night); MD 0.70 [0.36, 1.05] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Deemed Adherent (Number of participants who used CPAP therapy > 4 hours/night) - Actual outcome: Number of participants who used CPAP therapy > 4 hours per night; RR; 1.19 [95% CI 1.03, 1.37] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Withdrawals - Actual outcome: Withdrawals; RR 1.22 [0.97, 1.52] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 4.1 Symptoms (Epworth Sleepiness Scale) - Actual outcome: Endpoint scores (Epworth Sleepiness Scale); MD 0.03 [-0.59, 0.64] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data – Low, Outcome reporting – high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 4.2 Symptoms (Epworth Sleepiness Scale) - Actual outcome: Change from baseline (Epworth Sleepiness Scale); MD -0.32 [-1.19, 0.56]	

Study	Askland et al[5]
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data – high, Outcome reporting – Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 5.1: Quality of life (Functional Outcome of Sleep Questionnaire) - Actual outcome: Functional Outcome of Sleep Questionnaire - Endpoint; SMD 0.15 [95% CI -0.23, 0.53] Risk of bias: All domain - high, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 5.2: Quality of life (SAQLI) - Actual outcome: SAQLI - Endpoint; SMD 0.22 [95% CI -0.04, 0.47] Risk of bias: All domain - high, Selection - Low, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 5.3: Quality of life (SF-36 PH) - Actual outcome: Quality of life - SF-36 PH - endpoint; SMD 0.13 [95% CI -0.09, 0.34] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 6.1: Quality of life (Functional Outcome of Sleep Questionnaire) - Actual outcome: Functional Outcome of Sleep Questionnaire – Change from baseline; SMD 0.24 [95% CI -0.40, 0.87] Risk of bias: All domain - high, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 6.2: Quality of life (SF-36 PH) - Actual outcome: Quality of life - SF-36 PH – change from baseline; SMD 0.04 [95% CI -0.40, 0.47] Risk of bias: All domain - high, Selection - low, Blinding - Low, Incomplete outcome data - high, Outcome reporting - low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	

Study	Askland et al[5]
Protocol outcome 6.3: Quality of life (Functional Outcome of Sleep Questionnaire - 10) - Actual outcome: Functional Outcome of Sleep Questionnaire - 10 – Change from baseline; SMD 0.24 [95% CI 0.00, 0.60] Risk of bias: All domain - high, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 7: Anxiety Symptom Rating (HADS-A) - Actual outcome: Anxiety symptom rating (HADS-A) –comparison of values at endpoint; MD -1.10 [95% CI -2.95, 0.75] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 8: AHI on treatment - Actual outcome: AHI on treatment –comparison of values at endpoint; MD 0.48 [95% CI -4.23, 5.18] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 9.1: HADS - Depression - Actual outcome: HADS Depression –comparison of values at endpoint; SMD -0.43 [95% CI -0.87, 0.01] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 9.2: CES - D - Actual outcome: CES – D –comparison of values at endpoint; SMD 0.25 [95% CI 0.02, 0.49] Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP Protocol outcome 1: CPAP device usage (hours/night) - Actual outcome: CPAP Device Usage (hours/night) ; MD 0.82 hours/night higher (95% CI 0.20, 1.43)	

Study	Askland et al[5]
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 2: Deemed Adherent (Number of participants who used CPAP therapy > 4 hours/night) - Actual outcome: Number of participants who used CPAP therapy > 4 hours per night; RR; 1.14 [95% CI 1.04, 1.26]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data – low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 3: Withdrawals - Actual outcome: Withdrawals; RR 0.64 [0.32, 1.28]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 4.1: Quality of life (Functional Outcome of Sleep Questionnaire - 10) - Actual outcome: Functional Outcome of Sleep Questionnaire - 10 – Change from baseline; SMD 0.25 [95% CI -0.05, 0.54]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 4.2: Quality of life (SF-36 MH) - Actual outcome: Quality of life - SF-36 MH – change from baseline; SMD Not Estimable	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - low, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 4.3: Quality of life (SF-36 PH) - Actual outcome: Quality of life - SF-36 PH – change from baseline; SMD 0.59 [95% CI -0.52, 0.67]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 5.1: Quality of life (FOSQ - Endpoint) - Actual outcome: QOL: FOSQ - Endpoint; SMD 0.10 [95% CI -0.19, 0.40]	

Study	Askland et al[5]
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcome 5.2: Quality of life (SF-36 PH) - Actual outcome: Quality of life - SF-36 PH - endpoint; SMD 0.59 [95% CI -0.01, 1.19]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - high, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcome 6.1: Anxiety symptom rating – comparison of values at endpoint - Actual outcome: Anxiety symptom rating - endpoint; SMD -0.19 [95% CI -0.47, 0.09]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcome 6.2: DASS - Anxiety - Actual outcome: DASS - Anxiety - endpoint; SMD -0.19 [95% CI -0.47, 0.09]	
Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcome 6.3: BAI - Anxiety - Actual outcome: BAI – Anxiety - endpoint; SMD -0.15 [95% CI -0.63, 0.34]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcome 6.4: STAI – State - Actual outcome: STAI – state - Anxiety - endpoint; SMD -0.49 [95% CI -0.92, -0.06]	
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcome 7.1: Depression Symptom rating – endpoint – NO META ANALYSIS PERFORMED - Actual outcome: Depression Symptom rating – endpoint – No totals	

Study	Askland et al[5]
Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 7.2: BDI - depression – endpoint – NO META ANALYSIS PERFORMED - Actual outcome: BDI – depression – endpoint – No totals Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 7.3: HADS - depression – endpoint – NO META ANALYSIS PERFORMED - Actual outcome: HADS – depression – endpoint – No totals Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - high, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 7.4: DASS - depression – endpoint – NO META ANALYSIS PERFORMED - Actual outcome: DASS – depression – endpoint – No totals Risk of bias: All domain - Low, Selection - Low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 8.1: Epworth sleepiness scale – endpoint scores – NO META ANALYSIS PERFORMED - Actual outcome: Epworth sleepiness scale score – endpoint – No totals Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness Protocol outcome 8.2: Epworth sleepiness scale – change from baseline – NO META ANALYSIS PERFORMED - Actual outcome: Epworth sleepiness scale score – change from baseline – No totals Risk of bias: All domain - high, Selection - high, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - high, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: No indirectness	
Protocol outcomes not reported by the study	*None*

Study	Berry 2020[12]
Study type	RCT (Patient randomised)
Number of studies (number of participants)	1 (n=250) (Standard care, n= 126, standard care + cloud-based sleep coaches (CBSC), n= 124).
Countries and setting	Conducted in USA; Setting: hospital
Line of therapy	1st line
Duration of study	Intervention + 3 months follow up
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Age 21 to 75 years (men and women) Diagnostic apnea-hypopnea index ≥ 15 events/h (diagnostic polysomnography [PSG], diagnostic portion of split PSG, or home sleep apnea test) Eligible for treatment with automatically adjusting continuous positive airway pressure or bilevel positive airway pressure Residence in area covered by wireless network
Exclusion criteria	· Participation in another interventional research study concerned with sleep disorders within the last 30 days · Major uncontrolled medical condition that would interfere with the demands of the study, adherence to positive airway pressure (PAP), or the ability to commit to follow-up assessment including conditions such as poorly managed or controlled or advanced stages of pulmonary disease, cardiac disease, neurological disease, neuromuscular disease, cancer, and renal disease

Study	Berry 2020[12]
	· Prior PAP use within the previous 12 months · Predominantly central apnoea's (≥ 50% central apnoea's) or Cheyne Stokes respiration (CSR) present during ≥ 20% of total sleep time · Chronic respiratory failure or insufficiency with suspected or known neuromuscular disease, moderate chronic obstructive pulmonary disease, or any condition with an elevation of arterial carbon dioxide levels while awake or the requirement for continuous supplemental oxygen or mechanical ventilation · Surgery involving the upper airway, nose, sinus, eye, teeth, or middle ear within the previous 90 days · PAP therapy is otherwise medically complicated or contraindicated, such as those with a difficult to size or adjust interface (mask) resulting in facial pain, skin irritation or trauma, or excessive air leaks
Recruitment/selection of patients	Participants recruited at PAP set-up
Age, gender and ethnicity	Age: CBSC 54.9 ± 11.5 years; control: 55.2 ± 13.4 years AHI: CBSC 36.6 ± 20.6 events/h; control 36.7 ± 21.1 events/h Gender male %: CBSC 88.7%; control 89.7%
Further population details	Sleepiness: ESS: CBSC 11.2 ± 6.0; control 10.8 ± 6.1
Indirectness of population	No indirectness
Interventions	(n=124) Intervention 1: Cloud-based sleep coach (CBSC) Participants randomised to SC+CBSC follow-up received all elements of standard care and, in addition, interaction/communication from the CBSC service. The participants were informed that they would receive a telephone call from the CBSC system in 3 to 4 days to discuss their experience with therapy. Further contact from the CBSC could be expected if their adherence goals were not reached. All participants received calls on

Study	Berry 2020[12]
	day 3 to 4 and on day 32 after PAP initiation. The participants were also provided with information on, and encouraged to use, the mobile application (PAPapp), allowing them to view their current adherence. (n=126) Intervention 2: standard care Participants attending PAP setup classes were educated about use of their PAP device, including cleaning, ramp option, and humidification. All patients were encouraged to use therapy nightly for as long as they can, preferably for the entire time they sleep. Each participant was fitted with a mask based on physician order, participant preference, and the ability to obtain a good mask seal. The type of PAP device (autoadjusting CPAP or auto-adjusting bilevel PAP) and pressure settings were determined by physician order. Participants practiced putting on their masks and turning on the PAP device. All devices contained wireless modems with information accessed via a cloud-based programme. Device data were uploaded into the database via wireless modems programmed to call in automatically. Device data were associated with the individual participant based upon the serial number of the device and modem entered by the staff. All PAP devices had the ability to deliver heated humidification. At the PAP setup class, participants received information about the PAPapp (written information also supplied with each PAP unit). Participants were provided with telephone numbers for PAP supply replacement and for PAP treatment issues. They were also encouraged to use the secure messaging service “My Healthy Vet” to facilitate communication with the sleep providers. Participants had a 6-week inspection of adherence and efficacy data if ordered by the physician reading the sleep study. Pressure settings could be changed remotely based on physician order. A participant could be scheduled for an individual mask fitting CPAP RT appointment if discomfort or leak issues were significant. A 3-month (90 to 120 days) sleep clinic visit with a sleep provider (physician or physician extender) was scheduled.
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: CBSC versus standard care

Protocol outcome 1: adherence
- Actual outcome : Average use (all days) in hours at 3 months; Group 1: CBSC n= 124, (4.4 ± 2.6) ; Group 2: n= 126, (3.7 ± 2.7)
Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness

Study	Berry 2020[12]
Protocol outcome 2: adherence - Actual outcome : % Days > 4 hours at 3 months; Group 1: CBSC n= 124, (57.9 ± 35.4) ; Group 2: n= 126, (48.1 ± 36.8) Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness Protocol outcome 3: AHI (events/h) - Actual outcome : AHI at 3 months; Group 1: CBSC n= 124, (4.6 ± 4.3); Group 2: n= 126, (4.4 ± 3.9) Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness Protocol outcome 4: ESS - Actual outcome: ESS at 3 months; Group 1: CBSC n= 120, (8.9 ± 5.4) ; Group 2: n= 120,(8.3 ± 5.5) Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness	
Protocol outcomes not reported by the study	Quality of life at >1 month; Mortality at >1 month; CO2 control at >1 month; Driving outcomes at >1 month; Neurocognitive outcomes at >1 month; Systolic blood pressure for hypertension at >1 month; HbA1c for diabetes at >1 month

Study	Hanger 2018[34]
Study type	RCT (Patient randomised)
Number of studies (number of participants)	1 (n=56) (standard care, *n*=23); telemedicine (*n*=33).
Countries and setting	Conducted in USA; Setting: hospital
Line of therapy	1st line
Duration of study	Intervention + 3 months follow up

Study	Hanger 2018[34]
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	Adults, at least 18 years of age, newly diagnosed with moderate to severe OSA on HSAT or PSG; provision of CPAP device by DME with wireless data transmission capability and English speaking
Exclusion criteria	• Prior PAP use of any kind, including CPAP, APAP, bi-level or adaptive seroventilation • Current use of prescribed supplemental oxygen • Significant co-morbid medical condition(s) that could prevent/interfere with the participant using CPAP on a daily basis • Home location being outside of wireless capability • Sleep environment where the participant does not sleep in the same location on a frequent basis
Recruitment/selection of patients	Participants in the study were adults who had recently been diagnosed with moderate to severe obstructive sleep apnoea through a home sleep apnoea test (HSAT) or in-lab polysomnography (PSG), based on AASM criteria of an apnoea-hypopnea index (AHI) ≥15 as moderate OSA and an AHI of ≥30 as severe OSA. Participants were prescribed treatment with positive airway pressure (PAP) therapy. Participants were recruited into the study from February 21 through June 30, 2018. Data monitoring was completed on October 3, 2018
Age, gender and ethnicity	Age (mean SD): medicine 60.0±14.2 ; control: 51.4±13.8 AHI: telemedicine38.0±21.1; control 37.27±18.8 Gender: female%: telemedicine 42 ; control 42.1
Further population details	Sleepiness: ESS: telemedicine 8.8±4.9 ; control 11.3±5.5

Study	Hanger 2018[34]
Indirectness of population	No indirectness
Interventions	(n=23) Intervention 1: Telemedicine care group (TM). In addition to standard care, participants randomised to the TM group received the intervention, which entailed an initial call to all participants after one week of PAP therapy. CPAP usage data was monitored weekly via a web-based database. Use of CPAP of less than 4 hours per night, on less than 70% of nights (or more than 2 days), in the preceding week of monitoring, was considered non-adherent and triggered a phone call from the research coordinator to provide support and troubleshooting as needed. Participants were seen back in clinic after 6 weeks, per standard care. Data monitoring, as outlined above, continued for the first 3 months of CPAP usage. The study period culminated with a phone call, by the author, to all participants from both study arms, at the end of 3 months, to discuss any questions or concerns and to survey satisfaction of their follow-up care. (n=23) Intervention 2: Standard care Participants in the standard care (SC) group received the standard follow-up regimen currently used by the Sleep Center. Following diagnosis of moderate or severe OSA and the participant was prescribed CPAP therapy. Patients obtained equipment; they were fitted with a mask and given instructions on set up, use and care of the PAP machine. Devices were equipped with wireless data transmission technology. Patients were advised to call for any equipment concerns and the Sleep Center with any other concerns or questions related to PAP use; they were seen back in clinic after 6 weeks to discuss adherence and efficacy, review device data, and to address any issues or questions they may have. If patients were doing well, they were seen back yearly for monitoring, with more frequent follow-up if needed.
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: Telemedicine versus standard care

Protocol outcome 1: adherence
- Actual outcome : non-adherence at 3 months; Group 1: n= 25, (2/25) ; Group 2: n=19, 3/19
Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness

Study	Hanger 2018[34]
Protocol outcome 2: AHI - Actual outcome :AHI at 3 months; Group 1: n= 25, (4.1±3.0) ; Group 2: n=19, (3.4±3.8) Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness Protocol outcome 3: ESS - Actual outcome :ESS at 3 months; Group 1: n= 25, (4.0±2.7); Group 2: n=19, (6.5±4.1) Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness Protocol outcome 4: Number of days used >4 hours - Actual outcome : Number of days used >4 hours at 3 months; Group 1: n= 25, (89.9±13.1); Group 2: n=19, (83.5±15.8) Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness	
Protocol outcomes not reported by the study	Quality of life at >1 month; Mortality at >1 month; CO2 control at >1 month; Driving outcomes at >1 month; Neurocognitive outcomes at >1 month; Systolic blood pressure for hypertension at >1 month; HbA1c for diabetes at >1 month

Study	Kotzian 2019[43]
Study type	RCT (Patient randomised)
Number of studies (number of participants)	1 (n=251 recruited; n=70 therapy relevant OSA, n=33 randomised)
Countries and setting	Conducted in Austria; Setting: hospital
Line of therapy	1st line
Duration of study	Intervention + follow up 1year

Study	Kotzian 2019[43]
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Moderate-severe
Subgroup analysis within study	Not applicable
Inclusion criteria	Subacute adult (19-70 years of age) stroke survivors (>1 months to <1 year post stroke) with a completed stroke confirmed by a neurologist based on the history of a sudden onset of a neurological deficit lasting longer than 24 h, the presence of a neurological deficit upon physical examination, and a brain lesion compatible with the neurological deficit in computerised tomography or MRI of the brain were included. For evaluation of OSA, eligible patients underwent in hospital sleep studies. Therapy relevant OSA was defined as showing an AHI >15 per hour of sleep, indicating moderate sleep apnoea.
Exclusion criteria	Patients unable to understand the protocol due to cognitive impairments ;patients with COPD; chronic kidney disease >4; co-existing causes of daytime sleepiness; experiences of major psychiatric or any other acute medical condition; previously established PAP therapy; patients with central sleep apnoea; and patients unable or unwilling to comply with the protocol.
Recruitment/selection of patients	The study was conducted in Vienna, Austria from April 18 2016 to April 18 2018. All people with stroke referred to rehabilitation were initially included in the study.
Age, gender and ethnicity	Age: telemonitoring: 62.9 (5.3 years); control: 61.8 (5.3) years Gender: male: telemonitoring 64.7% : control: 75%
Further population details	1. BMI: telemonitoring: 30.9 kg/m^2 (4.8) : control: 29 kg/m^2 (3.1) 2. AHI: telemonitoring: 37 (14.1): control: 37 (12.8)
Indirectness of population	No indirectness
Interventions	(N=17)Intervention 1: tele medical monitoring system to improve CPAP adherence All patients referred to PAP therapy received a 30 min introductory lesson with nasal or oro-nasal mask fitting, device handling and information about PAP therapy. Patients were provide with an AirSendse 10 Autoset CPAP

Study	Kotzian 2019[43]
	including humidifier and were set to auto-titrate at pressures between 6 and 13 cm H20. Patients were motivated to use the PAP device for at least 4h of sleep/night. The PAP training period lasted at least one week, with bedside coaching in the morning and the evening. During the night the patients were coached by trained nurses. Relatives were also trained in using the humidifier and cleaning the mask and the humidifier chamber. The AHI, oximetry and leakage information were collected every day in coaching sessions with the patient. Pressure limits could be increased or decreased to improve patient comfort. If the patient had problems to tolerate high pressures while falling asleep in the first week, the fixed window was reduced to sub-therapeutic pressures (e.g. 4-8 mbar) for a few nights to enable the patient to get used to therapy. If the Autoset PAP device did not react to obstructive events, titration was too slow or did not decrease; either a fixed CPAP or a narrow Auto CPAP window was attached. Those who tolerated PAP therapy with a median PAP use of >4h/night underwent PSG with PAP. The PAP coordinator at the homecare provider reviewed the downloaded information every morning except on weekends and holidays and contacted the patients if the 90th percentile of pressure was >16 com H20 or mask leakage of the 95th percentile was >24l/min or use was <4h or the AHI was >10 events/h for three consecutive days. (n=16) Intervention 2: Standard PAP treatment. No tele medical monitoring system Both groups: Patients were asked to call their homecare provider if any problems with the device occurred or their physician in case of medical problems. Two days after discharge from return to the hospital they were contacted by their homecare provider and were asked about progress and adherence, as well as about any other problems. They were asked to return to the hospital after 3 months for evaluation therapy including review of PAP pressure, mask leakage, residual respiratory events and compliance.
Funding	This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: telemonitoring system versus no telemonitoring system
Protocol outcome 1: Days PAP used >4 h
- Actual outcome : Days PAP used >4 h [mean SD] at 12 months; Group 1: n=12; 271 (99), Group 2: ; n=11; 282 (55)
Risk of bias: All domain - high, Selection - high,, Blinding - Low, Incomplete outcome data - high,, Outcome reporting - Low, Measurement - Low, Crossover -

Study	Kotzian 2019[43]
Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: serious; Group 1 Number missing: 5 (lost to follow up due to medical reason=1, discontinued intervention due to discomfort device =4), Group 2 Number missing: 5 (Lost to follow up due to medical reason = 2, discontinued intervention due to discomfort with device =3) Protocol outcome 2: AHI - Actual outcome: AHI [mean SD] at 12 months ; Group 1: n=12 : 4.2 (3.9), Group 2 (n=11): 1.6 (1.3) Risk of bias: All domain - high,, Selection - high, Blinding - Low, Incomplete outcome data - high,, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: serious; Group 1 Number missing: 5 (lost to follow up due to medical reason=1, discontinued intervention due to discomfort device =4), Group 2 Number missing: 5 (Lost to follow up due to medical reason = 2, discontinued intervention due to discomfort with device =3) Protocol outcome 3: adherence - Actual outcome : Mean adherence all days (min per day) [mean SD] at 12 months ; Group 1: n=12, 352 (97) Group 2: n=11, 307 (62) Risk of bias: All domain - high, Selection - high,, Blinding - Low, Incomplete outcome data - high, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: serious; Group 1 Number missing: 5 (lost to follow up due to medical reason=1, discontinued intervention due to discomfort device =4), Group 2 Number missing: 5 (Lost to follow up due to medical reason = 2, discontinued intervention due to discomfort with device =3)	
Protocol outcomes not reported by the study	Quality of life at >1 month; Mortality at >1 month; Sleepiness score at >1 month;; CO2 control at >1 month; Driving outcomes at >1 month; self-reported adherence (continuous), mood or anxiety, withdrawals, treatment related withdrawals , oxygen desaturation index , minor adverse effects of treatment Neurocognitive outcomes at >1 month; Systolic blood pressure for hypertension at >1 month; HbA1c for diabetes at >1 month

Study	Murase 2020[57]
Study type	RCT (Patient randomised)
Number of studies (number of participants)	1 (n=508)
Countries and setting	Conducted in Japan; Setting: hospital
Line of therapy	1st line

Study	Murase 2020[57]
Duration of study	Intervention + follow up
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Overall
Subgroup analysis within study	Not applicable
Inclusion criteria	The criteria for patient inclusion were >18 years old; fulfilled the requirements for CPAP treatment under Japanese governmental health insurance (AHI>20/h by PSG or respiratory event index >40/h by portable monitoring device at OSA diagnosis; CPAP implemented more than 3 months previously; residual AHI under CPAP use<20/h; having clinic visits every month or every 2 months for follow-up of CPAP therapy; recent CPAP adherence data available.
Exclusion criteria	Not stated
Recruitment/selection of patients	Participants were consecutively recruited from patients who were regularly visiting hospitals or clinics for CPAP management.
Age, gender and ethnicity	Age: telemedicine group: 60 (11); control: 60 (13) years AHI: telemedicine: 40.6; control 40.6 Gender: male%: telemedicine 87%; control 86.1%
Further population details	1. BMI: telemedicine: 27.4 kg/m^2 (3.8); control: 27kg/m^2 (5.4) 2. Sleepiness: ESS: telemedicine 5.7 (4.0); 4.9 (2.3)
Indirectness of population	No indirectness
Interventions	(n=161) Intervention 1: telemedicine group Physician checked adherence data utilising the telemonitoring system.

Study	Murase 2020[57]
	Follow-every 3 months. (3 months n= 166; 1 month, n=156) Intervention 2: No telemedicine Follow-up 1 month and 3 months
Funding	Funding not stated
RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: telemonitoring system versus no telemonitoring Protocol outcome 1: adherence - Actual outcome : CPAP use min/night ; Group 1: n= 161, 327(91); Group 2: n=166, 307 (107) Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness	
Protocol outcomes not reported by the study	Quality of life at >1 month; Mortality at >1 month; Sleepiness score at >1 month; AHI/RDI at >1 month; CO2 control at >1 month; Driving outcomes at >1 month; Neurocognitive outcomes at >1 month; Systolic blood pressure for hypertension at >1 month; HbA1c for diabetes at >1 month

Study	Nilius 2019[61]
Study type	RCT (Patient randomised)
Number of studies (number of participants)	1 (n=80)
Countries and setting	Conducted in Germany ; Setting: hospital
Line of therapy	1st line

Study	Nilius 2019[61]
Duration of study	Intervention + follow up
Method of assessment of guideline condition	Adequate method of assessment/diagnosis
Stratum	Moderate severe OSA
Subgroup analysis within study	Not applicable
Inclusion criteria	Patients who had suffered an ischaemic stroke within last 3 months; a moderate to severe baseline OSA with an AHI>15, that had been confirmed in the sleep laboratory; physical capability to operate a PAP device and mask; age<75;CPAP naïve; no COPD; and regular PAP usage (<3h/night) during the inpatient phase.
Exclusion criteria	Not stated
Recruitment/selection of patients	Patients were informed about the study during the first anamnesis upon being admitted to hospital. In case of a positive diagnosis of moderate to severe sleep apnoea (AHI>15/h), the patients received a positive pressure device.
Age, gender and ethnicity	Age: telemedicine 55.4 (10.4) years; control: 58.6 (9.3) years Gender: all females ethnicity: not stated
Further population details	1. BMI: telemedicine 31.7 kg/m^2 (5.4); control 30.1kg/m^2 (6.6) ; Sleepiness ESS: telemedicine 2.4 (3.7); 3.9 (4.9); AHI: 41.2 (19); control: 37.6 (18.4)
Indirectness of population	No indirectness
Interventions	(n=37) Intervention 1: telemedicine Therapy was uniformly initiated in all eligible patients that is after a positive PSG., patients were visited by sleep lab staff, and a training session and mask adjustment followed before the initial therapy PSG. The device used was usually an APAP device set to a pressure 4-18 cm H20.

Study	Nilius 2019[61]
	The online data of the telemedicine group was anonymously transferred to the password protected web server each morning. The data was evaluated for relevant therapy details each week starting 7 days after the individual discharge date of each patient. (n=38) Intervention 2: No intervention – Standard care All patients went home with a PAP device and the sleep lab informed the homecare provider about the therapy settings and equipment. The patients were advised to visit their primary care physician or lung specialist if they experienced any problem. Follow-up 6 months
Funding	Funding not stated

RESULTS (NUMBERS ANALYSED) AND RISK OF BIAS FOR COMPARISON: versus

Protocol outcome 1: Usage hours/night
- Actual outcome : ; Group 1: n=37, 4.4 (2.5); Group 2: ; n=38, 2.1 (2.2)
Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness .

Protocol outcome 2: ESS
- Actual outcome:; Group 1: n=36, 3.7 (3.2) Group 2: ; n=37, 6.1 (4.1)
Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness .

Protocol outcome 3: Systolic blood pressure-
- Actual outcome:; Group 1: n=26, 129.5 (15.2);Group 2: ; n=29, 138.8 (16.1)
Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness.

Protocol outcome 4: diastolic blood pressure-
- Actual outcome:; Group 1: n=26, G 78.4 (11.1); group 2: ; n=29, 82.8 (9.2)

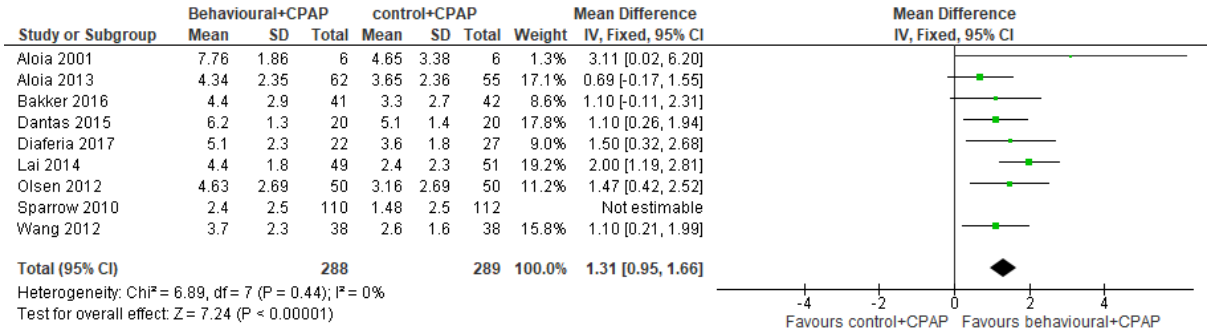
Study	Nilius 2019[61]
Risk of bias: All domain - low, Selection - low, Blinding - Low, Incomplete outcome data - Low, Outcome reporting - Low, Measurement - Low, Crossover - Low, Subgroups - Low, Other 1 - Low, Other 2 - Low, Other 3 - Low; Indirectness of outcome: no indirectness.	
Protocol outcomes not reported by the study	Quality of life at >1 month; Mortality at >1 month; Driving outcomes at >1 month; Neurocognitive outcomes at >1 month; HbA1c for diabetes at >1 month

Appendix E: Forest plots

E.1 Adherence for CPAP

E.1.1 Behavioural therapy + CPAP versus control + CPAP –severe OSAHS

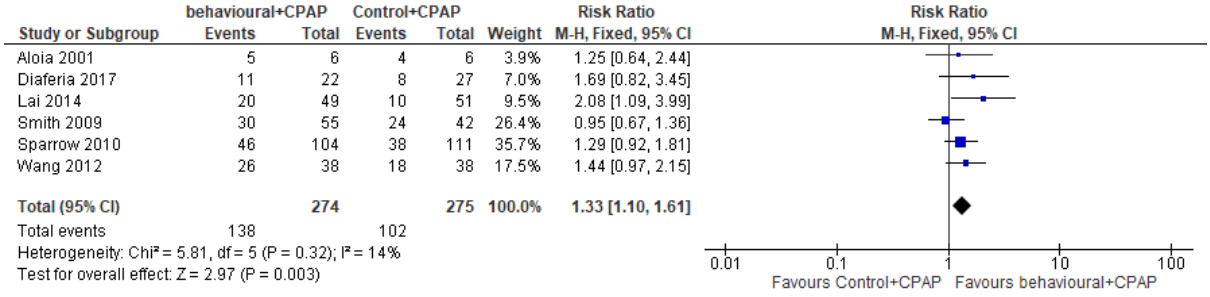
Figure 2: CPAP Device Usage (hours/night) (higher is better)



Study or Subgroup	Behavioural+CPAP Mean	SD	Total	control+CPAP Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Aloia 2001	7.76	1.86	6	4.65	3.38	6	1.3%	3.11 [0.02, 6.20]
Aloia 2013	4.34	2.35	62	3.65	2.36	55	17.1%	0.69 [-0.17, 1.55]
Bakker 2016	4.4	2.9	41	3.3	2.7	42	8.6%	1.10 [-0.11, 2.31]
Dantas 2015	6.2	1.3	20	5.1	1.4	20	17.8%	1.10 [0.26, 1.94]
Diaferia 2017	5.1	2.3	22	3.6	1.8	27	9.0%	1.50 [0.32, 2.68]
Lai 2014	4.4	1.8	49	2.4	2.3	51	19.2%	2.00 [1.19, 2.81]
Olsen 2012	4.63	2.69	50	3.16	2.69	50	11.2%	1.47 [0.42, 2.52]
Sparrow 2010	2.4	2.5	110	1.48	2.5	112		Not estimable
Wang 2012	3.7	2.3	38	2.6	1.6	38	15.8%	1.10 [0.21, 1.99]
Total (95% CI)			**288**			**289**	**100.0%**	**1.31 [0.95, 1.66]**

Heterogeneity: Chi² = 6.89, df = 7 (P = 0.44); I² = 0%
Test for overall effect: Z = 7.24 (P < 0.00001)

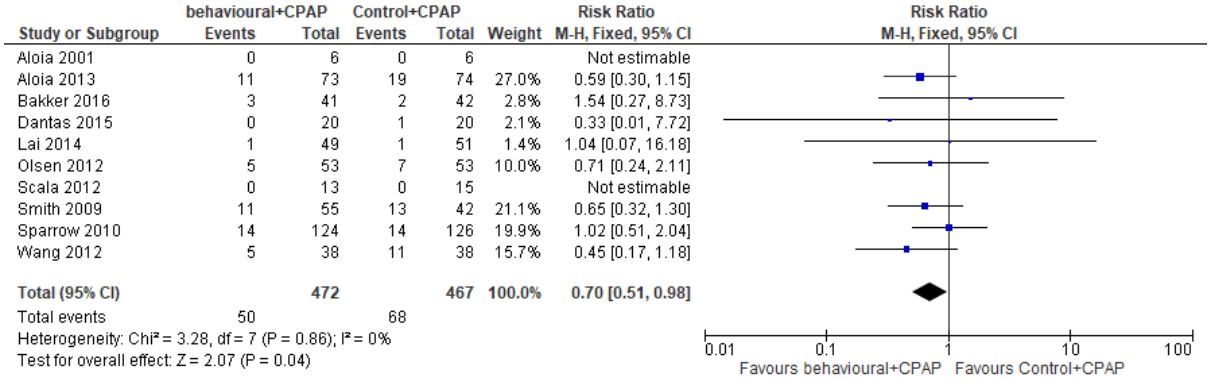
Figure 3: N deemed adherent (≥ four hours/night)



Study or Subgroup	behavioural+CPAP Events	Total	Control+CPAP Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Aloia 2001	5	6	4	6	3.9%	1.25 [0.64, 2.44]
Diaferia 2017	11	22	8	27	7.0%	1.69 [0.82, 3.45]
Lai 2014	20	49	10	51	9.5%	2.08 [1.09, 3.99]
Smith 2009	30	55	24	42	26.4%	0.95 [0.67, 1.36]
Sparrow 2010	46	104	38	111	35.7%	1.29 [0.92, 1.81]
Wang 2012	26	38	18	38	17.5%	1.44 [0.97, 2.15]
Total (95% CI)		**274**		**275**	**100.0%**	**1.33 [1.10, 1.61]**
Total events	138		102			

Heterogeneity: Chi² = 5.81, df = 5 (P = 0.32); I² = 14%
Test for overall effect: Z = 2.97 (P = 0.003)

Figure 4: Withdrawal



Study or Subgroup	behavioural+CPAP Events	Total	Control+CPAP Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Aloia 2001	0	6	0	6		Not estimable
Aloia 2013	11	73	19	74	27.0%	0.59 [0.30, 1.15]
Bakker 2016	3	41	2	42	2.8%	1.54 [0.27, 8.73]
Dantas 2015	0	20	1	20	2.1%	0.33 [0.01, 7.72]
Lai 2014	1	49	1	51	1.4%	1.04 [0.07, 16.18]
Olsen 2012	5	53	7	53	10.0%	0.71 [0.24, 2.11]
Scala 2012	0	13	0	15		Not estimable
Smith 2009	11	55	13	42	21.1%	0.65 [0.32, 1.30]
Sparrow 2010	14	124	14	126	19.9%	1.02 [0.51, 2.04]
Wang 2012	5	38	11	38	15.7%	0.45 [0.17, 1.18]
Total (95% CI)		**472**		**467**	**100.0%**	**0.70 [0.51, 0.98]**
Total events	50		68			

Heterogeneity: Chi² = 3.28, df = 7 (P = 0.86); I² = 0%
Test for overall effect: Z = 2.07 (P = 0.04)

Figure 5: Epworth Sleepiness Scale (Endpoint scores) (0-24; higher is worse)

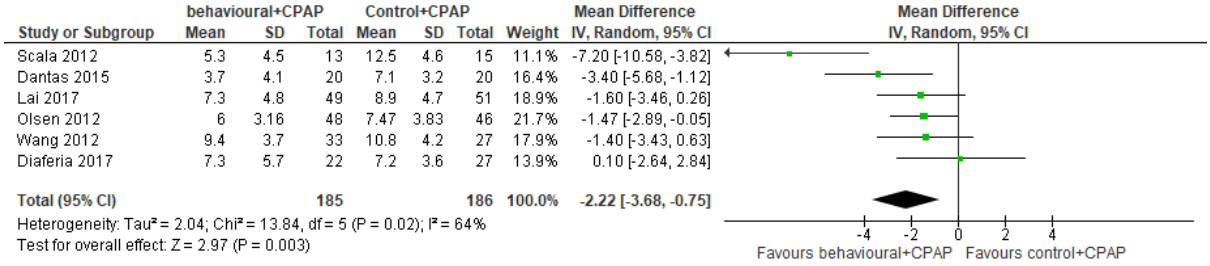


Figure 6: AHI on treatment – Endpoint (lower is better)

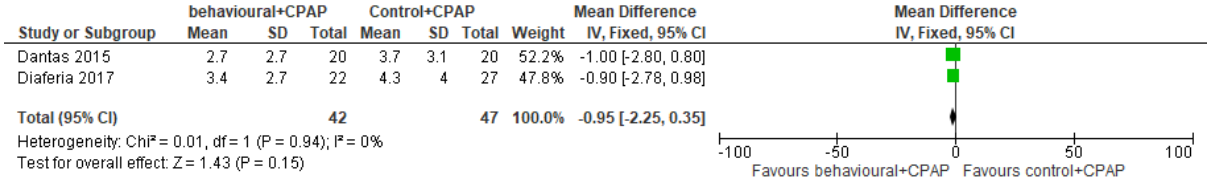
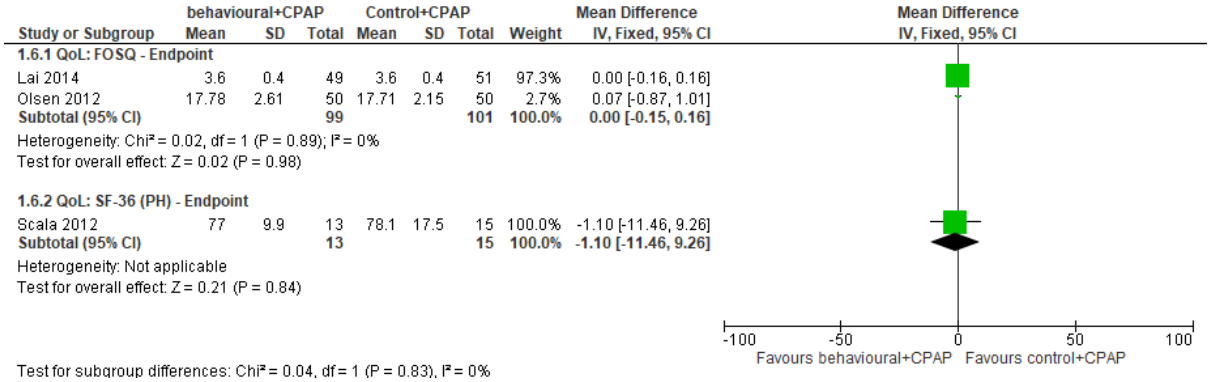


Figure 7: Quality of Life - Comparison of Values at Endpoint (FOSQ 5-20, higher is better) (SF- 36, 0-100, higher is better)



E.1.2 Educational interventions + CPAP versus usual care + CPAP- severe OSAHS

Figure 8: CPAP Device Usage (hours/night) (higher is better)

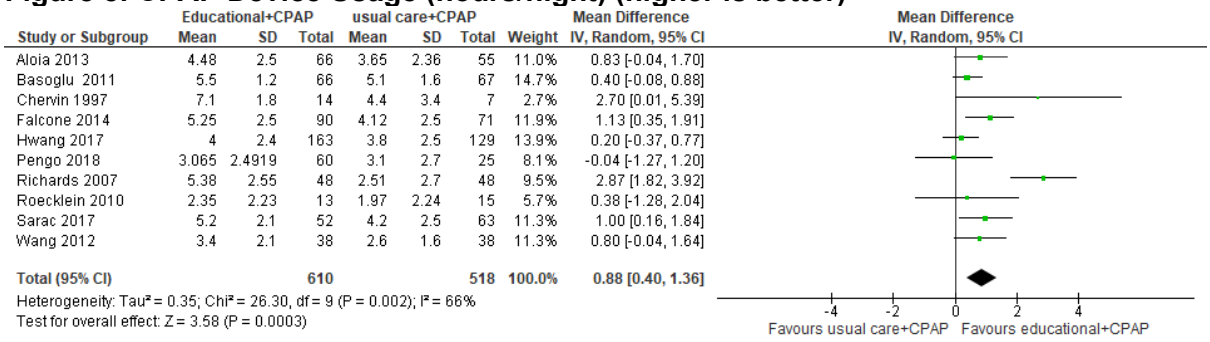


Figure 9: N deemed adherent (≥ four hours/night)

Study or Subgroup	Educational+CPAP Events	Total	usual care+CPAP Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Basoglu 2011	47	66	38	67	14.0%	1.26 [0.97, 1.63]
Falcone 2014	87	90	50	71	22.7%	1.37 [1.17, 1.60]
Hwang 2017	100	163	69	129	18.3%	1.15 [0.94, 1.40]
Richards 2007	37	48	15	48	6.4%	2.47 [1.58, 3.86]
Sarac 2017	45	52	43	63	18.5%	1.27 [1.04, 1.55]
Soares-Pires 2013	45	71	41	75	13.2%	1.16 [0.88, 1.52]
Wang 2012	23	38	18	38	7.0%	1.28 [0.84, 1.95]
Total (95% CI)		**528**		**491**	**100.0%**	**1.31 [1.15, 1.48]**
Total events	384		274			

Heterogeneity: Tau² = 0.01; Chi² = 10.66, df = 6 (P = 0.10); I² = 44%
Test for overall effect: Z = 4.18 (P < 0.0001)

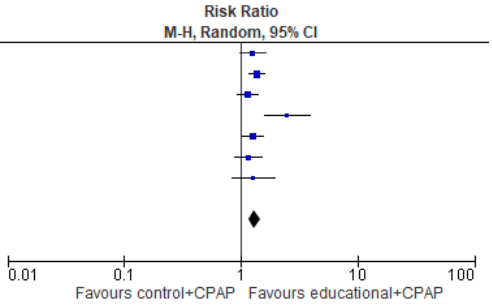


Figure 10: Withdrawals

Study or Subgroup	Educational+CPAP Events	Total	usual care+CPAP Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Aloia 2013	14	80	19	74	17.3%	0.68 [0.37, 1.26]
Basoglu 2011	0	66	0	67		Not estimable
Falcone 2014	13	103	32	103	18.3%	0.41 [0.23, 0.73]
Hwang 2017	51	375	53	354	27.9%	0.91 [0.64, 1.30]
Richards 2007	2	50	2	50	2.9%	1.00 [0.15, 6.82]
Roecklein 2010	1	14	1	16	1.5%	1.14 [0.08, 16.63]
Sarac 2017	0	52	0	63		Not estimable
Soares-Pires 2013	29	100	27	102	23.8%	1.10 [0.70, 1.71]
Wang 2012	4	38	11	38	8.2%	0.36 [0.13, 1.04]
Total (95% CI)		**878**		**867**	**100.0%**	**0.73 [0.52, 1.02]**
Total events	114		145			

Heterogeneity: Tau² = 0.07; Chi² = 10.12, df = 6 (P = 0.12); I² = 41%
Test for overall effect: Z = 1.84 (P = 0.07)

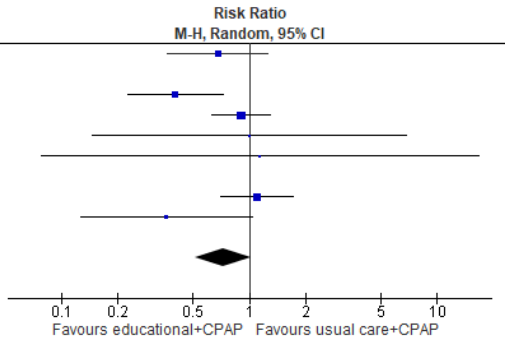
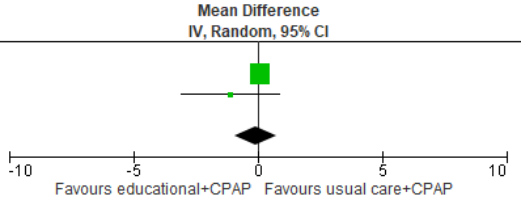


Figure 11: ESS – comparison of values at end point (0 to 24, higher is worse)

Study or Subgroup	Intervention Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Basoglu 2011	3.8	0	66	4.4	0	67		Not estimable
Falcone 2014	4.14	0.31	90	4.04	0.23	71	85.1%	0.10 [0.02, 0.18]
Wang 2012	9.7	3.5	34	10.8	4.2	27	14.9%	-1.10 [-3.07, 0.87]
Total (95% CI)			**190**			**165**	**100.0%**	**-0.08 [-0.92, 0.76]**

Heterogeneity: Tau² = 0.21; Chi² = 1.42, df = 1 (P = 0.23); I² = 29%
Test for overall effect: Z = 0.18 (P = 0.85)



E.1.3 Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP- severe OSAHS

Figure 12: CPAP Device Usage (hours/night) (higher is better)

Study or Subgroup	Increased support+CPAP Mean	SD	Total	usual care+CPAP Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Chervin 1997	5.7	2.3	12	4.4	3.4	7	1.6%	1.30 [-1.54, 4.14]
DeMolles 2004	4.4	3	15	2.9	2.4	15	3.1%	1.50 [-0.44, 3.44]
Fox 2012	3.18	2.45	28	1.75	1.97	26	6.2%	1.43 [0.25, 2.61]
Hoet 2017	5.7	1.6	20	4.2	1.9	17	6.4%	1.50 [0.36, 2.64]
Hoy 1999	5.4	1.8974	40	3.8	2.5298	40	7.5%	1.60 [0.62, 2.58]
Hwang 2017	4.4	2.2	125	3.8	2.5	129	11.0%	0.60 [0.02, 1.18]
Mendelson 2014	3.12	2.97	54	4.17	2.77	53	6.8%	-1.05 [-2.14, 0.04]
Munafo 2016	5.1	1.9	58	4.7	2.1	64	9.8%	0.40 [-0.31, 1.11]
Nilius 2019	4.4	2.5	37	2.1	2.2	38	6.9%	2.30 [1.23, 3.37]
Parthasarathy 2012	4.35	2.6	22	3.4	2.6	15	3.8%	0.95 [-0.76, 2.66]
Pepin 2019	5.28	2.23	157	4.75	2.5	149	11.5%	0.53 [-0.00, 1.06]
Stepnowsky 2007	4.1	1.8	20	2.8	2.2	20	5.8%	1.30 [0.05, 2.55]
Stepnowsky 2013	3.9	2.3	126	3.2	2.4	114	10.9%	0.70 [0.10, 1.30]
Turino 2017	5.1	2.1	52	4.9	2.2	48	8.6%	0.20 [-0.64, 1.04]
Total (95% CI)			**766**			**735**	**100.0%**	**0.83 [0.45, 1.22]**

Heterogeneity: Tau² = 0.26; Chi² = 29.44, df = 13 (P = 0.006); I² = 56%
Test for overall effect: Z = 4.23 (P < 0.0001)

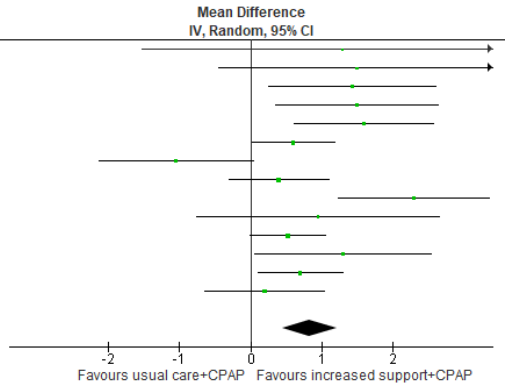


Figure 13: Days PAP used >4 h at 12 months

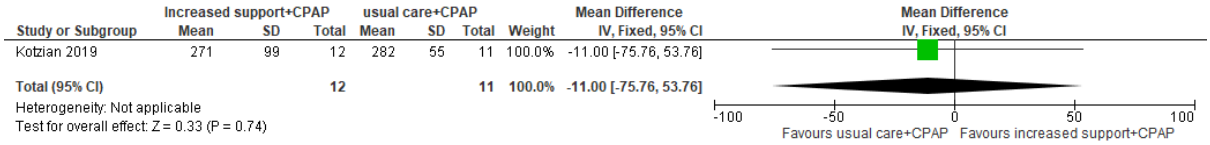


Figure 14: Days PAP used >4 h at 3 months

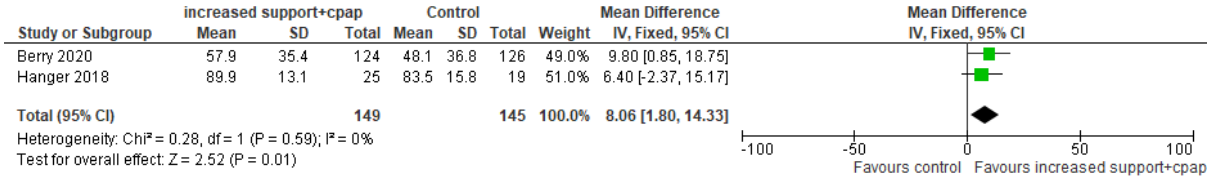


Figure 15: Mean adherence all days (min per day)

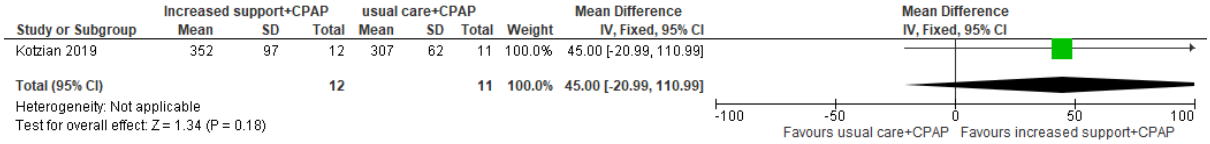


Figure 16: CPAP use min/night

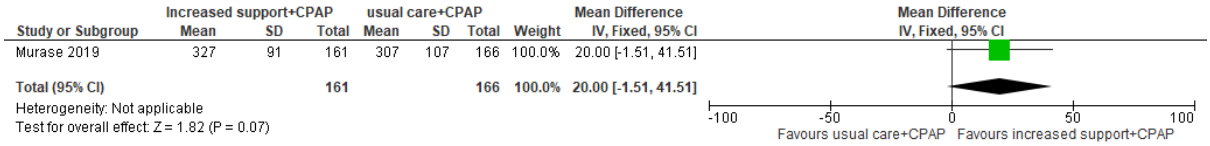


Figure 17: N deemed adherent (≥ four hours/night)

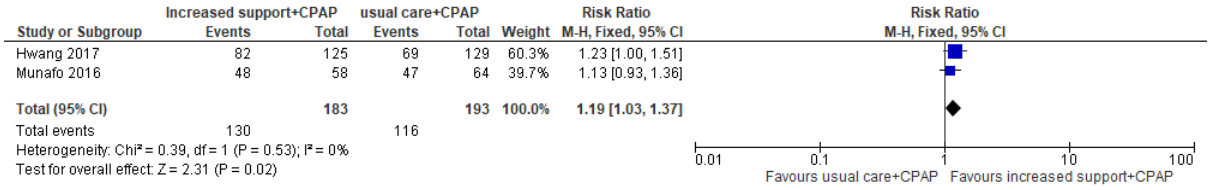


Figure 18: Withdrawals

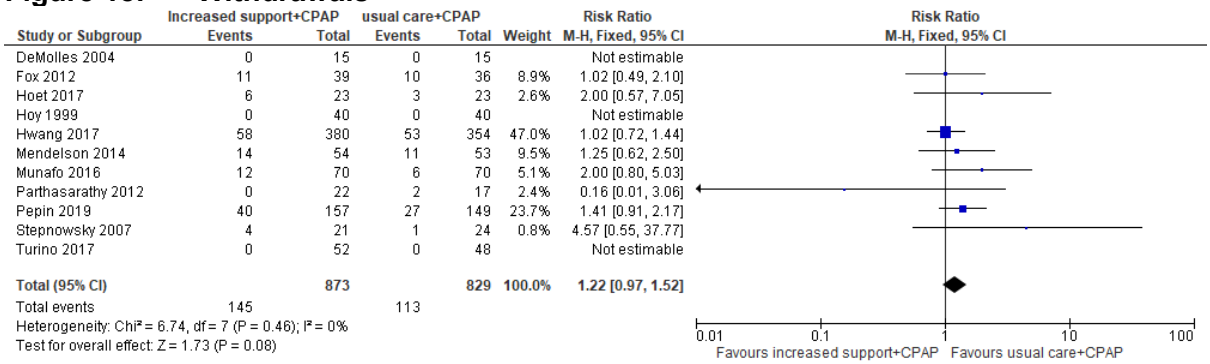


Figure 19: ESS score – end point and change from baseline (0-24; higher is worse)

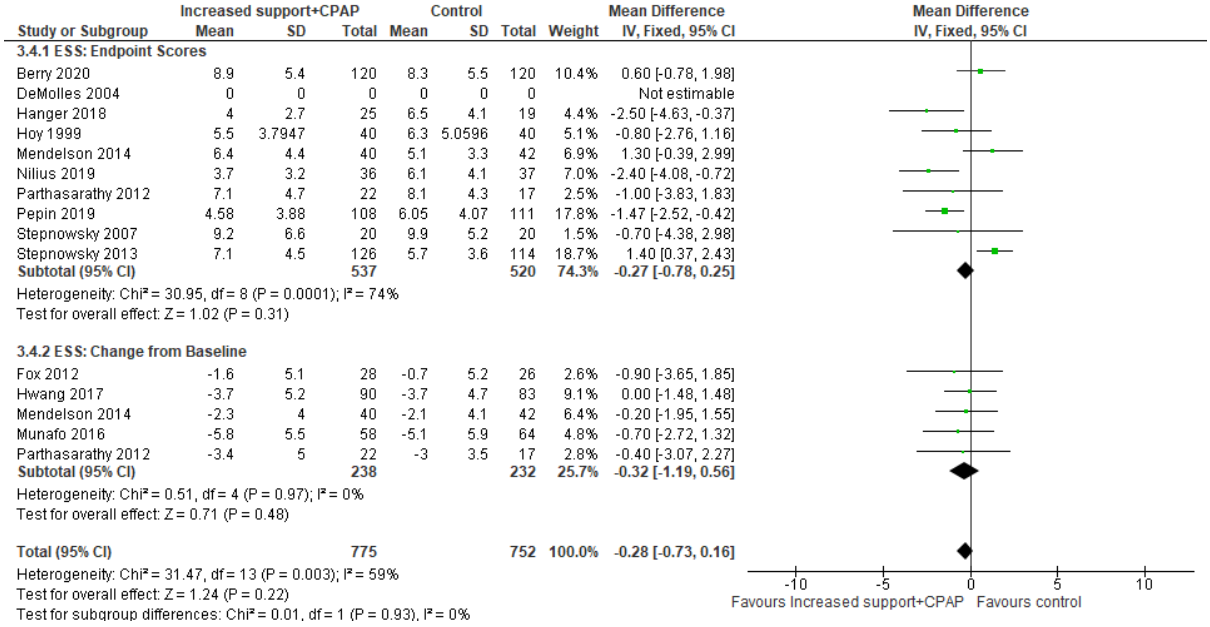


Figure 20: Quality of Life: Comparison of Values at Endpoint (FOSQ 5-20; higher is better, SF-36 0-100; higher is better)

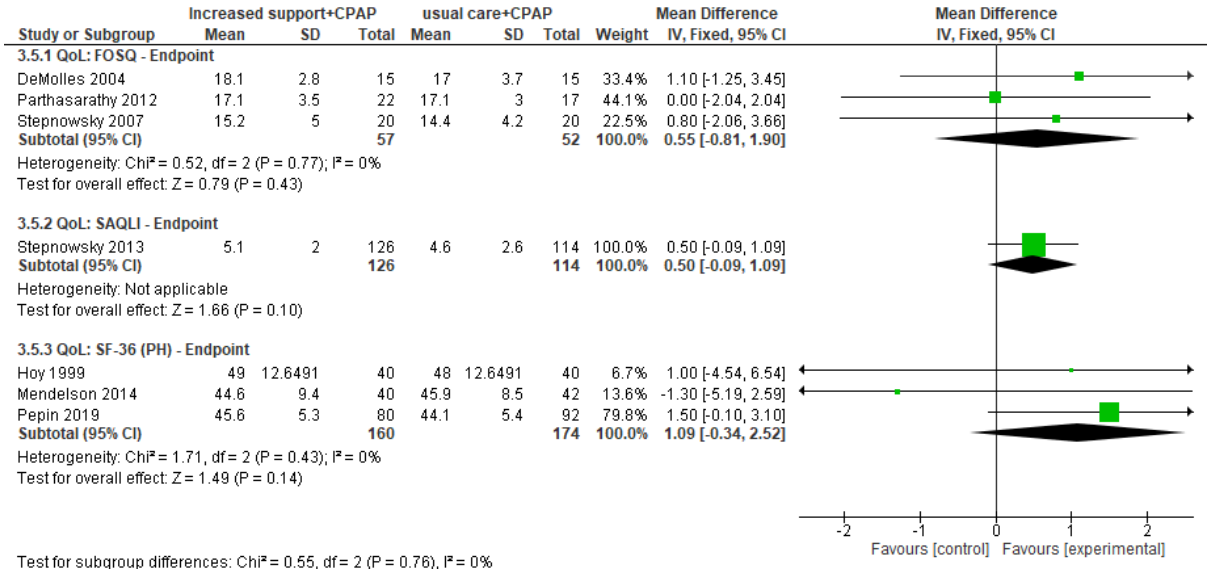


Figure 21: Quality of Life: Comparison of Change from Baseline Values(FOSQ, 5-20; higher is better, SF-36 0-100; higher is better)

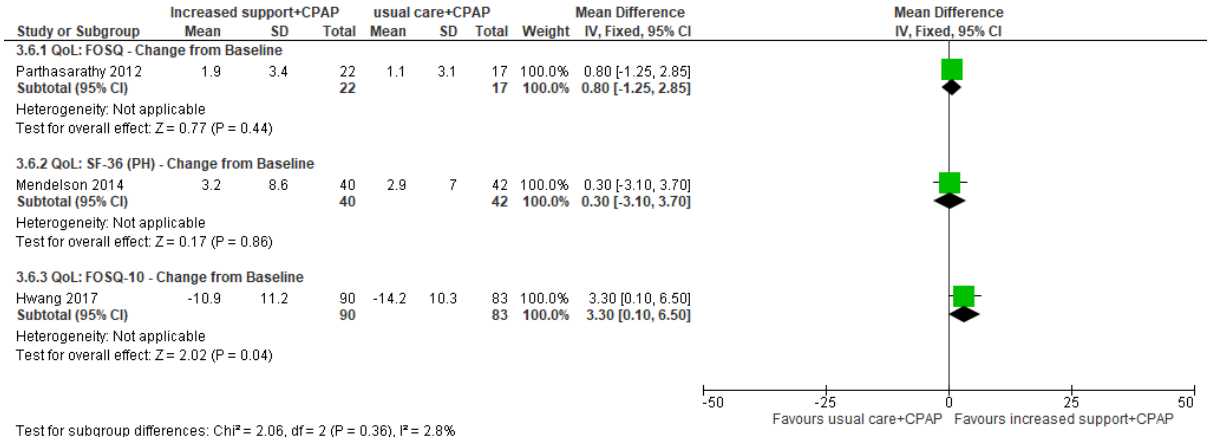


Figure 22: diastolic blood pressure

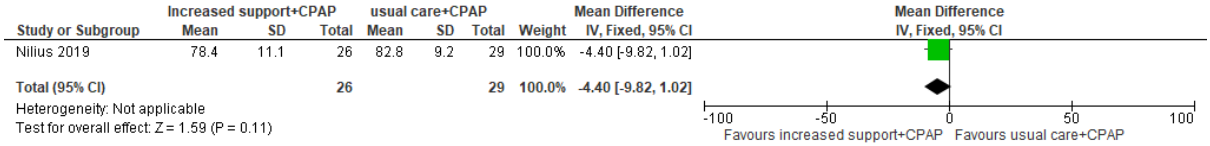


Figure 23: systolic blood pressure

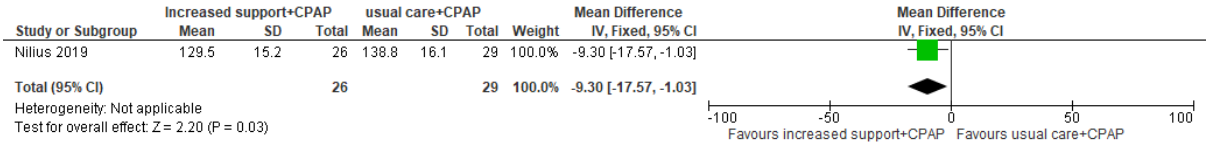
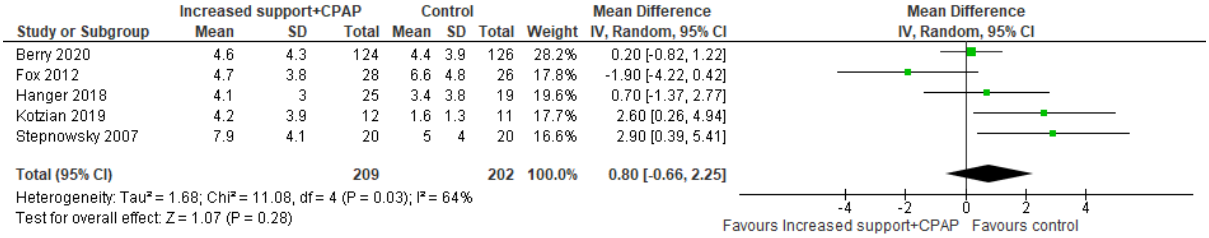


Figure 24: AHI on treatment- comparison of values at end point (lower is better)



E.1.4 Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP- severe OSAHS

Figure 25: CPAP Device Usage (hours/night) (higher is better)

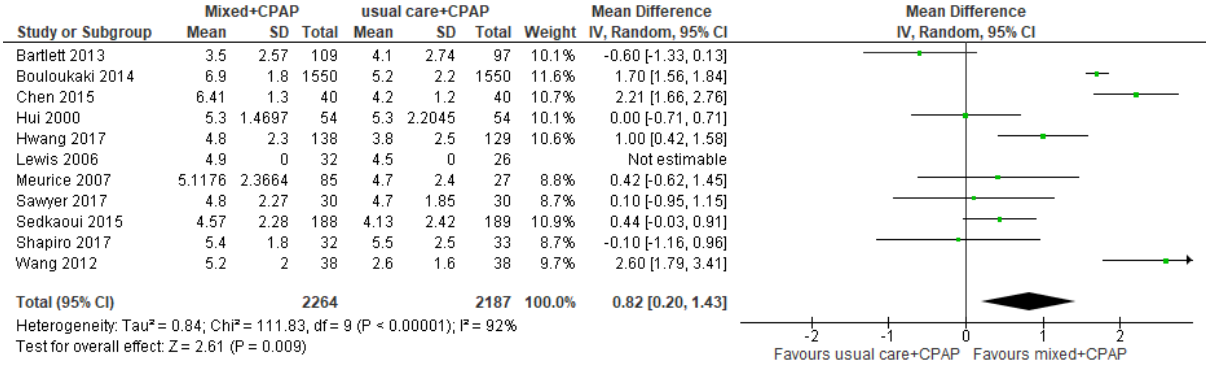


Figure 26: N deemed adherent (≥ four hours/night)

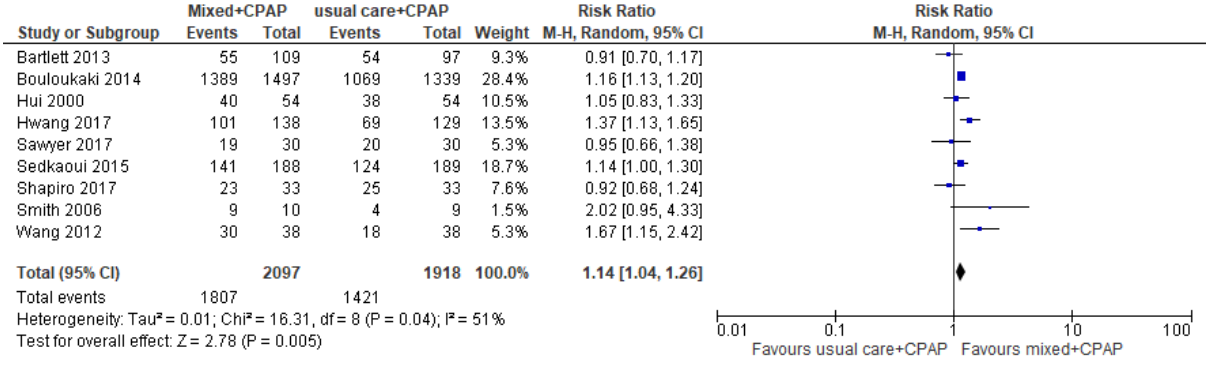


Figure 27: Withdrawal

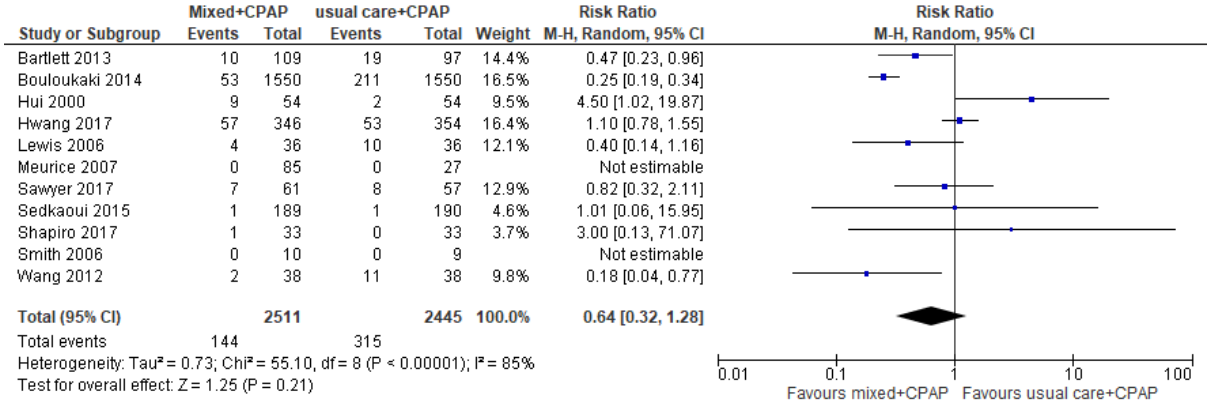


Figure 28: Quality of Life: Comparison of Change from Baseline Values (FOSQ, 5-20; higher is better, SF-36 0-100; higher is better)

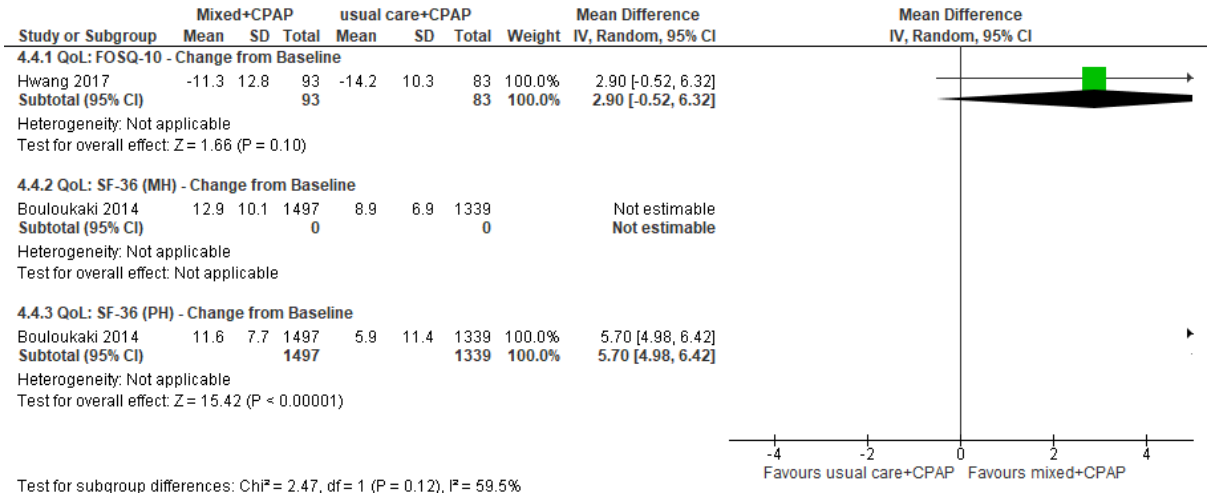


Figure 29: Quality of Life: Comparison of Values at Endpoint (FOSQ, 5-20; higher is better, SF-36 0-100; higher is better)

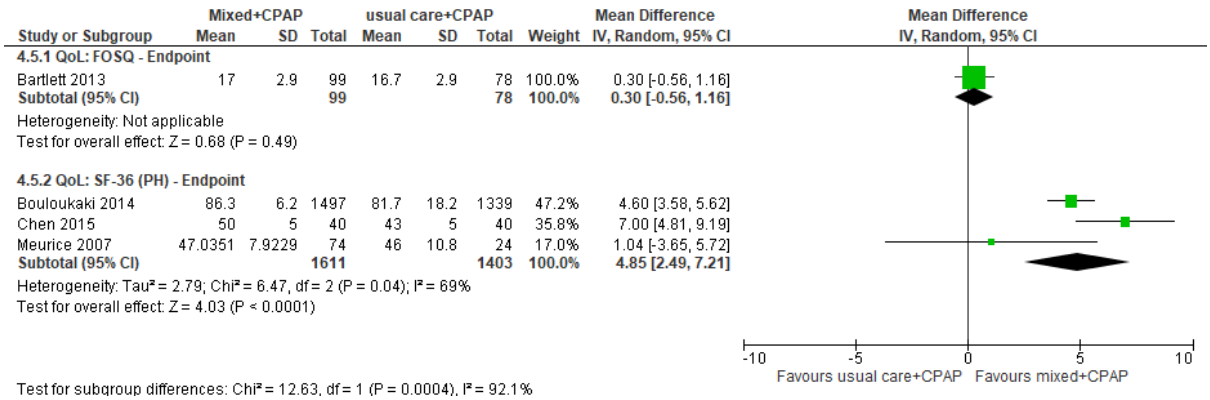
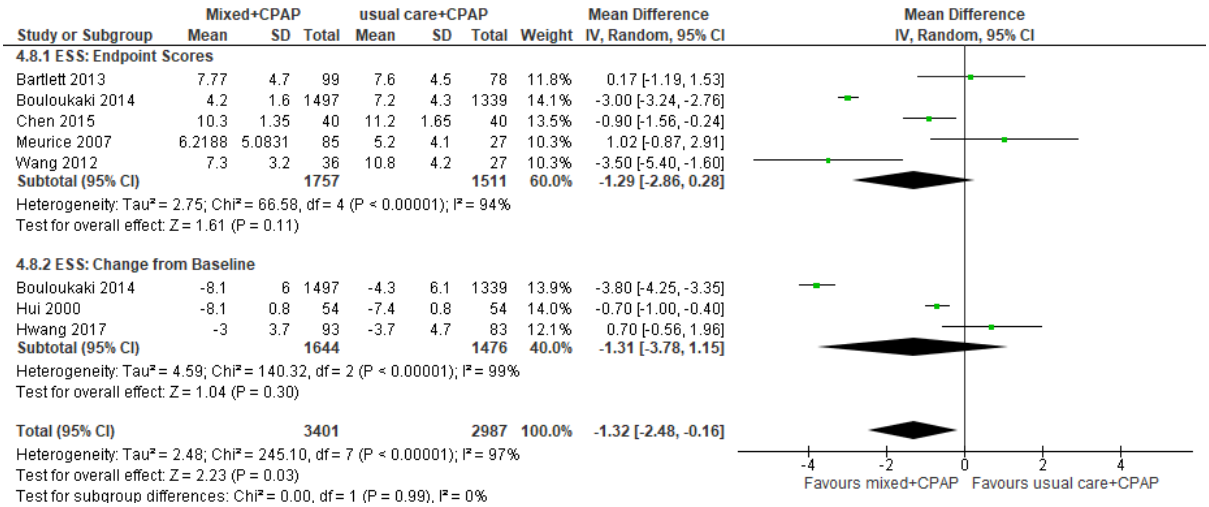


Figure 30: ESS score (0-24; higher is worse)



Appendix F: GRADE tables

Table 11: Clinical evidence profile: Behavioural therapy + CPAP versus control + CPAP - severe OSAHS

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Behavioural therapy + CPAP versus control + CPAP	Control	Relative (95% CI)	Absolute		
CPAP Device Usage (hours/night) (Better indicated by higher values)												
9	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	serious[2]	None	288	289 Median: 3.65	-	MD 1.31 higher (0.95 to 1.66 higher)	⊕OOO VERY LOW	CRITICAL
N deemed adherent (≥ four hours/night)												
6	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	serious[2]	None	138/274 (50.4%)	40.8%	RR 1.33 (1.1 to 1.61)	135 more per 1000 (from 41 more to 249 more)	⊕OOO VERY LOW	CRITICAL
Withdrawal												
10	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	serious[2]	None	50/472 (10.6%)	8.1%	RR 0.7 (0.51 to 0.98)	24 fewer per 1000 (from 2 fewer to 40 fewer)	⊕OOO VERY LOW	IMPORTANT
Epworth Sleepiness Scale (Endpoint scores) (Better indicated by lower values)												

6	randomised trials	serious[1]	serious[3]	serious indirectness[4]	serious[2]	None	185	186	-	MD 2.22 lower (3.68 to 0.75 lower)	⊕OOO VERY LOW	IMPORTANT
AHI on treatment - Endpoint (Better indicated by lower values)												
2	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	very serious[2]	None	42	47	-	MD 0.95 lower (2.25 lower to 0.35 higher)	⊕OOO VERY LOW	IMPORTANT
Quality of Life - Comparison of Values at Endpoint FOSQ (PH) (Better indicated by higher values)												
2	randomised trials	serious[1]	no serious inconsistency	serious[4]	no serious imprecision	None	99	101	-	MD 0 higher (0.15 lower to 0.16 higher)	⊕⊕OO LOW	CRITICAL
Quality of Life - Comparison of Values at Endpoint SF-36 (PH) (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	serious[4]	no serious imprecision	None	13	15	-	MD 1.1 lower (11.46 lower to 9.26 higher)	⊕⊕OO LOW	CRITICAL
Mortality												
Not reported												CRITICAL

[1] Downgraded by 1 increment if the majority of the evidence was at high risk of bias and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
2 Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour ; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5;SAQLI – 2. GRADE default MID (0.5XSD)used for all other continuous outcomes.
3 Downgraded by 1 or 2 increments for heterogeneity, unexplained by subgroup analysis . Random effect analysis used.
4 Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively

Table 12: Clinical evidence profile: Educational interventions + CPAP versus usual care + CPAP - severe OSAHS

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Educational interventions + CPAP versus usual care + CPAP	Control	Relative (95% CI)	Absolute		
CPAP Device Usage (hours/night) (Better indicated by higher values)												
10	randomised trials	serious[1]	serious[2]	serious indirectness[4]	serious[3]	None	610	518	-	MD 0.88 higher (0.4 to 1.36 higher)	⊕OOO VERY LOW	CRITICAL
N deemed adherent (≥ four hours/night)												
7	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	serious[3]	None	384/528 (72.7%)	54.7%	RR 1.31 (1.15 to 1.48)	170 more per 1000 (from 82 more to 263 more)	⊕OOO VERY LOW	CRITICAL
Withdrawal												
9	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	no serious imprecision	None	114/878 (13%)	15%	RR 0.73 (0.52 to 1.02)	41 fewer per 1000 (from 72 fewer to 3 more)	⊕⊕OO LOW	IMPORTANT
Epworth Sleepiness Scale - Comparison of Values at Endpoint- (Better indicated by lower values)												
3	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	no serious imprecision	None	190	165	-	MD 0.08 lower (0.92 lower to 0.76 higher)	⊕OOO VERY LOW	IMPORTANT
Mortality												

Not reported												CRITICAL

[1] Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
[2] Downgraded by 1 or 2 increments for heterogeneity, unexplained by subgroup analysis. Random effect analysis used.
[3] Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour ; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5;SAQLI – 2. GRADE default MID (0.5XSD)used for all other continuous outcomes.

4 Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively

Table 13: Clinical evidence profile: Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP - severe OSAHS

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Increased practical support and encouragement during follow-up + CPAP versus usual care + CPAP**	**Control**	**Relative (95% CI)**	**Absolute**		
CPAP Device Usage (hours/night) (Better indicated by lower values)												
14	randomised trials	serious[1]	serious[3]	no serious indirectness	serious[2]	None	766	735	-	MD 0.83 higher (0.45 to 1.22 higher)	⊕OOO VERY LOW	CRITICAL
Days PAP used >4 hours at 12 months (Better indicated by higher values)												
1	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	None	12	11	-	MD 11 lower (75.76 lower to 53.76 higher)	⊕⊕OO LOW	CRITICAL
Days PAP used >4 hours at 3 months (follow-up mean 3 months; Better indicated by higher values)												

2	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	None	149	145	-	MD 8.06 higher (1.80 to 14.33 higher)	⊕⊕⊕⊕ HIGH	CRITICAL
Mean adherence all days (min per day) at 12 months (Better indicated by higher values)												
1	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[2]	None	12	11	-	MD 45 higher (20.99 lower to 110.99 higher)	⊕⊕⊕O MODERATE	CRITICAL
CPAP use min/night (Better indicated by higher values)												
1	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	None	161	166	-	MD 20 higher (1.51 lower to 41.51 higher)	⊕⊕⊕⊕ HIGH	CRITICAL
N deemed adherent (≥ four hours/night)												
2	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	serious[2]	None	130/183 (71%)	63.5%	RR 1.19 (1.03 to 1.37)	121 more per 1000 (from 19 more to 235 more)	⊕OOO VERY LOW	CRITICAL
Withdrawals												
11	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	serious[2]	None	145/873 (16.6%)	11.8%	RR 1.22 (0.97 to 1.52)	26 more per 1000 (from 4 fewer to 61 more)	⊕OOO VERY LOW	IMPORTANT
Epworth Sleepiness Scale - Comparison Endpoint or Change from Baseline Values - ESS: Endpoint Scores (Better indicated by lower values)												

15	randomised trials	serious[1]	serious[3]	no serious indirectness	no serious imprecision	None	775	752	-	MD 0.28 lower (0.73 lower to 0.16 higher)	⊕⊕OO LOW	IMPORTANT
Quality of Life: Comparison of Values at Endpoint - QoL: FOSQ - Endpoint (Better indicated by higher values)												
3	randomised trials	serious[1]	no serious inconsistency	serious[4]	no serious imprecision	None	57	52	-	MD 0.55 higher (0.81 lower to 1.9 higher)	⊕⊕OO LOW	CRITICAL
Quality of Life: Comparison of Values at Endpoint - QoL: SAQLI - Endpoint (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	serious[4]	no serious imprecision	None	126	114	-	MD 0.5 higher (0.09 lower to 1.09 higher)	⊕⊕OO LOW	CRITICAL
Quality of Life: Comparison of Values at Endpoint - QoL: SF-36 (PH) - Endpoint (Better indicated by higher values)												
3	randomised trials	serious[1]	no serious inconsistency	serious[4]	serious[2]	None	160	174	-	MD 1.09 higher (0.34 lower to 2.52 higher)	⊕OOO VERY LOW	CRITICAL
Quality of Life: Comparison of Change from Baseline Values - QoL: FOSQ - Change from Baseline (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	serious[4]	serious[2]	None	22	17	-	MD 0.8 higher (1.25 lower to 2.85 higher)	⊕OOO VERY LOW	CRITICAL
Quality of Life: Comparison of Change from Baseline Values - QoL: SF-36 (PH) - Change from Baseline (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	serious[4]	very serious[2]	None	40	42	-	MD 0.3 higher (3.1 lower to 3.7 higher)	⊕OOO VERY LOW	CRITICAL

Quality of Life: Comparison of Change from Baseline Values - QoL: FOSQ-10 - Change from Baseline (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	Serious[4]	serious[2]	None	90	83	-	MD 3.3 higher (0.1 to 6.5 higher)	⊕OOO VERY LOW	CRITICAL
diastolic blood pressure (Better indicated by lower values)												
1	randomised trials	No	no serious inconsistency	no serious indirectness	serious[2]	None	26	29	-	MD 4.4 lower (9.82 lower to 1.02 higher)	⊕⊕⊕O MODERATE	IMPORTANT
systolic blood pressure (Better indicated by lower values)												
1	randomised trials	No	no serious inconsistency	no serious indirectness	serious[2]	None	26	29	-	MD 9.3 lower (17.57 to 1.03 lower)	⊕⊕⊕O MODERATE	IMPORTANT
AHI on treatment - Comparison of Values at Endpoint (Better indicated by lower values)												
5	randomised trials	serious[1]	very serious[3]	no serious indirectness	serious[2]	None	209	202	-	MD 0.80 higher (0.66 lower to 2.25 higher)	⊕OOO VERY LOW	IMPORTANT
Mortality												
Not reported												CRITICAL

[1] Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
[2] Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour ; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5;SAQLI – 2. GRADE default MID (0.5XSD)used for all other continuous outcomes.
[3] Downgraded by 1 or 2 increments for heterogeneity, unexplained by subgroup analysis. Random effect analysis used.

[4]Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively

Table 14: Clinical evidence profile: Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP - severe OSAHS

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Mixed (SUP/EDU/BEH) Intervention + CPAP versus Usual Care + CPAP	Control	Relative (95% CI)	Absolute		
CPAP Device Usage (hours/night) (Better indicated by higher values)												
10	randomised trials	serious[1]	very serious[2]	serious indirectness[4]	serious[3]	None	2264	2187	-	MD 0.82 higher (0.2 to 1.43 higher)	⊕OOO VERY LOW	CRITICAL
N deemed adherent (≥ four hours/night)												
9	randomised trials	serious[1]	Serious[2]	serious indirectness[4]	serious[3]	None	1807/2097 (86.2%)	65.6%	RR 1.14 (1.04 to 1.26)	92 more per 1000 (from 26 more to 171 more)	⊕OOO VERY LOW	CRITICAL
Withdrawal												
11	randomised trials	serious[1]	very serious[2]	serious indirectness[4]	very serious[3]	None	144/2511 (5.7%)	13.6%	RR 0.64 (0.32 to 1.28)	49 fewer per 1000 (from 92 fewer to 38 more)	⊕OOO VERY LOW	IMPORTANT
Quality of life: Comparison of Change from Baseline Values - QoL: FOSQ-10 - Change from Baseline (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	Serious[4]	serious[3]	None	93	83	-	MD 2.9 higher (0.52 lower to 6.32 higher)	⊕OOO VERY LOW	CRITICAL

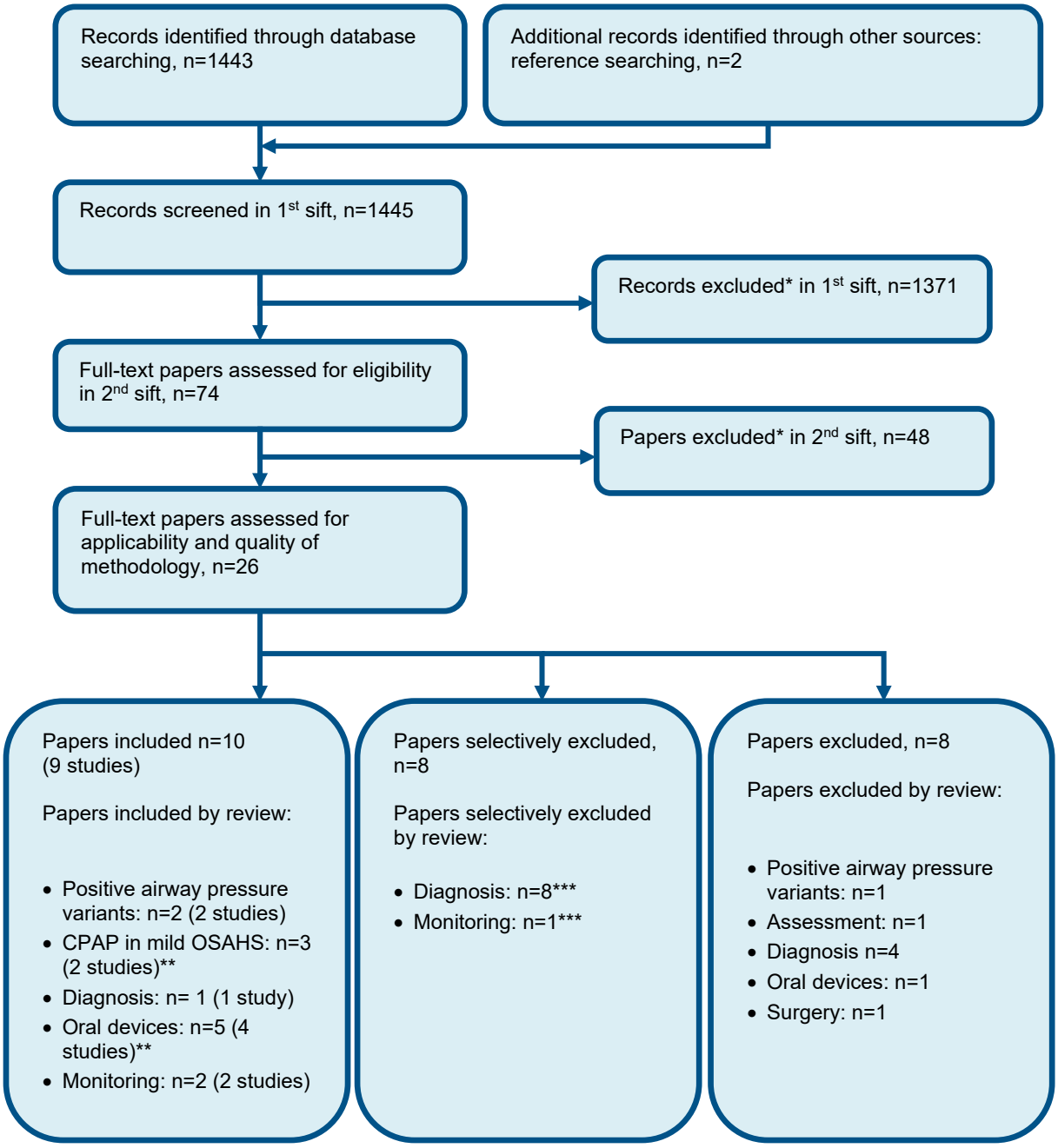
Quality of life: Comparison of Change from Baseline Values - QoL: SF-36 (PH) - Change from Baseline (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	Serious[4]	no serious imprecision	none	1497	1339	-	MD 5.7 higher (4.98 to 6.42 higher)	⊕⊕OO LOW	CRITICAL
Quality of Life: Comparison of Values at Endpoint - QoL: FOSQ - Endpoint (Better indicated by higher values)												
1	randomised trials	serious[1]	no serious inconsistency	Serious[4]	no serious imprecision	none	99	78	-	MD 0.3 higher (0.56 lower to 1.16 higher)	⊕⊕OO LOW	CRITICAL
Quality of Life: Comparison of Values at Endpoint - QoL: SF-36 (PH) - Endpoint (Better indicated by higher values)												
3	randomised trials	serious[1]	no serious inconsistency	Serious[4]	no serious imprecision	none	1611	1403	-	MD 4.85 higher (2.49 to 7.21 higher)	⊕⊕OO LOW	CRITICAL
Epworth Sleepiness Scale Score (Better indicated by lower values)												
8	randomised trials	serious[1]	no serious inconsistency	serious indirectness[4]	serious[3]	None	3401	2987	-	MD 1.32 lower (2.48 to 0.16 lower)	⊕OOO VERY LOW	IMPORTANT
Mortality												
Not reported												CRITICAL

[1] Downgraded by 1 increment if the majority of the evidence was at high risk of bias, and downgraded by 2 increments if the majority of the evidence was at very high risk of bias
[2] Downgraded by 1 or 2 increments for heterogeneity, unexplained by subgroup analysis. Random effect analysis used.
[3] Downgraded by one increment if the confidence interval crossed one MID and downgraded by two increments if the confidence interval crossed both MIDs. MID for machine usage (adherence)- 1 hour ; Established MIDs for SF-36 physical/mental- 2/3 ; FOSQ- 2 ; ESS -2.5; SAQLI – 2. GRADE default MID (0.5XSD) used for all other continuous outcomes.

4 Downgraded by 1 or 2 increments because the majority of the evidence included an indirect or very indirect population respectively

Appendix G: Health economic evidence selection

Figure 31: Flow chart of health economic study for the guideline



* Non-relevant population, intervention, comparison, design or setting; non-English language
** Two studies (in three papers) were included for two different questions
*** One study was considered for two different questions

Appendix H: Excluded studies

H.1 Excluded clinical studies

Table 15: Studies excluded from the clinical review for CPAP

Reference	Reason for exclusion
Aardoom 2020[1]	Meta-analysis- screened for relevant references.
Aloia 2013[2]	No Author Response; unable to determine if CPAP make or pressure delivery mode was consistent between groups.
Bague 2015[7]	No Author Response; unable to verify certain review inclusion criteria. No full publication available.
Bague-Cruz 2014[6]	No Author Response; unable to verify certain review inclusion criteria. No full publication available.
Cartwright 2017[14]	No Author Response; unable to verify certain review inclusion criteria. No full publication available.
Chen 2020[15]	Meta-analysis- screened for relevant references.
Cotton 2012[18]	No Author Response; unable to verify certain review inclusion criteria due to lack of valid contact information.
Dawson 2015[21]	No Author Response; unable to verify certain review inclusion criteria.
Deng 2013[25]	Inconsistent CPAP make across groups.
Epstein 2000[27]	No Published Report/Data Found.
Escourrou 2012[28]	No Author Response; unable to verify certain review inclusion criteria.
Guralnick 2017[33]	Inclusion criteria not met.
Harris 2014[35]	No Author Response; unable to verify certain review inclusion criteria due to lack of valid contact information.
Hwang 2018[39]	Study already included in the review
Isetta 2014[40]	Inclusion criteria not met.
Isetta 2015[41]	Inclusion criteria not met.
Kataria 2017[42]	No Author Response; unable to verify certain review inclusion criteria.
Lai 2014[45]	NCT represents duplicate of a published study.
Lopez-Martin 2005[48]	Wrong comparator. No Author Response; unable to verify certain review inclusion criteria.
Lugo 2019[49]	Study compares hospital routine (HR) with out-of-hospital Virtual Sleep Unit VSU. Study to be considered for inclusion in monitoring review.
Luyster 2018[50]	No Author Response; unable to verify certain review inclusion criteria.
Marques 2017[51]	No Author Response; unable to verify certain review inclusion criteria.
Marshall 2003[52]	No randomization, randomization not verifiable due to lack of valid author contact information.
Moore 2012[55]	No Author Response; unable to verify certain review inclusion criteria.
Nadeem 2013[59]	Inclusion criteria not met.
Ong 2020[63]	Inappropriate comparison- cognitive behavioural therapy versus positive airway pressure (PAP)
Rodgers 2015[70]	No Author Response; unable to verify certain review inclusion

Reference	Reason for exclusion
	criteria.
Schiefelbein 2005[75]	Inclusion criteria not met; review outcomes of interest not examined in study
Schoch 2019[76]	Full text paper not available
Singhal 2016[80]	No randomisation, randomisation not verifiable due to lack of valid author contact information.
Shapiro, 2019[78]	Study already included in the review
Sweetman 2019[88]	Participants not on CPAP during CBT intervention.
Suarez 2017[87]	No Published Report/Data Found
Tatousek 2015[89]	No Author Response; unable to verify certain review inclusion criteria.
Taylor 2006[90]	Inclusion criteria not met
Tolson 2016[91]	No Published Report/Data Found.
Wiese 2005[96]	No Author Response; unable to determine procedures for OSA diagnosis.

Table 16: Studies excluded from the clinical review for oral devices and positional modifiers

Reference	Reason for exclusion
Berger 2018[11]	Incorrect study design - conference abstract
Cunali 2011[19]	Incorrect stratum and Incorrect population - only included patients with TMD
De Vries 2017[23]	Incorrect study design - conference abstract
De Vries 2018[22]	Incorrect study design - conference abstract
Garbuio 2008[31]	Incorrect study design - conference abstract
Gauthier 2010[32]	Incorrect study design - conference abstract
Murphie 2016[58]	Incorrect study design - conference abstract
Pepin 2018[67]	Incorrect stratum and incorrect population - CPAP users
Quintela 2009[68]	Inappropriate comparison and incorrect study design - conference abstract
Sheets 2019[79]	Incorrect stratum and incorrect study design - conference abstract
Vanderveken 2011[93]	Incorrect stratum and incorrect study design - conference abstract
Vanderveken 2013[94]	Incorrect stratum and incorrect intervention - no behavioural/supportive/educational intervention included
Yoshioka 2017[97]	Incorrect stratum and incorrect study design- conference abstract

H.2 Excluded health economic studies

Published health economic studies that met the inclusion criteria (relevant population, comparators, economic study design, published 2003 or later and not from non-OECD country or USA) but that were excluded following appraisal of applicability and methodological quality are listed below:

None.

Appendix I: Research recommendations

I.1 Interventions to improve CPAP adherence

Research question: Which interventions including behavioural interventions are clinically and cost-effective to improve adherence of CPAP in people with OSAHS, OHS and COPD-OSAHS overlap syndrome who have difficulty using CPAP?

Why this is important

When CPAP is used to overcome upper airway obstruction in people with OSAHS, OHS or COPD-OSAHS overlap syndrome, regular nightly use is essential in order for it to be effective. For patients to adapt to using this physical therapy each time they sleep, they require education from trained sleep professionals, access to support in the early adaptation period and clinical review to optimise aspects such as machine pressure, mask fit and humidification.

For people who continue to find CPAP difficult to use despite this input, there have been no randomised controlled trials to determine an effective universal approach to improve ongoing CPAP use. Current research is limited to all people commencing CPAP and not just those who experience difficulties.

If people stop using CPAP, they are no longer having the optimal therapy for their airway obstruction and this has health and economic impacts.

Criteria for selecting high-priority research recommendations:

PICO question	Population: Adults with OSAHS (any severity), OHS or COPD-OSAHS overlap syndrome who have been initiated on CPAP therapy but having difficulty with use of CPAP regularly (such as less than 3 hours/night on 5 nights or more in preceding month) Intervention(s): Psychological and/or behavioural intervention Comparison: Usual care Outcome(s): CPAP adherence (hours/night), ESS, quality of life, cost
Importance to patients or the population	This research would establish whether those people who find CPAP difficult to use regularly who are given appropriate support can increase CPAP use and therefore improve their sleep and quality of life. Potentially the numbers of patients giving up CPAP in the short term would decrease, the numbers of people using CPAP long term would increase. The numbers of people seeking alternative treatments for OSAHS, OHS and COPD-OSAHS overlap syndrome instead of CPAP would decrease. Long term health benefits from CPAP would potentially increase.
Relevance to NICE guidance	Future NICE guidance can give specific recommendations regarding which interventions to use to optimise CPAP use and reduce existing uncertainty.
Relevance to the NHS	A clear recommendation for a behavioural or psychological intervention will offer clinicians clear guidance on best care for optimising CPAP adherence. This is likely to be provided by training existing sleep teams in best practice and will therefore not have impact in terms of more equipment being required or more staffing. Service delivery will be affected as it is likely a new intervention would take more time for existing staff.
National priorities	None
Current evidence base	The current evidence is reviewed in Evidence report N the full guideline. Current research is limited to all people with moderate and severe OSAHS commencing CPAP and not just those who experience difficulties and

	there is no research in people with OHS or COPD-OSAHS overlap syndrome commencing CPAP.
Equality	The recommendation is unlikely to impact on equality issues.
Study design	Randomised controlled trial with economic analysis. There should be randomisation with minimisation to allow separate subgroups of people with: OSAHS, OHS, COPD-OSAHS overlap syndrome to be allocated equally across the intervention and control arms and power calculations will determine size of these subgroups to allow comparisons.
Feasibility	The trial is feasible and should be straightforward to carry out. The control group will reflect usual clinical care which is currently given at sleep centres.
Other comments	The trial may attract commercial funding from companies who provide CPAP.
Importance	Medium: the research is relevant to the recommendations in the guideline, but the research recommendations are not key to future updates.