APPENDIX A. SEARCH STRATEGIES

Ovid (Medline) KQ1 and KQ2:

1. Sleep Apnea Syndromes/di,th [Diagnosis, Therapy]
2. Sleep Apnea, Obstructive/di,th [Diagnosis, Therapy]
3. (protocol: or algorithm:).mp.
4. Patient care team/ or nurse's practice patterns/ or health personnel/ or allied health personnel/
5. Sleep apnea syndromes/nu or sleep apnea, obstructive/nu
6. (nurse led or nurse-led).ti,ab.
7. (nurse: or nursing or technician:).mp.
8. Primary health care/ or physicians/ or (nurse* or technician or special* or primary care or physician).ti,ab.
9. "referral and consultation"/ or (electronic adj consult).mp. or consult*.mp. or telemedicine/ or remote consultation/
10. Mass screening/
11. Continuous positive airway pressure/mt, nu [methods, nursing]
12. Polysomnography/nu [nursing]
13. Chart review.mp. or risk assessment/
14. 1 or 2
15. 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
16. 14 and 15
17. Limit 16 to (English language and yr = "2000-Current")
18. Limit 17 to "all child (0 to 18 years)"
19. Limit 17 to "all adult (19 plus years)"
20. 18 not 19
21. 17 not 20

Ovid (Medline) KQ3:

1. Sleep Apnea Syndromes/th [therapy] or Sleep Apnea, Obstructive/th [therapy]
2. (titrat* and (manual or conventional or standard or fixed or (auto* or APAP))).mp.
3. Home care services/
4. (positive-pressure respiration/ or continuous positive airway pressure/ or intermittent positive-pressure ventilation/ or CPAP.mp.) and (calibration/ or (telemetric or titrat*).mp.)
5. 2 or 3 or 4
6. 1 and 5
7. Limit 6 to (English language and yr = "2000-Current")
8. Limit 7 to "all child (0 to 18 years)"
9. Limit 7 to "all adult (19 plus years)"
10. 8 not 9
11. 7 not 10

CINAHL KQ1 and KQ2:

1. (MH “Sleep Apnea Syndromes/DI/TH”)
2. (MH “Sleep Apnea, Obstructive/DI/TH”)
3. AB (protocol* or algorithm*)
4. (MH “Multidisciplinary Care Team”) OR “MH “Team Nursing”) OR (MH “Total Patient Care Nursing”)
5. (MH “Nursing Practice”) OR (MH “Scope of Nursing Practice”)
6. (MH “Health Personnel”) OR (MH “Allied Health Personnel”)
7. (MH “Sleep Apnea Syndromes/NU”) OR (MH “Sleep Apnea, Obstructive/NU”)
8. “nurse led”
9. “nurse-led”
10. AB (nurse* or nursing or technician*)
11. (MH “Primary Health Care”)
12. (MH “Physicians”)
13. (MH “Referral and Consultation”) OR (MH “Remote Consultation”)
14. (MH “Telemedicine”)
15. AB (electronic adj consult) OR AB consult*
16. (MH “Health Screening”)
17. (MH “Continuous Positive Airway Pressure/MT/NU”)
18. (MH “Polysomnography/NU”)
19. 1 or 2
20. S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18
21. 19 AND 20 (Limits: Published dates 2000 to present, English Language)

CINAHL KQ3:

1. (MH “Sleep Apnea Syndromes/TH”) OR (MH “Sleep Apnea, Obstructive/TH”)
2. (MH “Positive Pressure Ventilation”) OR (MH “Continuous Positive Airway Pressure”) OR (MH “Intermittent Positive Pressure Ventilation”)
3. (MH “Calibration”)
4. AB “telemetric or titra*
5. 3 OR 4
6. 2 AND 5
7. AB titra* AND AB ((manual or conventional or standard or fixed or (auto* or APAP)))
8. (MH “Home Health Care”)
9. 6 OR 7 OR 8
10. 1 AND 9 (Limits: Published dates 2000 to present, English Language)

APPENDIX B. PEER REVIEW COMMENTS/AUTHOR RESPONSES

REVIEWER COMMENT	RESPONSE
1. Are the objectives, scope, and methods for this review clearly described?	
Yes	Thank you
Yes	
Yes	
Yes	
Yes	
Yes	
No - See comments. Methods incomplete. Concepts appeared in Results and Conclusions that were omitted in the Introduction and Methods.	Thank you for the suggestions. We address the specific issues in the comments below.
2. Is there any indication of bias in our synthesis of the evidence?	
No	Thank you
No	
No	
No	
No	
No	
No	
3. Are there any published or unpublished studies that we may have overlooked?	
No	Thank you
Yes - Epidemiology should be updated. Consider ref Peppard Am J Epid 2013. Consider reference to cost associated with sleep apnea (Frost and Sullivan report just released, available on AASM website). The operational partner also has data on staffing, workload, and prosthetic costs related to sleep apnea, which may support the review (looking at alternative provider types to deliver sleep care, burden of disease within VA, etc.)	Thank you for the suggested references. We added the Peppard 2013 data to the Introduction. Although we typically only include data from peer review journals, we have included the Frost & Sullivan report for the AASM.
No	Thank you
No	
No	
No	
No	
4. Additional suggestions or comments can be provided below. If applicable, please indicate the page and line numbers from the draft report.	

I congratulate the sponsor and the ESP team on the conduct of a methodologically rigorous evidence synthesis report on a topic of great clinical importance. (1) The introduction (page 1) suggests that screening is most appropriate for symptomatic patients. I agree with this suggestion. This text, and the related text on page 10, however did not mention the American Heart Association/American Stroke Association (AHA/ASA) Stroke Prevention Guidelines which recommends screening all patients with stroke for OSA (regardless of symptoms) given the robust evidence that OSA is present in the overwhelming majority of stroke patients and the evidence that treatment with PAP improves outcomes. I believe that none of the articles that were the basis of those AHA/ASA guideline recommendations would be included in this ESP review because they did not meet inclusion criteria (e.g., to my knowledge, none compared CPAP to APAP). (2) I do not understand why dashed lines were used in the conceptual model figures from the Intermediate to the Clinical Outcomes boxes. Perhaps a legend might be added. (3) I like the use of italics to distinguish "titration" versus "treatment" in the last question. (4) In non-VA settings, many facilities use standard screening tools (e.g., Berlin) to identify patients for PSG-referral (without the intervening oversight of either a primary care provider or sleep specialist). This alternative model could be mentioned in the Background or Discussion related to question 1. (5) Given that the gaps in literature section may be useful to investigators writing IIR applications, I encourage the authors to be comprehensive in describing studies that would advance the field. For example, there are many alternative approaches to case finding (e.g., screening tools, direct use of APAP as a diagnostic test) and treatment (e.g., remote PAP monitoring, mandibular advancement devices and other approaches for PAP-intolerant patients) that merit investigation.	Thank you 1) Thank you. It is outside the scope of this review to evaluate guidelines and recommendations for screening (for example, after stroke). Our purpose in the introduction was to “set the stage” for our evaluation of alternative care models. 2) A legend (footnote) has been added. 3) Thank you. 4) We have now included this as part of our expanded explanation of ‘screen-detected’ patients and noted the limited data on screen-detected patients in the Applicability and Implementation section. 5) We have expanded the gaps/future research section.
Overall excellent job with the review!! Very comprehensive and highlights important evidence gaps. Under Research Gaps/Future Research: consider suggesting further evaluation on the implementation of the recommendations, not just CER of Key question 1. Key Question 2 has no published data/trials. A large pragmatic approach to studying this within the VA system is not only feasible but should be done since several programs have been using e-consults and never published outcomes. Any way to bridge this for focused HSRD would be helpful. Lastly, consider summarizing the burden of OSA, lack of providers, and clinical need for sleep medicine before wading into outcomes. This would be helpful for folks who skip to the summary directly.	Thank you. We have modified the Executive Summary to include the burden of OSA and to include the discussion of Key Question 2, as we agree with the reviewer statement.
The report is excellent! I thought the Executive Summary was too long.	Thank you. We shortened the Executive Summary.
(1) It is unfortunate that the studies by Berry, Kuna and Rosen were excluded from analysis and discussion (see page 51, line 3). These are three of the most important studies in the area of alternative care models for treatment of OSA, as the models of	1) Thank you for the suggestion. As the reviewer notes, these studies also ‘bundled’ HST vs. PSG with APAP vs. CPAP titration, and comparing HST vs.

care in practice are not restricted to home auto-CPAP versus laboratory-based CPAP titration. Efficiency of care is more strongly impacted by the use of home (HST) versus lab-based (PSG) testing. While this ESP report does not address the evidence supporting HST use as an alternative to PSG, HST use for diagnosis of OSA has become common clinical practice, especially within the VA, and these studies provide strong evidence that the HST-APAP approach achieves equivalent outcomes to the PSG-CPAP approach. This strengthens the current findings of key Question 3 regarding similarity of outcomes with APAP and CPAP. I strongly urge the authors to include a detailed analysis of these papers under Key Question 3. (2) Although it would significantly alter the scope of the report, an additional Key Question asking whether HST is a valid alternative to PSG for diagnosis of OSA would be welcome. Unfortunately, the USPSTF draft report was seriously flawed in this area, in particular failing to take into account the impact of night-to-night variation in OSA severity on PSG-HST comparisons. (3) Finally, the authors correctly observe that in the studies comparing sleep specialist to non-sleep specialist care, the non-specialists generally have had additional training or experience in management of sleep apnea patients. While this important point is clearly stated under Limitations in the Evidence Report (page 50, penultimate paragraph), it is absent from the Executive Summary. As most readers will probably not get beyond the Executive Summary, it is important to include there as well, and also in the Summary of Findings for Key Question #1 on page 22.	PSG was clearly not a goal of our study. However, the APAP vs. CPAP titration data generally suggested the same findings as we found in other studies, so we have expanded our discussion about these articles. Even though they did not strictly meet our inclusion criteria, . 2) We are not able to alter the scope at this time. HST vs PSG could be nominated for a future ESP report. 3) Thank you for the suggestion. We added this (and other) limitations to the Executive Summary.
Very clear layout of questions, only a few things that require clarification, major one is defining RDI- term has been used variably over time so this term needs to be defined for each study that used it, written in a very accessible way for the non-sleep specialist Page 6, line 36: Does this mean that care between the 2 groups was similar or that only the SSP group showed improvement (I think you mean the former but this is a little unclear). Page 7, line 6: RDI not defined prior to this; the definition of RDI has varied over time, for example prior to about the early 2000's RDI was equivalent to AHI, but at time subsequently RDI has included RERAs (Respiratory Effort Related Events). Recommend that this evolution in definition as it pertains to the studies that used the term, be stated somewhere in the document. Page 9, line 54: term "screen-detected pts" is used frequently, may be helpful at beginning of document to define this term- unclear to me if this means screened with validated measure such as a questionnaire or something else Page 28, line 45: The choice of this metric (≥ 4 hours of CPAP use on ≥ 70% of nights) for compliance is not based on any data. Wondering if this should be explicitly stated somewhere as we don't want to give the idea that this is # is sufficient for compliance.	Thank you for the suggestions. We made changes to clarify the text. Page 6. This sentence has been modified. Page 7, line 6: We added what this study reported for their RDI definition. Another study used RDI as part of a pre-test probability determination but did not define RDI. Page 9: We have clarified this term—thank you. Page 28. We comment in several places that measures of compliance varied. We extracted the compliance measures as reported in the included studies. We agree with the reviewer regarding the lack of evdidence for the ' > 4hrs for 70% of nights'

	metric, but given that many studies report this (and it is used for reimbursement—we did add this statement on page 27), we felt compelled to include it.
Page 37, line 10: "Technologist time was higher on titration morning" Does this mean that physician interpretation took less time for APAP than in-lab CPAP titration? This is true and is due largely to the larger amount of data available for the in-lab studies."	Page 37, line 10. This statement has been clarified.
Page 37, line 13: "Physician time for titration study reporting was lower in the home APAP group" This statement is also unclear. Does it mean that physician interpretation requires less time for APAP than CPAP? This is true largely due to increased information available for the in-lab studies.	Page 37, line 13. his statement has been clarified.
Table 6: Does # on front of arrow indicate the number of studies showing this result? Is this information only listed for cases where the data could not be pooled?	Table 6: Yes, the number is the number of studies. All reported outcomes are presented on the arrow tables.
• An abstract would be helpful.	-Thank you for the suggestion. An abstract has been added.
• Introduction, p. 12, lines 30-32: Provide references for estimates for OSA prevalence.	-We revised and added data from Peppard 2013.
• The distinction between intermediate and clinical outcomes is unclear. What is the difference between "weight (sic), BMI, libido, blood pressure, or HBA1c (sic)" (intermediate) and "libido, weight change, BMI, blood pressure, or HbA1c" (clinical)?	-We consider clinical outcomes to be patient-centered outcomes – something the patient can feel. Therefore, we attempt to distinguish between a change in a sleep scale score or weight (for example) and a clinically meaningful change in sleep score or weight.
• I find the limitation to English-speaking and European (do you mean Western European) countries problematic, regardless of an (unstated) interest in making applicable to the VA. Why not high income parts of Asia, Middle East, and Latin America? By North America, do you mean just US and Canada? Similarly, what is the justification for limiting to English language? Google Translate (and other methods) are highly effective.	-As described in the Limitations, our goal was to identify studies most applicable to clinical practice in the US and the VA. Regarding the non-English language studies, Google Translate has been evaluated and has not reached acceptable levels of accuracy. Standard methods for systematic reviews including through AHRQ and the ESP are to limit inclusion to articles published in English language.
• Implicitly, you have restricted to published, peer-reviewed articles. Is this the case?	-Yes. We searched MEDLINE and CINAHL.
• If ESS and SF-36 are all on the same scale (as they presumably are), why were standardized mean differences (and not weighted mean differences) used? SMD is clinically difficult to interpret. (The Cohen reference call out is missing the year). What were your minimum criteria for conducting a meta-analysis (how few studies would you meta-analyze)?	-There is no established minimal important difference for the ESS, so we used SMDs to facilitate interpretation of effect (how large was the effect based on the suggested cut points of 0.2 (small), 0.5 (moderate), and 0.8 (large)) and how precise was the

	estimate (if the upper or lower confidence limit crosses an effect size of 0.5 in either direction this would be considered imprecise). We will present the data as a WMD and an SMD. References have been converted to superscript format. For this review we focused our meta-analysis on ESS and SF-36 scores.
• I would suggest a much more detailed, explicit explanation for assessing the strength of evidence. Owens 2010 gives general guidance. What specifically was done here? Particularly, when and how did you determine the evidence was insufficient? Table 4 (for example) is opaque. It is unclear why strength of evidence is ranked as it is and what were the strengths and weakness of the evidence. Were directness, precision, sparseness, dose-effect, etc. assessed? Also, it would be more helpful to the reader to divide Table 4 into separate tables for each KQ.	-We added more detail in the Methods section. The strength of evidence was insufficient if no studies reported the outcome (*eg,* access to care) or if there was one small study with few events. Directness etc. were assessed and a table has been added (Appendix D). We divided Table 4 into separate tables for each KQ.
• Results summaries. It would be helpful to incorporate strength of evidence into the summaries. The summaries are written in a highly subjective manner, suggesting interpretation by the researchers not objective summary. Examples from KQ 1 include "good" [agreement], "similar", and "may be". • The abbreviation SSP is not used consistently. • Statements such as "At baseline the patients' average age was 55.2 years…" are unclear. This sounds like the description of a single study by appear to be a summary across the 8 studies. Where did 55.2 come from? Were the mean ages meta-analyzed? Is this the median?	-Strength of evidence has been added to the summary statements at the start of each KQ. Similar is a standard term as is "may be" when evidence is very low or even low. -The abbreviation is now used throughout. -The statements are intended to provide an overview of the population in the included studies. Table 1 indicates that the values are means (unless otherwise noted) and reports the number of studies included in determining the mean. The means are weighted means. This has been added to the tables.
• In what ways were high risk of bias (and medium risk of bias) studies likely to be biased? • While the tables succinctly summarize the results of the studies, they provide highly limited data. While the Appendix tables provide the details, they are too difficult to read. I would recommend a separate set of tables in the main text that provide the summary numerical results. Also the call out to "Appendix Tables 2-3" left out which appendix (C). And the formatting of the vertical portions of the tables needs fixing.	-Details on risk of bias are presented in Appendix C, Tables 1 and 7 (Study Characteristics) -Thank you for the suggestion. There were a variety of measures used for the different outcomes (*eg,* different components of the SF-36) and then different reporting of the results (*ie,* mean differences, effect sizes). We thought the "arrow" tables and the Strength of Evidence tables were the best way to convery results in the text. The reference to Appendix C and the vertical alignment have been corrected.
• Figure 3 has "Mental Health" in the wrong place. It should be below the headers. Overall, the figure is unclear. It is not at all clear that the sub-analyses are in fact sub-analyses. Without close inspection, there appear to be 5 studies each for mental health and vitality (3 nurse and 2 PCP). A sub-analysis of a single study (PCP) is uninformative and misleading. The text part of the figure gives no clear distinction between the studies,	-The Figures have been revised for clarity deleting 'sub-analysis" lines and additional information in the legend. WMDs are presented.

sub-analyses, and overall analyses. What are the sample sizes, baseline values, follow-up times of the individual studies? Again, why is this done as a SMD and not a WMD? The figure needs a proper legend. Std diff and CI are not defined.	
• Page 27, lines 19 and following. It is not clear why adverse events are summarized if the RCT did not provide separate data for the two treatment groups. There is no evidence to address the KQ. Also, the term treatment group is unclear for KQ 1 which compares providers not treatments.	-We agree and have modified the statements about adverse events for KQ1 throughout the report. We also changed the “treatment group” wording.
• Tables 2 and 3, with thought, partly distinguish the difference between clinical and intermediate outcomes better than the methods but the distinction seems to be more categorical vs. continuous rather than clinical vs. intermediate. Table 3 should probably better clarify that weight and BP etc. are continuous outcomes.	-As noted above, we considered weight and symptom scores as intermediate outcomes but attainment of a minimally important difference in one of those outcomes as a clinical or patient-centered outcome. We attempted to clarify in the summary statements.
• Limitations: Consider whether you are able to make any determination about possibility of bias due to the agendas of the authors. It seems plausible that studies of non-specialists vs. specialists (or home vs. lab titration which could greatly affect lab income) are being conducted by researchers with an agenda (eg, to promote non-specialists).	-We could not determine bias, but these are by nature unblinded studies. However, the reviewer raises an important issue and we now suggest (in the Executive Summary and full report) that future studies have outcomes collected in a blinded fashion where feasible.
• Research Gaps/Future Research: Consider also talking about within-study gaps, particularly related to possible reporting bias. KQ 1 and 2 are explicitly discussed in this section; why isn't KQ 3?	- We have added some gaps/future research regarding KQ3 in this section (but only in the full report, rather than the Executive Summary—we felt that the gaps in KQ1 and KQ2 were more important for the Executive Summary). Thank you.
• Conclusions: I believe the conclusions section is the first mention of a decreasing supply of sleep physicians.	Thank you for noting this—we now discuss the decreasing supply in the introduction.

APPENDIX C. EVIDENCE TABLES

Table 1. Study Characteristics for KQ1

Author, year Study Design Location Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/Exclusion Criteria	Patient Characteristics (expressed in mean (sd) unless otherwise noted)	Risk of Bias
Chai-Coetzer 2013[31] RCT Australia Participants screened in primary care	Primary care management (n = 81) Usual care, sleep specialist (n = 74) 6 months	Case finding (diagnosis) and Management Primary care management included physicians and community-based nurses who participated in an education program on obstructive sleep apnea and its management. Patient treated with CPAP, conservative therapy, mandibular advancement splint. One of the 4 nurses had 15 years of experience in a tertiary sleep center.	Inclusion: aged 25-70, high diagnostic likelihood of moderate to severe OSA, defined as a score of ≥ 5 out of 10 points on a 4-item questionnaire and an overnight 3% oxygen desaturation index (≥ 3%ODI) of ≥ 16 events per hour and an ESS score of ≥ 8 or persistent hypertension despite taking ≥ 2 antihypertensive agents Exclusion: severe morbid obesity (BMI > 50), neuromuscular disease, unstable psychiatric disease or cognitive impairment considered likely to interfere, hospitalization in the previous 3 months for MI, unstable angina, cardiac failure, or CVA or New York Heart Association class III or IV symptoms, or lung disease with awake resting oxygen saturation of <92%	N = 155 Primary Care: n = 81 Mean age: 57.2 (10.9) Male gender, %: 85 BMI: 33.1 (5.5) Oximetry ≥ 3% ODI, events/h: 32.7 (18.2) BP, systolic mmHg: 134 BP, diastolic mmHg: 84.5 ESS: 12.8 (3.9) OSA 50 questionnaire score: 8.2 (1.5) Specialist: n = 74 Mean age: 54.5 (11.8) Male gender, %: 77 BMI: 33.7 (5.6) Oximetry: 35.7 events/h (17.4) BP, systolic mmHg: 135.9 BP, diastolic mmHg: 85.23 ESS: 12.5 (3.9) OSA 50 questionnaire score: 8.1 (1.7)	**Sequence generation:** adequate **Allocation concealment:** adequate **Blinding:** NR **Incomplete outcome data:** reasons for dropout reported, ITT analyses (all randomized) but uneven dropouts by arm (21% and 8%) and > 10% dropped out **Selective outcome reporting:** no **Risk of Bias: Medium**

Author, year Study Design Location Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/Exclusion Criteria	Patient Characteristics (expressed in mean (sd) unless otherwise noted)	Risk of Bias
Chamorro 2013[32] Retrospective record review Spain Sleep unit	Primary care pulmonologist vs sleep specialist (n = 96) unclear	Diagnosis Examine concordance between test prescribed by primary care pulmonologist and ideal test recommended by sleep specialist	Inclusion: patients with suspicion of OSAH referred to sleep unit by primary care pulmonologist in 2010	n = 96 Mean age: 58.7 (12.6) Male gender, %: 71 BMI: 30.26 (5.39) ESS: 11.57 (4.7) HTN: 38% Diabetes: 14%	**Selection bias:** inadequate **Blinding of outcome assessment:** inadequate **Intention-to-treat analysis:** adequate **Attrition bias:** adequate **Selective outcome reporting:** adequate **Risk of Bias: High**
Andreu 2012[29] RCT Spain Pulmonology section of the University Hospital	**Group A:** Home respiratory polygraphy and home follow-up by sleep unit nurse (n = 22) **Group B:** Supervised polysomnography and hospital follow-up with sleep unit pulmonologist (n = 22) **Group C:** Home respiratory polygraphy and hospital follow-up with sleep unit pulmonologist (n = 21) 6 months	Treatment All received CPAP	Inclusion: high level of clinical suspicion of OSAS based on an Epworth Sleepiness Scale (ESS) score ≥ 12 and a Sleep Apnoea clinical score (SACS) ≥ 15 Exclusion: impaired lung function (COPD, obesity-hypoventilation, and restrictive disorders), associated pathologies (psychiatric disorders, neoplasms, restless leg syndrome, and other dyssomnias or parasomnias), or previously treated with CPAP	n = 65 Mean age: 52 Male gender, %: 83 BMI: 34 Hypertension: 49% Habitual snoring: 100% SACS: 40 (26) AHI(/hr): 43 (20) ODI(/hr): 44 (26) Neck circumference (cm): 45.5 (3.5)	**Sequence generation**: adequate **Allocation concealment:** adequate **Blinding:** no **Incomplete outcome data:** 58/65 (89%) completed program; intent-to-treat analysis included all but 1 patient (refused PSG) **Selective outcome reporting**: some outcomes not reported by group but overall adequate **Risk of Bias: Medium**

Author, year Study Design Location Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/Exclusion Criteria	Patient Characteristics (expressed in mean (sd) unless otherwise noted)	Risk of Bias
Pamidi 2012[35] Retrospective chart review Chicago University sleep disorders center	Sleep Specialists, initial PSG ordered by a sleep specialist (n = 105) Non-sleep Specialist, Initial PSG ordered by a non-sleep specialist (60% primary care physicians, 8% otolaryngologists, 7% pulmonologists, 6% neurologists, 6% endocrinologists, 5% cardiologists, 3% surgeons, and 4% other) (n = 298) 30 days	Case finding Referred patients received in-lab PSG and CPAP titration done by sleep laboratory personnel, had CPAP set up in homes by a durable medical equipment provider	Inclusion: evaluated medical records of adults who were CPAP naïve and were referred for their first in-laboratory PSG for suspicions of OSA Exclusion: previous CPAP use, requirement for bi-level PAP or adaptive servoventilation, central sleep apnea, and lack of adherence data due to a lack of or faulty wireless modem transmission device	n = 403 Mean age:52.5 (14) Male gender, %: 47 Race, African American: 54% Non-African American: 46% (significantly fewer African Americans in sleep specialist group) BMI: 36.3 (9.1) Hypertension: 58.5% (significantly more hypertensives in sleep specialist group) T2DM: 26% ESS: 9.2 (5.2) CES-D scale: 16 (11) Total sleep time, min: 324, P = .98 Arousal index, events/h: 29, P = .54 AHI(/hr): 36 ODI(/hr): 23 (significantly higher in non-sleep specialist group) SpO2: 80.6 (9.8)	**Selection bias:** adequate **Blinding of outcome assessment:** N/A (objective – wireless transmission of data) **Intention-to-treat analysis:** adequate **Attrition bias:** inadequate **Selective outcome reporting:** adequate **Risk of Bias: Medium**

Author, year Study Design Location Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/Exclusion Criteria	Patient Characteristics (expressed in mean (sd) unless otherwise noted)	Risk of Bias
Lettieri 2011[33] Observational cohort study United States Community-based Hospital and Academic Sleep Center	**Group1 (n = 70):** primarily managed by primary care physician **Group2 (n = 70):** managed by sleep specialist **Group3 (n = 70):** managed by sleep specialist 4-6 week follow-up	Titration All treated with CPAP, titration via home APAP, or in-lab CPAP	Inclusion: diagnosed with OSA by HST or PSG (met criteria for OSAS according to AASM guidelines), eligible for home sleep study program (2 or more high-risk features such as habitual snoring, daytime fatigue, nonrestorative sleep, weight gain, and witnessed apneas; no suspicion of concomitant sleep disorders and no significant underlying comorbidities), diagnosed OSAS defined as AHI > 5 with compatible symptoms Exclusion: not eligible for HST (cardiopulmonary disease, heart failure, CAD, previous cerebrovascular accident, poorly controlled asthma, moderate to severe COPD [FeV1 < 50%], supplemental oxygen requirement)	n = 210 Group 1: Mean age: 50.4 (9.2) Male gender, %: 64.3% BMI: 32.2 (4.8) Baseline ESS: 14.8 (54.8) Baseline fatigue: 6.3 (1.5) AHI(/hr): 20.7 (12.2) Group 2: Mean age: 47.1 (8) Male gender, %: 71.4 BMI: 30 (3.5) Baseline ESS: 14.1 (4.2) Baseline fatigue: 6.7 (1.7) AHI(/hr): 23.1 (13) Group 3: Mean age: 45.5 (5.4) Male gender, %: 68.6% BMI: 28.5 (3) Baseline ESS: 13.9 (4.4) Baseline fatigue: 6.5 (1.4) AHI(/hr): 19.3 (9.4)	**Selection bias:** inadequate; unclear how patients in Groups 2 and 3 were selected to achieve same number as in Group 1; participants in <u>all</u> groups had to meet the same criteria for HST and APAP **Blinding of outcome assessment:** NR (adherence was objective measure) **Intention-to-treat analysis:** adequate after exclusions for Group 1 and selection of equal number for Groups 2 and 3 **Attrition bias:** adequate **Selective outcome reporting:** adequate **Risk of Bias: Medium**

Author, year Study Design Location Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/Exclusion Criteria	Patient Characteristics (expressed in mean (sd) unless otherwise noted)	Risk of Bias
Antic 2009[30] RCT Australia Academic sleep medicine services, after referral for clinical suspicion of OSA	Specialist nurse (n = 100 randomized, 90 analyzed) Sleep physician (n = 95 randomized, 84 analyzed) 3 months	Management Specialist nurse was experienced in sleep disorders, supervising home auto-adjusting positive airway pressure to set therapeutic continuous positive airway pressure (CPAP). Sleep physician group had clinical care supervised by a sleep physician for in-lab CPAP titration and treatment	Inclusion: referred with a clinical suspicion of OSA, ESS score of ≥ 8, history of snoring ''most nights'' or ''every night,'' age 18-75 years, and patient willing to try CPAP Exclusion: unstable cardiovascular diseases (*eg,* recent unstable angina, myocardial infarction, stroke or TIA within the previous 6 months, or severe left ventricular failure), neuromuscular disease affecting or potentially affecting respiratory muscles, moderate to severe respiratory disease or hypoxemia or awake SaO_2<92%, or psychiatric disease that limited the ability to give informed consent or complete the study	n = 195 Nurse-led: n = 100 Mean age: 49.9 (SEM 1.2) Male gender, %: 72 BMI: 35.1 (SEM.7) ≥ 2% oxygen saturation dips, events/h: 49.2 (SEM 2.1) ESS: 13.7 (SEM 0.4) Specialist-led: n = 95 Mean age: 50.3 (SEM 1.3) Male gender, %: 76 BMI: 34 (SEM.6) AHI: 67.9 events/h (SEM 2.82) > / = 2% oxygen saturation dips, events/h: 52.5 (SEM 2.7) ESS: 13.4 (SEM 0.4)	**Sequence generation:** adequate **Allocation concealment**: adequate (explained in online supplement) **Blinding:** open-label but questionnaires and measurements administered by research assistants with no involvement in clinical care of patients and were blinded to patient allocation **Incomplete outcome data**: reasons for dropout reported, # randomized were not included in the analyses **Selective outcome reporting:** No **Risk of bias: Low**
Palmer 2004[34] RCT Scotland Hospital/peripheral clinics	Specialist nurse (n = 87 randomized, 79 at baseline, 68 at follow-up) Hospital-based consultant (n = 87 randomized, 77 at baseline, 71 at follow-up) 3 months	OSA management/ treatment Home visit by specialist nurse or hospital-based consultant review at general respiratory clinic for routine annual review for CPAP users	Inclusion: All patients in Highland who had a diagnosis of SAHS and a CPAP machine on 10/01/2000 Exclusion: Not described(none)	n = 174 randomized, 156 at baseline, 139 at follow-up Nurse: n = 79 at baseline Age: 54 (10) Male gender, %: 84 ESS: 8 (5) Consultant Clinic: n = 77 at baseline Age: 55 (11) Male gender, %: 87 ESS: 9 (6)	**Sequence Generation**: NR **Allocation concealment:** NR **Blinding:** NR **Incomplete outcome data:** unclear, 80% of target population finished both baseline and follow-up questionnaire, some reasons given, not uneven **Selective Reporting:** adequate **Risk of Bias: Medium**

Author, year Study Design Location Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/Exclusion Criteria	Patient Characteristics (expressed in mean (sd) unless otherwise noted)	Risk of Bias
Scharf 2004[36] Retrospective telephone survey and laboratory chart review USA University Specialty Hospital and a laboratory serving the medical community at large	Primary care practitioners (n = 44) Usual care, sleep specialists (n = 59) The mean time from diagnostic PSG to interview for primary care group was 7.0 months and 7.2 months for usual care	Management In primary care group all patients referred by primary care practitioners for usual care patients were seen by sleep specialists. All treated with CPAP	Inclusion: over 18 years old diagnosed with OSA Exclusion: NR	n = 103 Mean age: 49.4 (12.7) Male gender, %: 58.2 BMI: 36.1 (13.4) Diabetes: 19% HTN: 53% Unexplained daytime sleepiness/fatigue: 68% Snoring: 83%	**Selection bias:** adequate groups; unclear regarding possible confounders **Blinding of outcome assessment:** NR **Intention-to-treat analysis:** adequate **Attrition bias:** 37% survey response rate but comparable for 2 sites and non-responders were similar age, gender, RDI **Selective outcome reporting:** adequate **Risk of Bias: Medium**

AHI = apnea/hypopnea index; CES-D = Center of Epidemiology study depression scale; COPD = chronic obstructive pulmonary disorder; ESS = Epworth Sleepiness Scale; ODI = oxygen desaturation index; OSAS = obstructive sleep apnea syndrome; SpO2 = oxygen saturation measured by pulse oximetry; T2DM = type 2 diabetes mellitus

Table 2. Clinical Outcomes for KQ1

Study Intervention (n) Control (n)	All-cause Mortality % (n/N)		Resource Utilization (hospitalization, etc)		Access to Care[a]		MID, Sleep Symptom Scores		MID, Urinary Symptom Scores	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Chai-Coetzer 2013[31] Primary care (n = 81) Usual care (n = 74)	NR	NR	Baseline initiated CPAP: 90% (n = 73) conserva-tive measures: 2% (n = 2) 6 months using CPAP: 63% (n = 51) conserva-tive measures: 9% (n = 7)	Baseline: initiated on CPAP: 70% (n = 52) conserva-tive measures: 24% (n = 18) 6 months using CPAP: 61% (n = 45) conserva-tive measures: 16% (n = 12) RR of using CPAP at 6 m: 1.11 (0.95, 1.31)	NR	NR	NR	NR	NR	NR
Andreu 2012[29] Nurse (n = 22) Sleep pulmonologist (n = 43)	NR	NR	Extra visits 9 Extra calls 24	Extra visits **Group B**: 0 **Group C:** 5 Extra calls **Group B:** 17 **Group C**: 13	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	All-cause Mortality % (n/N)		Resource Utilization (hospitalization, etc)		Access to Care[a]		MID, Sleep Symptom Scores		MID, Urinary Symptom Scores	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Antic 2009[30] Nurse (n = 100) Usual care (n = 95)	NR	NR	Number of physician visits per patient 0.2 (SEM 0.1) Effect size: 2.24 (1.88, 2.6) Scheduled nursing time per patient 153 min (SEM 3.9) P<.001 Un-scheduled nursing time per patient 8.4 min (SEM 1.5) Effect size: -0.15 (-0.43, 0.13)	Number of physician visits per patient 2.4 (SEM 0.1) P<.001[a] Scheduled nursing time per patient 103 min (SEM 4.2) Effect size: 1.25 (0.94, 1.56) Un-scheduled nursing time per patient 11.4 min (SEM 2.5) P = .31[a]	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	All-cause Mortality % (n/N)		Resource Utilization (hospitalization, etc)		Access to Care[a]		MID, Sleep Symptom Scores		MID, Urinary Symptom Scores	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Palmer 2004[34] Nurse (n = 68) Consultant Clinic (n = 71)	NR	NR	61% of patients seen by the consultant required onward referral to specialist nurse for practical help Average time spent with nurse: 26 (6) minutes Average time spent with consultant: 10 (6) minutes Effect size: 0.32 (-0.01, 0.66)		NR	NR	NR	NR	NR	NR
Scharf 2004[36] Primary care (n = 44) Usual care (n = 59)	NR	NR	Patients offered CPAP 79% (35/44) RR: 0.92 (0.77, 1.1) P = .367 Accepted treatment with CPAP 83% (29/35) P = NS[a]	Patients offered CPAP 86% (51/59) P = NS[a] Accepted treatment with CPAP 86% (44/51) RR: 0.96 (0.8, 1.16)	NR	NR	NR	NR	NR	NR

[a]between groups

SEM = standard error of the mean; RR = risk ratio; NS = not statistically significant; NR = not reported

Table 3. Clinical Outcomes for KQ1, Continued

Study Intervention (n) Control (n)	Quality of Life		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Chai-Coetzer 2013[31] Primary care (n = 81) Usual care (n = 74)	SF-36 Vitality Baseline 43.6 Change at 6 m 16.1 (11.0, 21.2) Adjusted difference: 2.51 (-3.88, 8.9) P<.001 from baseline SF-36 Mental Baseline 66.5 Change at 6 m 7.9 (4.0, 11.8) P<.001 from baseline P = .54[a]	SF-36 Vitality Baseline 34.6 Change at 6 m 19.9 (14.4, 25.4) P<.001 from baseline P = .44[a] SF-36 Mental Baseline 61.6 Change at 6 m 8.4 (4.5, 12.3) P<.001 from baseline Adjusted difference: 1.57 (-3.41, 6.55)	VSQ-9 Small but statistically significant differences in 5/9 items in favor of the primary care group No difference in overall satisfaction Effect sizes for the 9 items were small (range, 0.14-0.41) and may not be clinically significant		NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Quality of Life		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Antic 2009[30] Nurse (n = 100) Usual care (n = 95)	SF-36 Vitality change at 3 m -16.12 (SEM 2.17); n = 89 Effect size: -0.04 (-0.34, 0.26) SF-36 Mental change at 3 m -4.81 (SEM 1.46); n = 89 Effect size: 0.017 (-0.28, 0.32) No significant differences between groups in any of the quality of life indices	SF-36 Vitality change at 3 m -15.31 (SEM 2.06); n = 81 Mean difference: -0.81 (-6.75, 5.12) SF-36 Mental change at 3 m -5.09 (SEM 2.11); n = 81 Mean difference: 0.27 (-4.71, 5.27)	VSQ-9 Total patient satisfaction with treatment was not statistically significantly different between the 2 groups Mean scores, Nurse 3.73 (SD 0.47); n = 89 vs UC 3.76 (SD 0.43); n = 79, P = .68[a] Effect size: -0.06 (-0.37, 0.24)		NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Quality of Life		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Palmer 2004[34] Nurse (n = 68) Consultant Clinic (n = 71)	SF-36 PCS Baseline 39 (16) P = .10 3 months 39 (17) Change -1 (8) Effect size: 0.24 (-0.1, 0.57) MCS Baseline: 51 (11) P = .51 3 months 52 (13) Change 1 (7) No significant difference in any parameter between groups or from baseline for nurse Also reported SF-36 vitality and mental health scores	SF-36 PCS Baseline 34 (17) 3 months 35 (17) Change 2 (9) P = .16 MCS Baseline 49 (14) 3 months 51 (11) Change 2 (10) P = .64 Effect size: 0.08 (-0.25, 0.42) General health and social functioning both significantly improved from baseline P<.025 for consultant group	There were some "preference" data reported that were different (P = .00) by study arm		NR	NR	NR	NR	HADS Anxiety Baseline 6.1 (4.8) P = .5[a] 3 m 5.4 (5) Effect size: 0 (-0.33, 0.33) Change -0.6 (3.1) Depression Baseline 4.4 (4.3) 3 m 4.3 (4.4) Change 0.2 (2.9)	HADS Anxiety Baseline 6.7 (5.2) 3 m 5.4 (4.2) Change -1.1 (4.2) P = .54[a] Depression Baseline 5.5 (4.8) P = .18[a] 3 m 4.7 (4.4) Effect size: -0.09 (-0.42, 0.24) Change -0.6 (3.1) P = .27[a]

Study Intervention (n) Control (n)	Quality of Life		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Scharf 2004[36] Primary care (n = 44) Usual care (n = 59)	NR	NR	NR	NR	NR	NR	NR	NR	Subjective symptoms improve-ment (from diagnostic PSG to interview mean 7 m) 80% (28/35) RR: 1.09 (0.86, 1.4)	Subjective symptoms improve-ment (from diagnostic PSG to interview mean 7.2 m) 74% (36/49) P = NS[a]

[a]between groups

HADS = Hospital Anxiety and Depression Scale; NS = not statistically significant; NR = not reported; MCS = mental component summary (SF-36); PCS = physical component summary (SF-36); PSG = polysomnography; SEM = standard error of the mean; UC = usual care; VSQ-9 = Visit- Specific Satisfaction Questionnaire

Table 4. Intermediate Outcomes for KQ1

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Chai-Coetzer 2013[31] Primary care (n = 81) Usual care (n = 74)	NR	NR	NR	NR	ESS Baseline 12.8 6 months: 7.0 Change: 5.8 (4.4, 7.2) P<.001 from baseline Adjusted difference in mean change: -0.13 (lower bound -1.5) (for non- inferiority test)	ESS Baseline 12.5 6 months: 7.0 Change: 5.4 (4.2, 6.6) P<.001 from baseline P = .43[a]	FOSQ Baseline 14.7 Change at 6 m 2.8 (2.0, 3.6) P<.001 from baseline Adjusted difference: 0.18 (-0.58, 0.94) SASQ Baseline 71.2 Change at 6 m -29.7 (-23.0, -36.4) P<.001	FOSQ Baseline 14.2 Change at 6 m 2.8 (2.2, 3.4) P<.001 from baseline P = .64[a] SASQ Baseline 72.1 Change at 6 m -31.2 (-23.8, -38.6) P<.001 P = .85[a] Adjusted difference: 0.18 (-0.58, 0.94)	Baseline: 101.9kg Change at 6 m -0.1 (-2.5, 2.3) Adjusted difference: - 0.43 (-3.43, 2.57)	Baseline: 103.2 Change at 6 m 0.3 (-1.5, 2.1) P = .78[a]

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Andreu 2012[29] Nurse (n = 22) Sleep pulmonologist (n = 43)	NR	NR	NR	NR	ESS Baseline 15 (3) 6 months 6 (5) P<.001 from baseline P = NS[a] Effect size vs B: 0 (-0.59, 0.59) Effect size vs C: 0.22 (-0.38, 0.82)	ESS Baseline **B:** 16 (4) **C:** 16 (3) 6 months **B:** 6 (4) **C:** 5 (4) P<.001 from baseline for both groups	FOSQ Baseline 16 (3) 6 months 18 (2) P<.001 from baseline P = NS Effect size vs B: 0 (-0.6, 0.6) Effect size vs C: -0.63 (-1.24, -0.02)	FOSQ Baseline **B**: 16 (3) **C:** 16 (3) 6 months **B:** 18 (2) **C:** 19 (1) P<.001 from baseline	NR	NR
Pamidi 2012[35] Sleep specialist (n = 105) Non-sleep specialist (n = 298)	Events/hr Baseline 38 Residual 3.7 (median) P<.001[a]	Events/hr Baseline 31 P = .06[a] Residual 4.9	NR	NR	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Lettieri 2011[33] Group 1: Primary care (n = 70) Group 2: Sleep specialist (n = 70) Group 3: Sleep specialist (n = 70)	NR	NR	NR	NR	ESS **Group 1** Baseline 14.8 (4.8) P = .48[a] Follow-up 9.1 (3.6) P = .39[a] Effect size vs 2: 0.23 (-0.1, 0.56) Effect size vs 3: 0.07 (-0.26, 0.4) Change 38.5% P = .28[a]	ESS **G2:** Baseline 14.1 (4.2) Follow-up 8.4 (2.3) Change 39.8% **G3:** Baseline 13.9 (4.4) Follow-up 8.9 (2.1) Change 36%	NR	NR	NR	NR
Antic 2009[30] Nurse (n = 100) Usual care (n = 95)	NR	NR	NR	NR	ESS Baseline 13.7 Change at 3 m 4.02 (SEM 0.52); n = 90 MD = -0.13 (-1.52, 1.25) P = NS[a]	ESS Baseline 13.4 Change at 3 m 4.15 (SEM 0.47); n = 84	FOSQ Change at 3 m -13.6 (SEM 2.02); n = 89 MD = -0.38 (-5.97, 5.20) P = NS[a] Maintenance of wakefulness test, min Change at 3 m 30.18 (SEM 1.24)	FOSQ Change at 3 m -13.22 (SEM 1.96); n = 81 Maintenance of wakefulness test, min Change at 3 m 31.68 (SEM 1.08) MD -1.49 (-4.76, 1.78) P = NS[a]	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Palmer 2004[34] Nurse (n = 68) Consultant Clinic (n = 71)	NR	NR	NR	NR	ESS: Baseline 8 (5) P = .24[a] 3 months 8 (6) Effect size: 0 (-0.33, 0.33) Change 0.2 (4) Symptom Score Baseline P = .14[a] 3 months 11 (9) Effect size: -0.3 (-0.63, 0.04) Change -2 (7) P<.025 from baseline	ESS: Baseline 9 (6) 3 months 8 (6) Change -0.9 (4) P = .30 Symptom Score Baseline 17 (12) 3 months 14 (11) Change -3 (9) P<.025 from baseline P = .94[a]	NR	NR	NR	NR

[a]between groups

ESS = Epworth Sleepiness Scale (non-inferiority margin was -2.0); FOSQ = Functional Outcomes of Sleep Questionnaire; MD = mean difference; NS = not statistically significant; NR = not reported; RR = risk ratio; SASQ = Sleep Apnea Symptoms Questionnaire; SEM = standard error of the mean

Table 5. Intermediate Outcomes for KQ1, Continued

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Compliance/Adherence	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Chai-Coetzer 2013[31] Primary care (n = 81) Usual care (n = 74)	NR	NR	Systolic Baseline: 134 mmHg Change at 6 m -2.2 (-6.3, 1.9) Adjusted difference: 1.52 (-4.14, 7.18) Diastolic Baseline: 84.5 mmHg Change at 6 m -1.4 (-4.3, 1.5) P = .48[a]	Systolic Baseline: 136 mmHg Change at 6 m -4.4 (-9.1, 0.3) P = .60[a] Diastolic Baseline: 85 mmHg Change at 6 m -0.5 (-3.6, 2.6) Adjusted difference: -1.32 (-4.97, 2.33)	NR	NR	NR	NR	Hours/night 4.8 (2.1) (n = 51) Effect size: -0.39 (-0.79, 0.02)	Hours/night 5.4 (0.30) (n = 44) P = .11[a]

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Compliance/Adherence	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Andreu 2012[29] Nurse (n = 22) Sleep pulmonologist (n = 43)	NR	NR	NR	NR	NR	NR	NR	NR	6 months Compliant (≥ 4 hours/ night on 70% of nights): 16/22 (73%) P = NS RR vs C: 1.27 (0.81, 2.0) Minutes used: 271 (130) Effect size vs B: -0.16 (-0.43, 0.76)	6 months Compliant **B:** 15/21 (68%) **C:** 12/21 (57%) RR vs B: 1.02 (0.7, 1.48) Minutes used: **B:** 252 (100) **C:** 263 (112) P = NS[a] Effect size vs C: 0.07 (-0.53, 0.66)

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Compliance/Adherence	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Pamidi 2012[35] Sleep specialist (n = 105) Non-sleep specialist (n = 298)	NR	NR	NR	NR	NR	NR	NR	A	Mean CPAP usage, min: 219 (152) Effect size: -0.35 (-0.57, -0.12) % days ≥ 4h CPAP usage: 46% CPAP use ≥ 4hours/ night on ≥ 70% of nights: 98/298 (32.9%) RR: 0.72 (0.55, 0.94)	CPAP usage: 279 (179) P = .005[a] % days ≥ 4h CPAP: 63% P = .004[a] CPAP use ≥ 4hours/ night on ≥ 70% of nights: 48/105 (45.7%) P = .01[a] Consulta-tion with sleep specialist significant predictor of CPAP adherence (1st 30 days of therapy[b])

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Compliance/Adherence	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Lettieri 2011[33] Group 1: Primary care (n = 70) Group 2: Sleep specialist (n = 70) Group 3: Sleep specialist (n = 70)	NR	NR	NR	NR	NR	NR	NR	NR	Hours/night 4.7 (2) P = .98[a] %nights used 70.7% (26) P = .94[a] Effect size vs 2: -0.11 (-0.44, 0.22) Effect size vs 3: -0.07 (-0.4, 0.26) Use > 4 hours/ night for > 70% of nights 54.3% P = .84[a]	Hours/night **G2:** 4.7 (1.1) Effect size: 0 (-0.33, 0.33) **G3:** 4.8 Effect size: -0.05 (-0.4, 0.22) **G2:** 73.2% (18) **G3:** 72.4% (22) **G2:** 51.4% **G3**: 50%
Antic 2009[30] Nurse (n = 100) Usual care (n = 95)	NR	NR	NR	NR	NR	NR	No significant difference between groups in satisfaction with time waiting (P = .71[a]) Effect size: 0.06 (-0.24, 0.36) Patients receiving nurse-led care were more satisfied with their impression of wait time (P = .004[a]) Effect size: 0.46 (0.15, 0.76)		Hours/night 4.11 (SE 0.28) (n = 94)	Hours/night 4.56 (SE 0.30) (n = 81) MD:-0.45 (-1.26, 0.36)

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Compliance/Adherence	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Palmer[34] 2004 Nurse (n = 68) Consultant Clinic (n = 71)	NR	NR	NR	NR	NR	NR	NR	NR	Daily hours of CPAP use Baseline (n = 71) 4.91 (2.85) P = .46[a] Follow-up (n = 63) 5.93 (2.67) Effect size: 0.11 (-0.24, 0.46) Change (n = 58) 0.66 (1.71) P = .5[a] P = .004 from baseline	Daily hours of CPAP use Baseline (n = 71) 5.24 (2.5) Follow-up (n = 63) 5.64 (2.54) P = .54[a] Change (n = 61) 0.45 (1.69) P = .041 from baseline
Scharf 2004[36] Primary care (n = 44) Usual care (n = 59)	NR	NR	NR	NR	NR	NR	Interval between PSG and CPAP study ≤1 m: 8.6% (3/35)	35.3% (18/51) P = .012[a]	Compliant[c] 3 m after onset of treatment all patients: 41% (18/44) RR: 0.8 (0.52, 1.24) Of patients accepting CPAP 62% (18/29) P = NS[a]	Compliant[c] 3 m after onset of treatment, all patients 51% (30/59) P = NS[a] Of patients accepting CPAP 68% (30/44) RR: 0.91 (0.64, 1.29)

[a]between groups;
[b]Mean adherence 58 min higher per day with sleep specialist consultation prior to initial PSG; after adjustment for age, race, BMI, medical insurance, AHI, ESS, CES-D, and education level
[c]compliant defined as use for at least 4h/night 5 nights per week, estimated by the patient over the prior month
MD = mean difference; NS = not statistically significant; NR = not reported; PSG = polysomnography; RR = risk ratio; SE = standard error

Table 6. Intermediate outcomes for KQ1, Continued

Study Intervention (n) Control (n)	Case Finding (describe)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Harms (Overdiagnosis, False Positives/Negatives)		Costs per Patient	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Chai-Coetzer 2013[31] Primary care (n = 81) Usual care (n = 74)	NR	NR	NR	NR	NR	NR	NR	NR	$1819.44	$3067.86
Chamorro 2013[32] Primary care pulmonologist and sleep specialist (n = 96)	Concordance between primary care pulmonologist and sleep specialist kappa = .74, P<.001		NR	NR	NR	NR	NR	NR	NR	NR
Andreu 2012[29] Nurse (n = 22) Sleep pulmonologist (n = 43)	NR	NR	Dryness (54%) Nasal congestion (40%) Abrasions (25%)		NR	NR	NR	NR	Cost per patient €590 (43) Effect size vs B: 8.1 (6.4, 10.1) Effect size vs C 0.75 (0.13, 1.37)	Cost per patient **B:** €849 (11) P<.001 vs A and C **C**: €644 (93) P<.05 vs A
Lettieri 2011[33] Group 1: Primary care (n = 70) Group 2: Sleep specialist (n = 70) Group 3: Sleep specialist (n = 70)	NR	NR	12.9% dis-continued therapy	**Group 2:** 8.6% dis-continued **Group 3**: 10% dis-continued P = .78[a]	NR	NR	NR	NR	NR	NR
Antic 2009[30] Nurse (n = 100) Usual care (n = 95)	NR	NR	NR	NR	NR	NR	NR	NR	Within-trial costs were significantly less with nurse-led care (A$1,111 per patient less)	

Study Intervention (n) Control (n)	Case Finding (describe)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Harms (Overdiagnosis, False Positives/Negatives)		Costs per Patient	
	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control	Non-sleep specialist	Control
Palmer 2004[34] Nurse (n = 68) Consultant Clinic (n = 71)	NR	NR	NR	NR	NR	NR	NR	NR	Total cost (to NHS) of nurse home visit: $83.62 (79.76) Cost to patient was set at $0, no accounting for time off work, *etc*	Total cost to NHS of clinic visit: $9.94 (6.38) Total cost to patient $37.81 (37.13)

[a]between groups
NHS = National Health Service (UK)

Table 7. Study Characteristics for KQ3

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Bakker 2011[40] Crossover RCT Wellington, New Zealand Sleep clinic	APAP vs CPAP for treatment (n = 12) Outcomes assessed after 6 nights with 4-night washout period	Treatment APAP (5-20 cm H_2O) and CPAP with pressure set during manual titration	Inclusion: English-speaking, PAP naïve, morbidly obese (BMI ≥ 40kg/m^2), ≥ 18 years old, AHI ≥ 15/hour, manually titrated pressure ≥ 14 cmH_2O Exclusion: cardiac, respiratory, psychiatric, sleep co-morbidities (including central sleep apnea and those with irregular sleep patterns)	n = 12 Mean age: 45.9 (range 23-59) Male gender, %: 75 BMI: 49.9 (5.2) Obesity, %: 100 ESS: 17.4 (4.7) AHI (/hr): 75.8 (32.7) Mean O_2 desaturation: 8% (4.2)	**Sequence generation:** adequate **Allocation concealment:** not reported **Blinding:** unclear, blinded during data collection but not data entry, patient was blinded **Incomplete outcome data:** adequate **Selective outcome reporting:** adequate **Risk of Bias: Medium**
Lettieri 2011[33] Observational cohort study United States Community Based Hospital and Academic Sleep Center	**Group 1** (n = 70): unattended Type III home sleep study and home APAP titration (not included for KQ3 comparison) **Group 2** (n = 70): in-lab Type I attended sleep study and in-lab CPAP titration **Group 3** (n = 70): in-lab Type I sleep study, unattended home APAP titration 4-6 week follow-up	Titration All treated with CPAP, titration via home APAP or in-lab CPAP	Inclusion: diagnosed with OSA by HST or PSG (according to AASM guidelines), eligible for home sleep study program (≥ 2 high-risk features such as habitual snoring, daytime fatigue, nonrestorative sleep, weight gain, and witnessed apneas; no suspicion of concomitant sleep disorders and no significant underlying comorbidities), diagnosed OSAS defined as AHI > 5 with compatible symptoms Exclusion: not eligible for HST (cardiopulmonary disease, heart failure, CAD, previous cerebrovascular accident, poorly controlled asthma, moderate to severe COPD (FeV1 < 50%), supplemental oxygen requirement)	n = 140 (groups 2 and 3 only) Group 2: n = 70 Mean age: 47.1 (8) Male gender, %: 71.4 BMI: 30 (3.5) ESS: 14.1 (4.2) Fatigue: 6.7 (1.7) AHI (/hr): 23.1 (13) Group 3: n = 70 Mean age: 45.5 (5.4) Male gender, %: 68.6 BMI: 28.5 (3) ESS: 13.9 (4.4) Fatigue: 6.5 (1.4) AHI (/hr): 19.3 (9.4)	**Selection bias:** inadequate; unclear how patients in Groups 2 and 3 were selected to achieve same number as in Group 1; participants in all groups had to meet the same criteria for HST and APAP **Blinding of outcome assessment:** NR (adherence was objective measure) **Intention-to-treat analysis:** adequate after exclusions for Group 1 and selection of equal number for Groups 2 and 3 **Attrition bias:** adequate **Selective outcome reporting:** adequate **Risk of Bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Drummond 2010[43] RCT US VA Medical Center	Empiric APAP (n = 54 randomized, 42 completed) Usual care (n = 55 randomized, 44 completed) 1 month	Treatment APAP: cost-free auto-CPAP unit on day of randomization; returned to clinic at 1 month for assessment; remained on APAP and awaited in-lab PSG and CPAP titration; final assessment 1 month after PSG Usual care: 2nd assessment at 1 month after randomization; waited for in-lab PSG with CPAP titration; returned after 1 month of CPAP for assessment	Inclusion: consecutive patients referred for PSG; ≥ 2 categories of Berlin questionnaire positive Exclusion: age > 80; history of CHF; MI in past 6 months; COPD with FEV_1<60% predicted; stroke; alternative sleep diagnosis; prior diagnosis of OSA	N = 109 randomized, 86 completed protocol Mean age: 55 Male gender, %: 93 Race: African American: 32%, Caucasian: 68% BMI: 35.1 ESS: 14.4	**Sequence generation:** NR **Allocation concealment:** adequate **Blinding**: No **Incomplete outcome data:** 86 (79%) completed protocol; reported using intention-to-treat analysis with last observation carried forward **Selective outcome reporting:** No **Risk of bias**: **Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
McArdle 2010[38] RCT Australia Tertiary hospital sleep service	Manual titration (n = 83); in-lab CPAP titration with full PSG monitoring Home APAP (n = 86); used APAP overnight at home Lab APAP (n = 80); APAP titration in-lab without full PSG (outcomes not extracted; in-lab APAP was not comparison of interest) 4 weeks	Titration All received fixed CPAP at pressure determined by sleep specialist	Inclusion: symptoms of OSA (ESS ≥ 8, AHI ≥ 15 events/hr), age 17-85, living near sleep service and no previous treatment for OSA Exclusion: BMI > 45, significant lung or cardiac disease, neuromuscular disease, previous stroke, predominant central sleep apnea, periodic leg movements > 15/hr, severe medical illness or planned surgery, language impairment, or psychiatric illness	Manual: n = 83 Mean age: 50 (12) Male gender,%:75 BMI: 32.4 (5.7) Hypertension: 34% Diabetes: 11% ESS: 14.1 (4) AHI (/hr): 38 Time oxygen saturation < 90%, min: 5 Home APAP: n = 86 Mean age: 50 (12) Male gender, %: 59 (69) BMI: 32.2 (5.2) Hypertension: 29% Diabetes: 15% ESS: 13.8 (4.1) AHI (/hr): 38 Time oxygen saturation < 90%, min: 2	**Sequence generation:** adequate **Allocation concealment:** opaque envelopes **Blinding:** adequate **Incomplete outcomes reporting**: per protocol and ITT analysis, some outcomes not reported as ITT **Selective outcome reporting**: data not given for all outcomes **Risk of bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Vennelle 2010[61] RCT (crossover) UK, Sleep center	APAP vs CPAP (n = 192 randomized, 181 completed) Outcomes assessed after each 6-week treatment period No washout period so no data from first 2 weeks of each study arm were included in analysis	Treatment Same CPAP device with 2 modes: fixed-pressure mode (determined during overnight in-lab CPAP titration) and variable pressure mode	Inclusion: diagnosis of OSAHS; ESS ≥ 10 or history of troublesome sleepiness when driving, AHI ≥ 15 on PSG or ≥ 25 apneas and hypopneas per hour in limited sleep study, age 18-70, no previous CPAP use Exclusion: severe neurological deficit sufficient to compromise CPAP usability or understanding; significant comorbidity such as severe COPD, stroke, unstable diabetes, or active angina; coexisting narcolepsy or periodic limb movement syndrome; contraindications to CPAP use including recent pneumothorax	N = 200 randomized, 181 analyzed Mean age: 50 (10) Male gender, %: 77 BMI: 34.5 (7.8) ESS: 14 (3) Mean AHI (/hr): 33 (18) among n = 123 who had PSG	**Sequence generation**: adequate **Allocation concealment**: adequate **Blinding:** adequate (patients, staff involved in data acquisition or analysis) **Incomplete outcomes reporting**: 9.5% did not complete study (19/200) **Selective outcome reporting:** adequate **Risk of Bias: Low**
Damjanovic 2009[41] RCT (controlled parallel group study) Germany	Standard support and APAP (n = 25) Standard support CPAP (n = 25) Intensive support APAP (n = 25) Intensive support CPAP (n = 25) 3- and 9-month follow up	Treatment CPAP pressure was the pressure level with the lowest RDI during polysomnography Intensive support groups visited by specially trained members of authors' sleep lab at 1, 2, 4, 5, and 6 months to optimize treatment and provide support	Inclusion: newly diagnosed OSAS patients, AHI ≥ 15, with or without corresponding daytime symptoms Exclusion: any global respiratory failure, central sleep apnea, severe mental or psychological impairment	n = 100 randomized, 78 at 9 months Mean age: 57 (12) Male gender, %: 78 BMI: 31 (5) APAP: n = 50 ESS: 8.5 (0.8) AHI (/hr): 41.8 (3.5) CPAP: n = 50 ESS: 9.3 (0.7) AHI (/hr): 45.5 (3.6)	**Sequence generation**: NR **Allocation concealment**: NR **Blinding:** NR **Incomplete outcomes reporting**: 22% (22/100) with no follow-up at 9 months; difference between intensive and standard support groups **Selective outcomes reporting**: adequate **Risk of bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Galetke 2008[45] RCT (crossover) Germany, university-associated sleep laboratory	APAP vs CPAP (n = 20) Outcomes assessed after 8 weeks of a treatment with full in-lab sleep study after 16 weeks	Treatment Conventional CPAP at fixed pressure obtained during manual titration and APAP therapy (responds to snoring apneas/hypopneas and inspiratory flow limitation), range 4-15 cmH_2O One machine with 2 modes	Inclusion: OSAS newly diagnosed with AHI > 10/h, based on full in-laboratory PSG data and clinical symptoms Exclusion: COPD, CHF, acute neurological or psychiatric disorders, other major intrinsic sleep disorders, or malignant diseases	n = 20 Mean age: 55.5 Male gender, %: 80 BMI: 29.3 ESS: 10.3 (5.7) AHI (/hr): 32.9 (19.1) Arousals/hr: 17.6 (9.2) Snoring, n of epochs: 436.3 (209.6) SaO_2 min, %: 77.8 (8.4)	**Sequence generation**: NR **Allocation concealment**: NR **Blinding:** single blind (patients); data analysis either automated or done by technologists not involved in study **Incomplete Outcome**: adequate **Selective reporting**: adequate **Risk of bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Fietze 2007[44] RCT (titration done as crossover, but treatment randomized) Germany	APAP (n = 10) CPAP (n = 11) Outcomes assessed after 6 weeks of treatment	Treatment Titration done as a crossover over 2 nights, both APAP and CPAP titration done in-lab Treatment with second titration device was continued for 6 weeks; APAP set between 4 and 16 cmH_2O	Inclusion: suspected sleep apnea; if AHI > 10/hr in home cardiorespiratory polygraph and symptoms of excessive sleepiness or AHI > 20/hr patients had PSG in lab; patients included if AHI ≥ 10/hr; if AHI > 10/hr at home and AHI <10/hr in lab included if also had excessive sleepiness; BMI <40; age 35-70 Exclusion: other sleep disorders (including leg movements), acute cardiac, pulmonary or other internal medicine-related disorders, acute psychiatric or neurological disorders, or abuse of sleep-inducing agents or other drugs; suspected or confirmed central sleep apnea; previous treatment (*eg,* CPAP, oral devices, or uvulopalatopharyngoplasty)	n = 21 Mean age: 54.2 (11.7) Male gender, %: 95 BMI: 30.9 (5.7) APAP: n = 10 AHI: 43.3 (30.2) Sleep latency, min: 17.7 (13.6) Total sleep time, min: 355.7 (27.9) CPAP: n = 11 AHI: 40.4 (26.1) Sleep latency, min: 11.2 (6.4) Total sleep time, min: 379.5 (63.8)	**Sequence Generation**: NR **Allocation Concealment**: NR **Blinding**: NR **Incomplete Outcomes**: adequate **Selective Reporting**: adequate **Risk of Bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Meurice 2007[50] RCT France Sleep laboratories	**Group 1** (n = 17 randomized, 14 at 6 months): fixed CPAP **Group 2** (n = 17 randomized, 13 at 6 months): GK 418P APAP device **Group 3** (n = 17, 15 at 6 months): AutoSet device **Group 4** (n = 17, 12 at 6 months): PV10i device **Group 5** (n = 15, 11 at 6 months): Somnosmart 1 device 6 months	Treatment Fixed CPAP pressure manually determined during laboratory titration, APAPs all set in auto-adjust mode during the titration night All patients treated at home for 6 months with machine they used during titration night	Inclusion: naïve to nasal CPAP, no nasopharyngeal surgery, AHI > 30/hr or > 10 micro-arousals/hr Exclusion: > 20% of respiratory disturbances characterized as central events or taking sedative treatments	n = 83 at randomization, n = 65 at 6 months Mean Age: 56 (10) BMI: 30.8 (5.3) AHI (/hr): 52.3 (17.8)	**Sequence Generation:** adequate **Allocation Concealment:** adequate **Blinding:** unclear **Incomplete outcome reporting:** adequate, > 10% dropped out but balanced and reasons given **Selective outcome reporting**: adequate **Risk of Bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Mulgrew 2007[39] RCT Canada Tertiary referral sleep disorders program	In-lab CPAP titration (n = 35 assigned, 30 completed) Auto-CPAP titration (n = 33 assigned, 31 completed) 3-month follow-up	Titration For ambulatory APAP group CPAP set at 95%	Inclusion: adults referred from catchment area of sleep disorders program at University of British Colombia Hospital for assessment of suspected OSA who have clinical suspicion of moderate to severe OSA; high pretest probability of moderate to severe OSA, medically stable, not taking sedative medications Exclusion: pregnant, FEV1 or FVC <70%, known cause for daytime sleepiness, life-threatening comorbid illness, major psychiatric disorder, MVA attributable to hypersomnolence in preceding 5 years, previous treatment for OSA, contraindication for nasal CPAP, inability to provide informed consent	n = 68 CPAP: n = 35 Mean age: 52 (11) Male gender, %: 75 BMI: 38 (8) Median ESS: 14 (11-19IQR) Median RDI: 31 (21-47IQR) Median SACS: 30 (18-42IQR) Auto-CPAP: n = 33 Mean age: 55 (10) Male gender, %: 79 BMI: 39 (9) Median ESS: 14 (12-16IQR) Median RDI: 27 (17-57IQR) Median SACS: 32 (22-48)	**Sequence Generation:** inadequate, block randomized using large envelopes with folded cards inside **Allocation concealment:** inadequate **Blinding:** NR **Incomplete outcome reporting**: adequate **Selective outcome reporting:** adequate **Risk of Bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Nolan 2007[51] RCT (crossover) Ireland Respiratory sleep disorders unit	APAP (n = 29) CPAP (n = 29) (n = 34 enrolled, 29 completed) Outcomes assessed after each 8-week treatment period	Treatment CPAP therapy pressure calculated from overnight lab-based autotitration study (95% percentile) Variable pressure set between 4-20 cmH_2O	Inclusion: consecutive patients from sleep disorders unit with newly diagnosed mild to moderate OSAS (AHI ≥ 5 and <30) and compatible clinical features; awaiting a trial of CPAP therapy, ESS score ≥ 7 Exclusion: known cardiovascular disease other than hypertension, previous CPAP therapy, preexisting chronic airways disease, or previous upper airway surgery	n = 29 Mean age: 52.8 (8.3) Male gender, %: 90 BMI: 29.9 (4.7) Blood pressure, mmHg: 132/84 (23/13) Neck circumference (cm): 42 (2)	**Sequence generation**: not reported **Allocation concealment**: adequate **Blinding:** adequate (investigator blinded; patient partially blinded) **Incomplete outcomes**: 5/34 (15%) dropped out, 1 due to side effects, 4 lost to follow-up **Selective reporting**: adequate **Risk of Bias: Medium**
Patruno 2007[55] RCT Italy	Fixed level CPAP (n = 16) APAP (n = 15) Treated for 3 months	Treatment CPAP: pressure determined during titration APAP: pressure set to deliver levels from 4 to 15 cmH_2O Repeat sleep study at end of 3-month treatment	Inclusion: newly diagnosed OSA (AHI > 20/h and diurnal hypersomnolence [ESS score > 12]); free of diseases other than arterial hypertension; never treated for OSA Exclusion: taking treatments other than ACE inhibitors, calcium channel clockers, and diuretics	n = 31 (n = 40 were enrolled, 9 were excluded and not analyzed) Mean age: 48 Male gender, %: 81 BMI: 36.5 ESS: 15 (2.7) AHI (/hr): 46.5 (13.5) SaO_2, mean, %: 90 SaO_2, nadir, %: 72 Hypertensive: n = 17 BP, systolic mmHg: 143 (10) BP, diastolic mmHg: 87 (5) Glucose, mg/dL: 103.9 (6.8)	**Sequence generation**: NR **Allocation Concealment**: NR **Blinding:** compliance recorded by the computer; other outcomes NR **Incomplete Outcome**: not ITT, > 10% attrition with reasons, balance NR **Selective Reporting**: adequate **Risk of Bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Richard 2007[58] Retrospective cohort Netherlands	CPAP (n = 78) APAP (n = 96) Follow-up: 2 months to 8 years, unclear when data collected	Treatment	Inclusion: all patients with OSAS (defined as AHI > 5 in overnight PSG accompanied by daytime symptoms) offered nCPAP between Jan 1997 and July 2005; if AHI > 30 – offered nCPAP as 1st treatment; if AHI<30 – offered alternative treatments (oral device, surgery) Exclusion: none reported	n = 174 Mean age: 56.7 Male gender, %: 80.5 BMI: 33 CPAP: n = 78 AHI (/hr): 47.2 (22.3) ESS: 5.6 (4.5) APAP: n = 96 AHI (/hr): 52.0 (23.1) ESS: 7.1 (5.1)	**Selection bias:** unclear **Blinding of outcome assessment:** NR **Intention-to-treat analysis:** inadequate **Attrition bias:** adequate **Selective outcome reporting:** adequate **Risk of Bias: Medium**
Nolan 2006[52] quasi RCT crossover (all patients on CPAP then random crossover assignment of 3 APAP devices) Ireland University sleep disorders center	CPAP vs 3 APAP devices (n = 27) Baseline values based on median of 53 months of CPAP; Outcomes assessed after 4-week home trial with each of 3 APAP devices	Treatment APAP a) Autoset Spirit (reviews shape of inspiratory flow curve on breath-by-breath basis) b) Breas PV 10i (creates model of patient's breathing signal and compares to template to set device) c) RemStar Auto (compares inspiratory flow shape to rolling patient database) CPAP Different devices, used for 37-85 months prior to start of study	Inclusion: attending Respiratory Sleep Disorders Unit, confirmed diagnosis of OSAS, already established on fixed-pressure CPAP with nasal mask and device that downloaded time-coded compliance data Exclusion: malignant or psychiatric disease; on regular narcotics, sedatives, or psychoactive medications	n = 27 Mean age: 53 Male gender, %: 93 BMI: 36.2 Diagnostic AHI(/h): 48 (29-76) Diagnostic ESS: 15 (9-19)	**Sequence generation**: NR (Note: sequence generation only for 3 APAP devices) **Allocation concealment**: adequate **Blinding:** investigator performing analysis and person assigning APAP devices; patients were not informed about APAP technologies but were told they were newer treatment machines **Incomplete outcome data**: No patients lost to follow-up **Selective outcome reporting**: No **Risk of bias: Low**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Nussbaumer 2006[54] RCT (crossover) Switzerland Outpatient clinic	APAP vs CPAP (n = 34 randomized, 30 completers) 1 month	Treatment APAP pressure ranged from 5 to 15 cmH_20, CPAP pressure set at 90^{th} percentile	Inclusion: consecutive patients with excess sleepiness and AHI > 10 /hr Exclusion: CHF, chronic rhinitis, other sleep disorders	n = 34, data for 30 completers Mean age: 49 (SE2) Male gender, %: 90 BMI: 31.3 (SE.6) ESS: 12.7 (0.6) AHI (/hr): 41.1 (3.6)	**Sequence generation**: adequate **Allocation concealment**: adequate **Blinding:** double-blind (patients and attending physicians) **Incomplete outcome data**: 4 (12%) did not complete protocol **Selective outcome reporting:** No **Risk of bias: Low**
West 2006[62] RCT UK Outpatient sleep clinic	**Group 1** (n = 31): Auto-titration pressure **Group 2** (n = 33): Fixed pressure **Group 3** (n = 34): Fixed pressure 6 months	Treatment Autotitration pressure (Group 1), fixed pressure determined by the 95% from 1 week of autotitration (Group 2), and fixed pressure determined by algorithm based on neck size and dip rate (Group 3)	Inclusion: aged 18-75 years with excessive daytime sleepiness (ESS > 9) and proven OSA on 1 night respiratory PSG; > 10 dips /hr in SaO_2 of > 4% confirmed as being caused by upper airway obstruction eligible for inclusion; no exclusion on basis of other co-morbidities Exclusion: respiratory failure requiring urgent treatment	n = 98, 86 at 6 months Mean age: 46 Male gender, %: 85 Maintenance of Wakefulness test, mins: 18 4% oxygen saturation dips, events/h: 34 Mean BP mm Hg: 96	**Sequence generation**: adequate **Allocation concealment**: unclear **Blinding:** patients and the outcomes assessors **Incomplete outcome data**: Unclear if the analyses include all randomized. Reasons for dropout were reported. **Selective outcome reporting**: no **Risk of bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Hukins 2004[46] RCT (crossover) Australia Hospital's sleep disorders center	APAP (n = 32) CPAP (n = 23) 2-month treatment period with outcomes assessed last 30 days	Treatment Fixed-pressure (CPAP) or autotitrating (APAP) mode of the AutoSet T (default pressure 4-20 cmH_2O) Received each treatment for 2 months, outcomes reported for last 30 days of those 2 months to allow for washout period	Inclusion: AHI ≥ 5 in association with hypersomnolence, optimal CPAP pressure determined by overnight pressure determination PSG, no previous home use of CPAP, and informed consent Exclusion: significant comorbidity (unstable ischemic heart disease, neuromuscular disease, kyphoscoliosis, or severe COPD), significant complication (hypercapnic respiratory failure or right heart failure), presence of non-obstructive sleep apnea, or inability to use masks compatible with Autoset T	n = 55 APAP: n = 32 Mean age: 51 (11.9) Male gender, %: 84 BMI: 35.8 (6.7) ESS: 13 (5) Diagnostic AHI: 59.7 (30.1) CPAP: n = 23 Mean age: 49.3 (12.5) Male gender, %: 91% BMI: 34.3 (6.3) ESS: 11.8 (5.3) Diagnostic AHI: 50.2 (24.9)	**Sequence generation**: adequate (shuffled sealed envelopes) **Allocation concealment**: adequate **Blinding:** attempted to blind patients (used same machine for APAP and CPAP) **Incomplete Outcome**: no, more than 10% attrition, no reasons given **Selective reporting**: unclear **Risk of bias: Medium**
Hussain 2004[47] RCT (crossover) Canada Unclear	Fixed CPAP vs Autotitrating CPAP (n = 10) 4 weeks separated by a 2-week washout period	Treatment APAP set between 3-20 cm H_2O, fixed CPAP pressure determined by overnight titration	Inclusion: CPAP-naïve patients with symptomatic OSAH (AHI > 15/h) Exclusion: none reported	n = 10 Mean age: 44.9 (9.7) Male gender, %: 90 BMI: 35.9 (12.9) ESS: 11.1 (6.4) AHI (/hr): 47.2 (35.6) Snoring: 100% Unrefreshing sleep: 80% Witnessed apnea: 80% Excessive daytime sleepiness: 70% Arousal index: 17.3 (17.7) Desaturation index: 53 (36)	**Sequence Generation:** not reported **Allocation concealment**: not reported **Blinding:** only patients blinded, compliance collected by machine **Incomplete outcome reporting:** adequate **Selective outcome reporting**: adequate **Risk of Bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Marrone 2004[48] RCT (crossover) Italy University sleep center	Fixed CPAP vs APAP (n = 22) 1 month	Treatment APAP pressure set to range between 4-18 cmH_20, CPAP level determined during PSG with APAP titration in lab	Inclusion: patients referred for suspected OSAS and consecutive subjects with AHI ≥ 30 and no overt cardiopulmonary disease were requested to participated in study (all accepted) Exclusion: none reported	n = 22 Mean age: 53.4 Male gender, %: 95 BMI: 32.6 ESS: 16.3 (5)	**Sequence generation**: NR **Allocation concealment**: NR **Blinding:** patients **Incomplete outcome data**: NR **Selective outcome reporting**: No **Risk of bias: Medium**
Masa 2004[37] RCT Spain Sleep centers	**Standard Titration** (n = 126 randomized, 107 analyzed): in-lab CPAP titration **AutoAdjusted Titration** (n = 119 randomized, 106 analyzed): at home APAP titration **Predicted Formula Titration** (n = 115 randomized, 102 analyzed): used a formula to calculate optimal pressure (did not extract outcomes for this group) 12 weeks	Titration Standard vs home titration	Inclusion: requiring CPAP treatment (AHI ≥ 30, ESS ≥ 12), age 18-70 Exclusion: psychophysical incapacity to perform questionnaires; chronic disease; drug or alcohol addiction; Cheyne-Stokes syndrome; life-threatening SAHS; previous uvulopalatopharyngoplasty; absence of a partner at home; important chronic nasal obstruction; lack of skill in adjusting nasal mask in daytime CPAP trial; refusal to participate	Standard: n = 107 Mean age: 51 (9.1) Male gender, %: 86.9 BMI: 33.6 (8.4) HTN: 55.4% Sleep, hr/nt: 6.9 (1.1) Habitual snoring: 90.7% Apneas observed: 62.6% Nocturia: 23.4% Restlessness: 47.7% Morning headache: 14% AutoAdjusted: n = 106 Mean age: 52.2 (10.4) Male gender, %: 89.6 BMI: 33.1 (6.3) HTN: 57.4% Sleep, hr/nt:7.0 (1.5) Habitual snoring: 85.8% Apneas observed: 58.5% Nocturia: 31.1% Restlessness: 43.4% Morning headache: 12.3%	**Sequence Generation:** not reported **Allocation concealment**: not reported **Blinding:** not reported **Incomplete outcome reporting:** adequate, > 10% dropout but reasons given and not significantly uneven by groups **Selective Outcome reporting:** adequate **Risk of bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Noseda 2004[53] RCT (crossover) Brussels, Belgium Hospital	Auto CPAP vs CPAP for treatment (n = 27 randomized 24 evaluable) 8 weeks	Treatment Fixed CPAP set at the pressure judged to be effective during the titration night at the sleep laboratory, in the auto CPAP mode the pressure was set between 4-14 cm H_2O	Inclusion: high pressure variability during 14 day run-in period on APAP (VI > 2.75cm H_2O), AHI > 20/hr and a microarousal index (MAI) > 30 Exclusion: previous treatment with CPAP, central sleep apnea or Cheyne-Stokes respiration, major facial or pharyngeal anatomic abnormalities likely to require surgery, night or rotating shift work, severe chronic heart failure or COPD, seizure disorder, mental retardation, sedative, hypnotic or antidepressant therapy, previous uvulopalatopharyngoplasy, prolonged hypoventilation during REM sleep	n = 27 Mean Age: 49 (10) BMI: 32.3 (4.9) ESS: 10.7 (2.4) AHI (/hr): 50.9 (25.2) AI: 24.6 (22.6) MAI: 43 (12.9)	**Sequence Generation:** unclear, a randomization table was used **Allocation concealment:** unclear **Blinding:** single blind **Incomplete outcome reporting**: > 10% dropped out but balanced **Selective outcome reporting**: adequate **Risk of Bias: Medium**
Massie 2003[49] RCT (crossover) Multi-site Unclear	CPAP vs APAP as treatment (n = 46 randomized, 44 completed) 6 weeks	Treatment CPAP: fixed pressure as determined by board-certified sleep specialist or equivalent (by AASM standards) APAP: pressure ranged between 4-20 cm H_2O	Inclusion: need for CPAP pressure > 10cm, symptomatic OSAHS with AHI ≥ 15, age 18-65 Exclusion: preexisting lung disease, awake resting SaO_2 <90%, or ≥ 10 central apnea hypopnea events per hour, taking meds known to significantly interfere with sleep or respiration	n = 46 randomized, 44 completed Mean age: 49 (10) Male gender, %: 82 BMI: 32 (4)	**Sequence generation:** not reported **Allocation concealment**: not reported **Blinding**: not reported **Incomplete outcome reporting:** adequate **Selective outcome reporting**: adequate **Risk of bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Planès 2003[56] RCT France Four sleep laboratories	Auto-nCPAP, initiated at home (n = 16) Conventional nCPAP, initiated in sleep lab with titrating PSG (n = 14) 2 months	Treatment nCPAP, conventional and auto APAP home pressure set to 2 cmH_2O above to 4 cmH_2O below max pressure delivered by device during 1st week (at least 15 hours) of use	Inclusion: severe obstructive OSAS with AHI ≥ 30 events/hour and obstructive events > 80% of total events, clinical indications for nCPAP according to American Thoracic Society recommendations Exclusion: none reported	N = 35 recruited Mean age: 54.3 Male gender, %: 77 BMI: 32.4 ESS: 14.8 Hypertension: n = 7 No history of nCPAP or surgery for snoring No comorbidities noted n = 30 with outcomes Conventional: AHI (/hr):61.0 SaO_2: 12.7 Auto: AHI (/hr):57.5 SaO_2: 24.9	**Sequence generation:** NR **Allocation concealment**: NR **Blinding**: No **Incomplete Outcome Reporting**: 5/35 didn't complete treatment (unable to tolerate nCPAP) **Selective outcome reporting**: No *patients who didn't tolerate their assigned treatment were allowed to switch interventions… only one did auto to conventional **Risk of bias: Medium**
Senn 2003[59] RCT (cross-over) Switzerland	AutoAdjust LT vs AutoSet T vs Fixed-Pressure CPAP mode (n = 29) 2-week adaptation period with either APAP device then 1 month with each in random order, outcomes assessed at end of each month	Treatment AutoAdjust LT responds to apnea-hypopnea and snoring, AutoSet T responds to apnea-hypopnea, snoring and changes in inspiration flow contour, fixed-pressure CPAP mode is either APAP set in fixed mode	Inclusion: OSAS based on complaints of excessive sleepiness, snoring, and apnea-hypopnea index > 10/hr Exclusion: not naïve to CPAP therapy	n = 31 recruited, 29 completed Mean age: 53 Male gender, %: 79 BMI: 33.3 ESS: 14.2 (0.7) AHI (/hr): 45.8 (4.2) Time with SaO_2 <90%, % time in bed: 12.6 (3.4)	**Sequence generation**: NR **Allocation concealment**: NR **Blinding**:single-blind (patients blinded to study purpose and treatment modes) **Incomplete outcome reporting**: adequate **Selective outcome reporting**: adequate **Risk of bias: Medium**

Author, year Study design Location / Setting	Intervention Groups Follow-up	Aim of Study Treatments Received	Inclusion/ Exclusion Criteria	Patient Characteristics (expressed in means unless otherwise noted)	Risk of Bias
Randerath 2001[57] RCT (crossover) Germany University sleep laboratory	APAP vs CPAP (n = 52 randomized, 47 completed study) Outcomes assessed after each 6-week treatment period	Treatment APAP using forced oscillation set to between 4 and 18 cmH_2O CPAP using the pressure titrated during diagnostic polysomnography	Inclusion: referred to a university sleep laboratory by "pneumologists" and general practitioners, OSA diagnosed (AHI ≥ 10) from PSG, underwent basic lung function examination Exclusion: 1 patient excluded after bronchial carcinoma diagnosed	n = 52 enrolled, 47 completed Mean age: 54.7 (10.1) Male gender, %: 87 BMI: 32.4 (5.8) AHI (/hr): 35.1 (26) Snoring(/hr): 49 (36) Total number of arousals (/hr): 34.0 (21.7)	**Sequence generation**: not reported **Allocation Concealment**: not reported **Blinding:** adequate (patients, physicians, and technicians) **Incomplete outcome reporting**: adequate (5/52 [10%] quit study **Selective outcome reporting**: adequate **Risk of Bias: Medium**
D'Ortho 2000[42] RCT (cross-over) France	APAP vs CPAP (n = 25) Outcomes assessed after each 2-month treatment period	Treatment Constant CPAP or auto-CPAP mode of "REM + Auto" apparatus CPAP titration done in lab to identify effective pressure for constant CPAP APAP range set at 6-16 cmH_2O	Inclusion: clinical suspicion of OSAS confirmed by PSG, AHI > 10/h of sleep with obstructive events > 80% of total events and clinical indication for CPAP treatment according to American Thoracic Society recommendations Exclusion: restless legs, cardiac failure, cerebrovascular disease, or lung disease	n = 25 Mean age: 57 (11) Male gender, %: 88 BMI: 32 (5) ESS: 12.7 (5.3) Sleep onset latency, min:37 Total sleep time, min: 375 (65) Arousal/awakening index, events(/h): 45.6 (25.8) AHI (/hr): 57.8 (5.8) Mean SaO_2, %: 93 (3.0)	**Sequence generation**: NR **Allocation concealment**: NR **Blinding**: single blinded (patients) **Incomplete outcome reporting:** adequate **Selective outcome reporting:** adequate **Risk of Bias: Medium**
Teschler 2000[60] RCT (crossover) Australia	APAP vs CPAP as treatment (n = 10) Outcomes assessed and PSG every 2 months	Treatment APAP was CPAP device operated in auto mode CPAP pressure determined during manual titration night following diagnostic night	Inclusion: newly diagnosed moderate to severe OSAS (AHI > 20/hour); residence within 50 km of clinic Exclusion: primary diagnosis of asthma, emphysema, allergic rhinitis, or cardiac failure	n = 10 Mean age: 52.2 (2) Male gender, %: 100 BMI: 33.8 (1.3) AHI (/hr): 52.9	**Sequence generation**: unclear **Allocation concealment**: unclear **Blinding:** double-blind (patients, staff) **Incomplete outcome data**: No reported missing data **Selective outcome reporting**: No **Risk of bias: Medium**

CPAP = continuous positive airway pressure; CVA = cerebrovascular accident; ESS = Epworth Sleepiness Scale (cut-off score of 8 or more suggests the presence of at least mild daytime sleepiness); MI = myocardial infarction; ODI = oxygen desaturation index; OSA = obstructive sleep apnea; OSAH = obstructive sleep apnea-hypopnea; OSAHS = obstructive sleep apnea-hypopnea syndrome; OSAS = obstructive sleep apnea syndrome; PSG = polysomnogram; RDI = respiratory disturbance index; AASM = American Academy of Sleep Medicine; VI = variability index; MAI = micro arousal index

Table 8. Clinical Outcomes for KQ3

Study Intervention (n) Control (n)	All-cause Mortality % (n/N)		Resource Utilization (hospitalization, etc)		Access to Care		MID, Sleep Symptom Scores		MID, Urinary Symptom Scores	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Drummond 2010[43] APAP (n = 54) Usual care (n = 55)	No deaths		Hospitalized for chest pain 5/43 (12%)	4/44 (9%)	NR	NR	NR	NR	NR	NR
McArdle 2010[38] Manual CPAP titration (n = 83) Home APAP titration (n = 86) -all outcomes per protocol NOT ITT unless specified	NR	NR	Humidifiers/ pt, 4 weeks 0.65 (0.61) Chin straps, 4 weeks 0.26 (0.47) Staff time/pt (min) Technologist:, titration morning 14 (9.1) Physician, titration study reporting 12.7 (4.9)	0.49 (0.53) ES: -0.3 (-0.02, -0.58) P = NS 0.63 (0.66) ES: -0.65 (-0.96, -0.34) P = .001 10.1 (6.8) ES: 0.48 (0.18, 0.79) P = .01 1.3 (4.5) ES: 2.42 (2.02, 2.80) P<.001 All other measures of staff time/pt: P = NS	NR	NR	NR	NR	NR	NR
Vennelle 2010[61] APAP and CPAP (n = 192 randomized, 181 analyzed)	One person died for reasons unrelated to the trial		Patients sought help from sleep center 13 times	25 times (P = .70)	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	All-cause Mortality % (n/N)		Resource Utilization (hospitalization, etc)		Access to Care		MID, Sleep Symptom Scores		MID, Urinary Symptom Scores	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Richard 2007 APAP (n = 96) CPAP (n = 78)	5/232 patients who returned questionnaires died before post-treatment evaluation (group not reported)		NR	NR	NR	NR	NR	NR	NR	NR
West 2006[62] Group 1, APAP (n = 31) Group 2, 1 wk titration CPAP (n = 33) Group 3, algorithm CPAP (n-34)	NR	NR	There was no difference between the groups in terms of the number of extra calls or extra visits made to the sleep nurses because of CPAP problems		NR	NR	NR	NR	NR	NR
Hukins 2004[46] APAP and CPAP (n = 55)	NR	NR	Unplanned contacts: 21 (15 clinic, 6 phone) Total duration of unplanned contacts: 440 minutes	18 (11 clinic, 7 phone) P = .73 455 minutes P = .56	NR	NR	NR	NR	NR	NR
Senn 2003[59] Auto Adjust and AutoSet and Fixed (n = 29)	NR	NR	NR	NR	NR	NR	ESS: clinically relevant change defined as change by 2 points All treatment modalities improved scores by > 5 points.		NR	NR

[a]APAP: a) RemStar Auto, b) Autoset Spirit, c) Breas Pv 10i

ES = effect size; ESS = Epworth Sleepiness Scale; NR = not reported

Table 9. Clinical Outcomes for KQ3, Continued

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Bakker 2011[40] CPAP and APAP (n = 12)	NR	NR	6 preferred APAP, 3 preferred CPAP, 3 had no preference		NR	NR	NR	NR	NR	NR
McArdle 2010[38] Manual CPAP titration (n = 83) Home APAP titration (n = 86) - all outcomes per protocol NOT ITT unless specified	SF-36 Physical Baseline: 58 (median) (n = 62) Week 4: 73 (n = 59) Change: 7.8 (18.6) (n = 58) SF-36 Mental Baseline: 53 (median) (n = 62) Week 4: 70 (n = 59) Change: 11.4 (15.0) (n = 58)	SF-36 Physical Baseline: 57 (median) (n = 62) Week 4: 66 (n = 60) P = NS between groups Change: 7.5 (13.5) (n = 60) ES: 0.02 (-0.34, 0.38) SF-36 Mental Baseline: 54 (median) (n = 62) Week 4: 68 (n = 60) P = NS between groups Change: 8.4 (14.2) (n = 60) ES: 0.21 (-0.15, 0.57)	NR	NR	NR	NR	Trails A, sec Baseline: 28 (median) (n = 60) Week 4: 26 (n = 60) Trails B, sec Baseline: 74 (median) (n = 59) Week 4: 73 (n = 58)	Trails A, sec Baseline: 28 (median) (n = 62) Week 4: 26 (n = 61) P = NS between groups Trails B, sec Baseline: 71 (median) (N = 62) Week 4: 73 (n = 61) P = NS between groups	NR	NR

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	**CPAP**	**APAP**	**CPAP**	**APAP**	**CPAP**	**APAP**	**CPAP**	**APAP**	**CPAP**
Vennelle 2010[61] APAP and CPAP (n = 192, n = 181 analyzed)	SF-36 58 (SEM 0.1) P = NS difference between groups for any SF-36 components	SF-36 58 (SEM 0.1) P = .9	Preferred by 69/181 (38%)	Preferred by 72/181 (40%) P = NS 40/181 (22%) had no preference Significant order effect (P = .009)	NR	NR	NR	NR	NR	NR
Galetke 2008[45] APAP and CPAP (n = 20)	NR	NR	Preferred by 13/20 (65%)	Preferred by 7/20 (35%) P<.01	NR	NR	NR	NR	NR	NR
Fietze 2007[44] APAP n = 10 CPAP n = 11	SF-36 Psychic (Mental Health): Baseline: 50.7 (6.5) 6-week: 52.3 (9.1) Bodily (Physical Health): Baseline: 46.4 (11.8) 6-week: 49 (10.2) Did not differ between CPAP and APAP groups		NR	NR	NR	NR	NR	NR	NR	NR
Meurice 2007[50] At 6 months Group 1, n = 14 Group 2, n = 13 Group 3, n = 15 Group 4, n = 12 Group 5, n = 11	SF36 (emotional) **Group 2** initial: 49.5 (8.3) 6-month: 46 (12.9) **Group 3** initial: 45.7 (7.9) 6-month: 46.2 (13.3) **Group 4**	SF36 (emotional) **Group 1** initial: 43.1 (9.4) 6 month: 47.3 (8.7) P = NS from baseline	NR	NR	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
	initial: 43.3 (12.3) 6-month: 50.8 (7.1) **Group 5** initial: 47.5 (7) 6-month: 42.5 (10.5) All P = NS from baseline SF36 (physical) **Group 2** initial: 42.7 (13.8) 6-month: 50.5 (7.7) **Group 3** initial: 48.6 (5.3) 6-month: 47.8 (8.7) **Group 4** initial: 46.2 (7.8) 6-month: 48.9 (6.3) **Group 5** initial: 46.7 (8.7) 6-month: 48.8 (7.7) All P = NS from baseline	SF36 (physical) **Group 1** initial: 45.6 (8.6) 6 month: 47.5 (9) P = NS from baseline								

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Mulgrew 2007[39] CPAP titration (n = 35) APAP titration (n = 33)	SAQLI Median (IQR) Baseline: 3.5 (2.8, 4.1) 3 months: 5.8 (4.9, 6.3)	Baseline: 2.8 (2.1, 4.2) 3 months: 5.5 (4.8, 6.2) Difference at 3 months: -0.19 (95% CI -0.7, 0.3), P = .41	6% would have preferred lab CPAP All patients expressed overall satisfaction	62% would have preferred home manage-ment	NR	NR	NR	NR	NR	NR
Nolan 2007[51] APAP and CPAP (n = 29)	NR	NR	Preferred by 13/29 (45%)	Preferred by 13/29 (45%) 3/29 (10%) did not express a preference Observed order effect – preferred machine received for first leg of trial	NR	NR	NR	NR	NR	NR
Richard 2007 APAP (n = 96) CPAP (n = 78)	NR	NR	VAS 10 point scale 7.5 (2.3) (n = 95)	VAS 10 point scale 7.5 (1.9) (n = 76) P = .88	NR	NR	NR	NR	NR	NR
Nolan 2006 CPAP and 3APAPs (n = 27)[a]	SF-36 No significant differences between 3 APAP devices or between APAP devices and CPAP		14/27 (52%) preferred APAP 13/27 (48%) preferred CPAP Preferred RemStar Auto: 6/14 (43%) Preferred Autoset Spirit: 5/14 (36%) Preferred Breas PV 10i: 3/14 (21%)		NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Nussbaumer 2006[54] APAP and CPAP (n = 30)	SF-36 Physical Baseline[d] 82 (SE 4) At 1 month 84 (SE 4) Mental Baseline[d] 65 (SE 4) At 1 month 76 (SE 3)	SF-36 Physical At 1 month 85 (SE 4) Mental At 1 month 73 (SE 3) All P = NS vs baseline and between groups	Preferred APAP: 26/30 (87%)	Preferred CPAP: 4/30 (13%) P<.001	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
West 2006[62] Group 1, APAP (n = 31) Group 2, 1 wk titration CPAP (n = 33) Group 3, algorithm CPAP (n-34)	Data reported as median (5th/95th%) *SAQLI* Baseline 3.9 (1.7/6.0) P = .4 Change, 6 m 1.6 (-4.8/4.3) P = .7 P<.05 baseline *SF-36 MC* Pre CPAP 57.2 (19.8/87.5) P = .9 6 m: 79.3 (30.5/94.1) P = .9 P<.05 baseline *SF-36 PC* Pre CPAP 62.5 (17.2/93.2) P = .6 6 m: 78.8 (20/96.2) P = .5	Data reported as median (5th/95th%) *SAQLI* **Group 2:** Baseline 3.1 (1.5/5.8) Change, 6 m 1.5 (-5.6/4.7) **Group 3**: Baseline 3.5 (1.9/6.1) Change, 6 m 1.4 (-5.2/3.4) *SF-36 MC* **Group 2:** Pre CPAP 56.8 (26/89.4) 6 m: 81.5 (27.8/95) **Group 3:** Pre CPAP 56.6 (16.6/88.7) 6 m: 82.7 (35.4/95.4) *SF-36 PC* **Group 2:** Pre CPAP 65.7 (25.2/90) 6 m: 85.2 (26.6/95.3) **Group 3:** Pre CPAP 62.6 (25.9/92.5) 6 m: 83.3 (40.9/98.3)	NR	NR	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Hukins 2004[46] APAP and CPAP (n = 55)	SF-36, significant improvements in both treatment modes in the Role Physical and Vitality domains all P<.05), but no difference between groups; other domains P = NS		Subjective ease of CPAP use 7.15 (2.41) Attitude to CPAP 7.33 (2.05)	Ease of use 6.84 (2.54) P = .47 Attitude 9.91 (2.02) P = .20 Both used VAS 0-10	NR	NR	NR	NR	NR	NR
Hussain 2004[47] CPAP and APAP (n = 10)	NR	NR	Preferred by 10% of patients Patients reported similar satisfaction with therapy	Preferred by 60% of patients P = .06	NR	NR	NR	NR	NR	NR
Marrone 2004[48] APAP and CPAP (n = 22)	NR	NR	Preferred APAP: 14/22 (64%)	Preferred CPAP: 4/22 (18%) No preference: 4/22 (18%)	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Masa 2004[37] Standard titration (n = 107) Autoadjusted titration (n = 106)	SF 36 Physical Pre: 45.9 (8.6) Post: 47.3 (7.8) Change at 3 months: -1.4 (7.7) SF 36 Mental Pre: 47.5 (10.4) Post: 51.8 (9.2) Change at 3 months:-4.0 (10.8)	SF 36 Physica Pre: 44.3 (8.7) Post: 48.6 (7.3) Change at 3 months: -4.3 (6.9) P<.01 between groups SF 36 Mental Pre: 45.6 (12.2) Post: 49.4 (10.4) Change at 3 months: -3.9 (10.0) P = NS between groups	NR	NR	NR	NR	NR	NR	NR	NR
Noseda 2004[53] CPAP and APAP (n = 24)	NR	NR	Preferred by 16 patients	Preferred by 8 patients	NR	NR	NR	NR	NR	NR
Massie 2003[49] CPAP and APAP (n = 44)	SF-36 Vitality: 65 (20) SF Mental health: 80 (14) P<.05	SF-36 Vitality: 58 (23) P<.05 SF Mental Health: 75 (18) P > .07 for all other domains	NR	NR	NR	NR	NR	NR	NR	NR
Planès 2003[56] Auto (n = 16) Conventional (n = 14)	NR	NR	NR	NR	NR	NR	NR	NR	Tolerance score: 22.9 (5.8)	Tolerance score: 18.8 (10.5) P = NS

Study Intervention (n) Control (n)	Quality of Lfe		Patient Satisfaction		Remission		Cognitive Symptoms		Other (describe)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Senn 2003[59] Auto Adjust and AutoSet and Fixed (n = 29)	SF-36 health transition, vitality, social functioning, and mental component summary scores were significantly improved by all treatments, no significant between group differences SF-36 vitality reached clinically relevant treatment effect (change of at least 10 points) for all treatments Effect sizes AutoSet: 0.63 AutoAdjust: 0.65 Fixed: 0.78		Treatment preference 21/29 (72%) no preference 4/29 (14%) preferred an auto mode 4/29 (14%) preferred a fixed mode 17/29 (59%) preferred one auto device brand 11/29 (38%) preferred the other brand 1/29 (3%) had no preference		NR	NR	NR	NR	NR	NR
Randerath 2001[57] APAP and CPAP (n = 47 completed)	NR	NR	Preferred by 35/47 (74%)	Preferred by 12/47 (26%) P<.01	NR	NR	NR	NR	NR	NR
D'Ortho 2000[42] APAP and CPAP (n = 25)	NR	NR	Preferred mode: 15/25 (60%)	Preferred mode: 8/25 (32%) (2/25 [8%] unable to tolerate either)	NR	NR	NR	NR	NR	NR

[a]APAP: a) RemStar Auto, b) Autoset Spirit, c) Breas Pv 10i

NR = not reported; NS = not statistically significant; PCS = physical component summary; MCS = mental component summary; SAQLI = Sleep Apnea Quality of Life Index; SEM = standard error of the mean; VAS = visual analog scale

Table 10. Intermediate Outcomes for KQ3

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Bakker 2011[40] CPAP and APAP (n = 12)	On-treatment (by machine at home): 13.2 (10.2) On-treatment (during PSG): 9.8/hr (9.5)	On-treatment (by machine at home): 8.0 (6.4) P = .06 On-treatment (during PSG): 7.3/hr (6.6) P = .35	Mean SpO2 94.8 (2.1) ODI 4% 6.8/hr(7.9) ODI3% 16.1/hr (16.6) Time <90% SpO2 1.5% (2.6)	Mean SpO2 95.5% (1.4) P = .03 ODI 4% 5.1/hr (5.1) P = .21 ODI 3% 11.4/hr (10.8) P = .15 Time <90% SpO2 1.2% (2.2) P = .50	ESS Baseline: 17.4 (4.7) post-APAP: 10.8 (5.7)	ESS Baseline: 17.4 (4.7) post-CPAP: 10.1 (6.1) P = .12	Total sleep time, min 382 (53.4)	Total sleep time, min 393.1 (44.9) P = .74	NR	NR
Lettieri 2011[33] Group 2: PSG+lab CPAP titration (n = 70) Group 3: PSG+APAP titration (n = 70)	NR	NR	NR	NR	ESS Baseline: 13.9 (4.4) Follow-up: 8.9 (2.1) Change: 36%	ESS Baseline: 14.1 (4.2) Follow-up: 8.4 (2.3) Change: 39.8%	NR	NR	NR	NR
Drummond 2010[43] APAP (n = 54) Usual care (n = 55)	NR	NR	NR	NR	ESS Baseline 14.8 (4.9) 1 month 11.6 (5.4) P = NS from baseline	ESS Baseline 14.1 (5.0) 1 month 12.7 (5.0) P = .25	FOSQ Baseline 14.0 (3.6) 1 month 15.5 (3.0)	FOSQ Baseline 14.2 (3.3) 1 month 14.6 (3.8) P = .17	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
McArdle 2010[38] Manual CPAP titration (n = 83) Home APAP titration (n = 86) -all outcomes per protocol NOT ITT unless specified	Baseline: 38.0 4 weeks: 8.0	Baseline: 38.0 P = NS 4 weeks: 7.1 P = NS	SaO_2 <90%, time, min Baseline: 2 4 weeks: 0 Avg SaO_2 4 weeks: 96% (2.0)	Baseline: 5 4 weeks: 0 P = NS 95.8% (2.0) P = NS	ESS Baseline: 13.8 (4.4) (n = 61) 4 weeks: 8.3 (4.5) (n = 62) Change: -5.5 (5.2) (n = 62) ITT ESS Baseline: 14.0 (4.2) (n = 70) 4 weeks: 8.5 (4.4) (n = 69) Change: -5.6 (5.0) (n = 69)	ESS Baseline 14.4 (4.0) (n = 62) 4 weeks: 8.7 (5.1) n = 61 P = NS Change: -5.7 (5.3) n = 61 P = NS ITT ESS Baseline: 14.3 (4.0) (n = 71) 4 weeks: 8.6 (5.1) (n = 70) P = NS Change: -5.7 (5.6) (n = 70) P = NS	Arousal Index, events/h 4 weeks: 22 (9) TST, min 4 weeks: 364 (71)	Arousal Index, events/h 4 weeks: 23 (12) P = NS TST, min 4 weeks: 351 (79) P = NS	NR	NR
Vennelle 2010[61] APAP and CPAP (n = 192, 181 analyzed)	Residual A+H/h 6.7 (SEM 0.4) (NOTE: only 70/181 had baseline A+H/h measure with mean of 49 [20])	Residual A+H/h 6.3 (SEM 0.4) P = .17	NR	NR	ESS Baseline: 14 (3) (overall) At 6 weeks: 9.5 (SEM 0.4)	ESS At 6 weeks: 10.0 (SEM 0.3) P = .031	NR	NR	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Damjanovic, 2009[41] Standard APAP (n = 25) Standard CPAP (n = 25) Intensive APAP (n = 25) Intensive CPAP (n = 25)	3 months: 4.8 (0.7) 9 months: 3.6 (0.8)	3 months: 6.7 (0.9) 9 months: 5.4 (1.4) P = NS	ODI Baseline: 35.6 (3.9) 3 months: 2.1 (0.3) 9 months: 2.9 (0.7)	ODI Baseline: 41.1 (3.8) 3 months: 4.1 (0.7) 9 months: 4.8 (1.3) P = NS	ESS 3 months: 6.4 (0.7) 9 months: 5.9 (0.7)	ESS 3 months: 7 (0.7) 9 months: 6.6 (0.7) P = NS	ARI Baseline: 30.6 (3.3) 3 months: 12.3 (1.3) 9 months: 12.9 (1.5)	ARI Baseline: 34.5 (3.1) 3 months: 16.4 (1.4) 9 months: 13.2 (1.5) P = NS	NR	NR
Galetke 2008[45] APAP and CPAP (n = 20)	Baseline 32.9 (19.1) (combined group) After 8 weeks: 5.6 (3.6)	After 8 weeks: 4.6 (2.9) P = NS	SaO_2 min, % Baseline 77.8 (8.4) (combined group) After 8 weeks: 86.5 (5.2)	SaO_2 min, % After 8 weeks: 88.3 (3.6) P = NS	ESS Baseline 10.3 (5.7) (combined group) After 8 weeks: 4.9 (4.6)	ESS After 8 weeks: 6.6 (4.8) P = NS	Arousals/h Baseline: 17.6 (9.2 (combined) After 8 weeks: 13.6 (8.6) Snoring, n of epochs Baseline: 436.3 (209.6) After 8 weeks: 54.9 (108.5)	Arousals/h After 8 weeks: 12.6 (7.3) Snoring, n of epochs After 8 weeks: 78.8 (88.3) P = NS	NR	NR
Fietze 2007[44] APAP n = 10 CPAP n = 11	Baseline: 43.3 (30.2) At 6 weeks: 4.4 (3.4)/hr P = NS	Baseline: 40.4 (26.1) At 6 weeks: 3.9 (4.3)/hr P<.05 form baseline	NR	NR	ESS baseline 12.9 (5.6) 6 weeks: 6.5 (4.3) P<.01 Did not differ at any point in time between the CPAP and APAP groups		NR	NR	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Meurice 2007[50] At 6 months Group 1, n = 14 Group 2, n = 13 Group 3, n = 15 Group 4, n = 12 Group 5, n = 11	**Group 2** Baseline: 49.9 (16.5) 6 m: 3.7 (3.9) **Group 3** Baseline: 53.4 (15.1) 6 m: 2.3 (2.9) **Group 4** Baseline: 48.1 (18.7) 6 m: 8.6 (10) **Group 5** Baseline: 54.5 (17.7) 6 m: 8.5 (9.7)	**Group 1** Baseline: 56.1 (21.4) 6 m: 2.4 (3.4)	*Mean SaO_2* **Group 2** Baseline: 92.5% (2.3) 6 m: 95% (1.5) **Group 3** Baseline: 91.8% (2) 6 m: 94.2% (1.5) **Group 4** Baseline: 92.6% (3.8) 6 m: 94.6% (2) **Group 5** Baseline: 91.9% (2.8) 6 m: 94.3% (1.8) *SaO_2<90%, min* **Group 2** Baseline: 16.2% (16.4) 6 m: 0.3% (0.6) **Group 3** Baseline: 23.3% (17.6) 6 m: 0.3% (0.6) **Group 4** Baseline: 11.7% (15.1) 6 m: 3% (5.3) **Group 5** Baseline: 16.7% (18.8) 6 m: 1.1% (2)	Mean SaO_2 **Group 1** Baseline: 90.8% (6.9) 6 m: 94% (1.8) P = NS SaO_2 <90%, min **Group 1** Baseline: 19.8% (28.7) 6 m: 2.2% (7.7) P = NS	ESS **Group 2** Baseline: 11.2 (5.6) 6 m: 6.5 (4.1) **Group 3** Baseline: 12.9 (4.3) 6 m: 5.2 (4.1) **Group 4** Baseline: 11.3 (3.8) 6 m: 7.2 (4) **Group 5** Baseline: 10 (6.2) 6 m: 7.5 (5.7)	ESS **Group 1** Baseline: 10.6 (5.2) 6 m: 5.9 (5.1) P = NS	TST, min **Group 2** Baseline: 400.6 (74.4) 6 m: 382.7 (94.7) **Group 3** Baseline: 390.1 (65.1) 6 m: 370.5 (65.2) **Group 4** Baseline: 372.5 (87.8) 6 m: 377.4 (65.9) **Group 5** Baseline: 371.7 (96.1) 6 m: 356.1 (43.9)	TST, min **Group 1** Baseline: 373.8 (91.8) 6 m: 376.6 (50.9)	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Mulgrew 2007[39] CPAP titration (n = 35) APAP titration (n = 33)	AHI Median (IQR) 3 m: 2.5/hr (0.9, 10.1)	AHI 3 m: 3.2/hr (1.7, 8.4) Difference at 3 m: 0.8 (95% CI -0.9, 2.3) P = .31	NR	NR	ESS Median (IQR) 3 m: 5.0 (3.0, 9.0)	ESS 3 m: 5.0 (2.0, 8.0) Difference at 3 m: 0.0 (95% CI -2.0, 2.0) P = .86	NR	NR	NR	NR
Nolan 2007[51] APAP and CPAP (n = 29)	Baseline: 14.7 (8) (combined) At 8 weeks: 2.7 (2.1) P = .15	At 8 weeks: 3.5 (2.5)	Mean SaO_2 Baseline: 92% (2.1) At 8 weeks: 93.2% (1.8) P = .44	Mean SaO_2 At 8 weeks: 93.3% (1.7)	ESS Score Baseline 12.3 (4) (combined) At 8 weeks: 8.6 (4.0) Total sleep time, min Baseline: 343 (48) (combined) At 8 weeks: 335 (43)	ESS Score At 8 weeks: 7.7 (4.6) P = .35 Total sleep time, min At 8 weeks: 349 (55) P = .09	Total snore events Baseline: 313 (259)/h (combined) At 8 weeks: 16 (11) P = .72 Respiratory arousals Baseline: 16 (14) (combined) At 8 weeks: 2 (3) P = .03	Total snore events At 8 weeks: 17 (16) Respiratory arousals At 8 weeks: 5 (4)	Body weight (88.1 (13.3)kg) did not change during the course of the study	
Patruno 2007 APAP (n = 15) CPAP (n = 16)	AHI/h 6 (2.3) P<.001	AHI/h 2 (1.6) Significantly reduced from baseline in both groups	ODI/h 4.8 (2.1) P<.001 SaO_2, mean 95.7% (17.4) SaO_2, nadir 88.1% (1.6)	ODI/h 1.1 (1.3) Significantly reduced in both groups SaO_2, mean 96.3% (0.8) SaO_2, nadir 90.8% (1.3) P = NS	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Nolan 2006 CPAP and 3 APAPs (n = 27)[a]	NR	NR	NR	NR	No further significant change in ESS after treatment with any APAP device	Fixed pressure CPAP reduced ESS from baseline of 15 (3-110) to 5 (3-11) P = .002	NR	NR	NR	NR
Nussbaumer 2006[54] APAP and CPAP (n = 30)	Baseline 41.1 (SE 3.6) At 1 month 4.6 (0.7)	At 1 month 5.4 (1.2) P = NS	ODI Baseline[b] 29 (SE 4) At 1 month 4.2 (0.7)	ODI At 1 month 4.1 (0.7) P = NS	ESS Baseline 12.7 (SE 0.6) At 1 month 6.6 (SE 0.6)	ESS At 1 month 6.6 (SE 0.6) P = NS	NR	NR	NR	NR
West 2006[62] Group 1, APAP (n = 31) Group 2, 1 wk titration CPAP (n = 33) Group 3, algorithm CPAP (n-34)	All data reported as median (5th/95th centile) 6 months 5.2 (1.5/13.2) P = .3	All data reported as median (5th/95th centile) 6 months **Group 2:** 3.6 (0.5/15.9) **Group 3:** 3.8 (0.7/26.1)	NR	NR	All data reported as median (5th/95th centile) ESS Pre CPAP 16.0 (10.6/23.0) P = .7 6 m: 6.0 (0.45/13.8)	All data reported as median (5th/95th centile) ESS **Group 2:** Pre CPAP 17.0 (10.4/22.6) 6 m: 5.0 (0/15.5) **Group 3:** Pre CPAP 16.5 (10.5/22.3) 6 m: 5.0 (0.5/12.5) P = .8	All data reported as median (5th/95th centile) MWT (mins) Pre CPAP 19.4 (1.4/40) P = .8 6 m: 40 (11.6/40) P = .2	All data reported as median (5th/95th centile) MWT (mins) **Group 2:** Pre CPAP 19.5 (2.9/40) 6 m: 40 (14.5/40) **Group 3:** Pre CPAP 15.7 (2.1/40) 6 m: 40 (2.2/40)	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Hukins 2004[46] APAP and CPAP (n = 55)	NR	NR	NR	NR	ESS Both groups improved from baseline (P<.001) P = NS		NR	NR	NR	NR
Hussain 2004[47] CPAP and APAP (n = 10)	Baseline: 47.2 (35.6) Follow-up: 13.1 (8.3)	Baseline: 47.2 (35.6) Follow-up: 9.6 (5.4) P = NS	Desaturation index Baseline: 53 (36) Follow-up: 15 (14) Basal O_2 Saturation Baseline: 91.3 (4.5) Follow-up: 94.6 (1)	Desaturation index Baseline: 53 (36) Follow-up: 10 (13) P = NS Basal O_2 Saturation Baseline: 91.3 (4.5) Follow-up: 95.3 (1.6) P = NS Minimum oxygen saturation (P<.05)	ESS Baseline: 11.1 (6.4) Follow-up: 8 (5.7)	ESS Baseline: 11.1 (6.4) Follow-up: 6.6 (5.9) P = NS	Arousal Index Baseline: 17.3 (17.7) Follow-up: 5.9 (6.5) Total sleep time, min Baseline: 381 (92) Follow-up: 346 (87)	Arousal Index Baseline: 17.3 (17.7) Follow-up: 4.9 (3.7) P = NS Total sleep time, min Baseline: 381 (92) Follow-up: 360 (108) P = NS	NR	NR
Marrone 2004[48] APAP and CPAP (n = 22)	NR	NR	NR	NR	ESS Baseline 16.3 (5) 1 month 3.9 (2.8)	ESS Baseline 16.3 (5) 1 month 4.9 (3.7) P = NS	NR	NR	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Masa 2004[37] Standard titration (n = 107) Autoadjusted titration (n = 106)	Pre-treatment: 62.8 (22.8) Post: 4.9 (7.6) Change at 3 months; 57.9 (22.6)	Pre: 61.8 (22.0) Post: 5.1 (6.8) Change at 3 months: 56.6 (21.0) P = NS	SaO_2 <90% of TST Pre: 29.9 (27.3) Post: 1.4 (4.1) Change at 3 months: 28.2 (26.1)	SaO_2 <90% of TST Pre: 25.3 (25.0) Post: 3.0 (13.9) Change at 3 months: 22.0 (28.1) P = NS	*ESS* Pre: 15.2 (3.5) Post: 7.2 (4.4) Change at 3 months: 8.1 (5.4) P = NS *FOSQ* Pre: 94.4 (1.07) Post: 108.0 14.3) Change - 14.2 (17.2)	*ESS* Pre: 15.9 (3.5) Post: 7.9 (4.6) Change at 3 months: 8.0 (4.8) P = NS for change between groups *FOSQ* Pre: 84.4 (22.8) Post: 105.1 (16.0) Change - 20.8 (20.1) P = NS	Arousal Index Pre: 55.5 (19.3) Post: 12.0 (8.5) Change at 3 months: 8.1 (5.4)	Arousal Index Pre: 55.2 (18..0) Post: 12.3 (10.0) Change at 3 months: 8.0 (4.8) P = NS	NR	NR
Noseda 2004[53] CPAP and APAP (n = 24)	NR	NR	NR	NR	ESS Baseline: 10.7 (2.4) 8 w: 5.1 (2.8) Sleep latency 12 min (12) Self-estimated effective sleep 6.1 (1.3)	ESS Baseline: 10.7 (2.4) 8 w: 6.1 (2.8) P<.01 Sleep latency 14 (12) P = NS Self-estimated effective sleep 6.2h (1.3) P = NS	AI Baseline: Mean 24.6 (22.6) On APAP: Median 0.45/h	AI Baseline: Mean 24.6 (22.6) On APAP: Median 0.4/h P = NS	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Massie 2003[49] CPAP and APAP (n = 44)	Residual AHI 9.6 (5.3)	Residual AHI 10.7 (6.6) P = NS	NR	NR	ESS 8 (4)	ESS 9 (4) P = NS	P<.006 more restful sleep, overall better sleep quality, less discomfort from pressure, and less trouble getting to sleep	NR	NR	NR
Planès 2003[56] Auto (n = 16) Conventional (n = 14)	Events/h Baseline: 57.5 (16.5) 2 months: 7.6 (6.9)	Events/h Baseline: 61.0 (17.4) 2 months: 10.4 (12.5) P = NS	SaO_2<90% (time spent) Baseline: 24.9 (21.6) 2 months: 0.3 (0.6)	SaO_2<90% (time spent) Baseline: 12.7 (12.8) 2 months: 1.9 (5.0) P = NS	ESS score Baseline: 15.5 (4.7) 2 months: 7.5 (3.4) P<.0001 from baseline	ESS score Baseline: 14.7 (3.9) 2 months: 7.6 (3.4) P = NS	NR	NR	NR	NR
Senn 2003[59] Auto Adjust and AutoSet and Fixed (n = 29)	Mean over treatment period AutoSet 7.8 (0.9) AutoAdjust 6.6 (1.3)	7.4 (1.3) P = NS	Time with SaO_2<90%, % time in bed AutoSet 0.9 (0.7) AutoAdjust 2.7 (1.9)	Time with SaO_2<90%, % time in bed 1.1 (0.7) P = NS	ESS score AutoSet" 9.0 (0.6) AutoAdjust 8.0 (0.8)	ESS score 8.2 (0.7) P = NS	"Overall benefit from CPAP therapy" 5 pt Likert scale AutoSet 4.3 (0.1) AutoAdjust 4.1 (0.2)	"Overall benefit from CPAP therapy" 4.3 (0.2) P = NS	NR	NR

Study Intervention (n) Control (n)	Apnea-Hypopnea Index (AHI)		Oxygen Saturation		Sleep Symptom Scores		Other Sleep or Urinary Symptom Scores		Weight Loss	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Randerath 2001[57] APAP and CPAP (n = 52, 47 completed)	Baseline: 35.1 (26) combined At 6 weeks: 5.0 (5.2)	At 6 weeks: 4.3 (6.3) P<.001	NR	NR	ESS Baseline: 11.1 (5.1) At 6 weeks: 7.8 (4.7) Total sleep time Baseline: 319 (55) (combined) At 6 weeks 324 (52)	ESS At 6 weeks: 8.8 (4.6) Total sleep time At 6 weeks: 330 (43)	Snoring Baseline: 49 (36)/h (combined) At 6 weeks: 13 (20)/h Total number of arousals Baseline: 34.0 (21.7)/h At 6 weeks: 10.9 (5.7)	Snoring At 6 weeks: 6 (13) P<.001 Total number of arousals At 6 weeks: 12.6 (8.3) P<.001	NR	NR
D'Ortho 2000[42] APAP and CPAP (n = 25)	Baseline: 57.8 (5.8) (combined) After 2 months: 10.6 (9.3)	After 2 months: 9.7 (1.9)	Mean SaO_2, % Baseline: 93.0 (3.0) (combined) After 2 months: 95.6 (1.6)	Mean SaO_2, % After 2 months: 95.9 (1.5)	ESS Baseline: 12.7 (5.3 (combined) After 2 months: 9.3 (4.8)	ESS After 2 months: 9.2 (5.5) P = NS	NR	NR	NR	NR
Teschler 2000[60] CPAP and APAP (n = 10)	Baseline: 52.9 (8.1) At home: 4.0 (0.3)	At home: 3.7 (0.3) P = NS, no order effect, no tx by order interaction	NR	NR	NR	NR	NR	NR	NR	NR

[a]APAP: a) RemStar Auto, b) Autoset Spirit, c) Breas Pv 10i; [b]Data from Visual Analog Scale (0-100) with lower values "better"
ESS = Epworth Sleepiness Scale (non-inferiority margin was -2.0); FOSQ = Functional Outcomes of Sleep Questionnaire; ODI = oxygen desaturation index; MD = mean difference; SASQ = Sleep Apnea Symptoms Questionnaire, TST = Total sleep time, Ar/AwI = arousals and awakening index, ARI = arousal index; SaO_2 = oxygen saturation; MWT = maintenance of wakefulness test; NS = not statistically significant; NR = not reported

Table 11. Intermediate Outcomes for KQ3, Continued

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Harms (False Positives/Negatives)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
McArdle 2010[38] Manual CPAP titration (n = 83) Home APAP titration (n = 86) -all outcomes per protocol NOT ITT unless specified	NR	NR	SBP Baseline: 128.4 (14.9) 4 weeks: 126.5 (15.4) DBP Baseline: 81.5 (10.1) 4 weeks: 77.0 (10.3)	SBP Baseline: 125.2 (17.3) 4 weeks: 122.4 (17.1) ES: 0.25 (-0.05, 0.56) P = NS DBP Baseline: 79.1 (9.9) 4 weeks: 76.1 (8.6) ES: 0.09 (-0.2, 0.4) P = NS	NR	NR	NR	NR	NR	NR
Damjanovic, 2009[41] Standard APAP (n = 25) Standard CPAP (n = 25) Intensive APAP (n = 25) Intensive CPAP (n = 25)	BMI did not significantly change in the course of the study		NR	NR	NR	NR	NR	NR	NR	NR
Nolan 2007[51] APAP and CPAP (n = 29)	NR	NR	No significant change in blood pressure with either APAP or CPAP during the course of the study		NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Harms (False Positives/Negatives)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Patruno 2007 APAP (n = 15) CPAP (n = 16)	"not significantly affected by treatments"		SBP Baseline: 142 (12) 3 m: 136 (6) P = NS, change from baseline DBP Baseline: 87.5 (4) 3 m: 86 (4) P = NS, change from baseline	SBP Baseline: 144 (10) 3 m: 132 (8) P<.001, change from baseline DBP Baseline: 88 (4) 3 m: 79 (6) P<.001, change from baseline	NR	NR	NR	NR	NR	NR
West 2006[62] Group 1, APAP (n = 31) Group 2, 1 wk titration CPAP (n = 33) Group 3, algorithm CPAP (n-34)	NR	NR	All data reported as median (5th/95th centile) Mean BP Pre CPAP 95.8 (77/122) P = .9 6 m: 99.6 (77.3/119) P = .5	All data reported as median (5th/95th centile) Mean BP **Group 2:** Pre CPAP 95.2 (77.3/118.3) 6 m: 96.7 (82.7/119) **Group 3:** Pre CPAP 96.2 (75.0/120.6) 6 m: 96.4 (73.3/114.3)	NR	NR	NR	NR	NR	NR

Study Intervention (n) Control (n)	BMI		Blood Pressure		HbA1c		Time to Initiation of Therapy		Harms (False Positives/Negatives)	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Planès 2003[56] Auto (n = 16) Conventional (n = 14)	"in neither group did BMI change significantly during the study"		NR	NR	NR	NR	11.8 (15.5) days P<.01	47.2 (46.5) days	NR	NR

NR = not reported; NS = not statistically significant; BP = blood pressure; SBP = systolic blood pressure; DBP = diastolic blood pressure

Table 12. Intermediate Outcomes for KQ3, Continued

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Bakker 2011[40] CPAP and APAP (n = 12)	NR	NR	NR	NR	NR	NR	NR	NR	6.3 (1.8) hrs/night	5.8 (2.8) hrs/night (P = .11)
Lettieri 2011[33] Group 2: PSG+lab CPAP titration (n = 70) Group 3: PSG+APAP titration (n = 70)	NR	NR	10% dis-continued therapy	8.6% dis-continued therapy P = NS between groups	NR	NR	Diagnostic PSG cost: $704.28 CPAP titration cost: $753.76 (Medicare reimbursement rates)		% nights used 72.4 (22) hrs/night, nights used 4.8 (1.7) Use of PAP > 4h/ night for > 70% of nights: 50%	% nights used 73.2 (18) ES: -0.04 (-0.4, 0.3) hrs/night, nights used 4.7 (1.1) ES: 0.07 (-0.2, 0.4) Use of PAP > 4h/ night for > 70% of nights 51.4%

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
McArdle 2010[38] Manual CPAP titration (n = 83) Home APAP titration (n = 86) - all outcomes per protocol NOT ITT unless specified	NR	NR	NR	NR	NR	NR	Staff/pt A$70.74 Equipment etc./pt A$61.35 Direct costs/pt A$132.09 Travel/pt A$26.91	Staff/pt A$250.95 Equipment etc./pt A$93.19 Direct costs/pt A$817.84 Travel/pt A$15.04	% patients continuing CPAP use at 4 weeks 85% (n = 63) ITT: % using CPAP at 4 weeks 81% (n = 70) CPAP use (hrs) at 4 weeks: 4.39 (2.2) (n = 61) ITT: CPAP use, hrs, at 4 weeks 4.24 (2.2) (n = 68)	% patients continuing CPAP use at 4 weeks 87% (n = 62) P = NS ITT: 86% (n = 71) P = NS CPAP use (hrs) at 4 weeks: 4.36 (2.2) (n = 63) ES: 0.014 (-0.34, 0.37) P = NS ITT 4.38 (2.2) (n = 70) ES:-0.06 (-0.4, 0.27) P = NS
Vennelle 2010[61] APAP and CPAP (n = 192, 181 analyzed)	NR	NR	NR	NR	NR	NR	NR	NR	Mean CPAP use 4.2 (SEM 0.2)h/night	4.0 (SEM 0.2)h/night P = .047

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Damjanovic 2009[41] Standard APAP (n = 25) Standard CPAP (n = 25) Intensive APAP (n = 25) Intensive CPAP (n = 25)	NR	NR	NR	NR	NR	NR	NR	NR	Daily usage (h) 3 m: 5.4 (0.2) 9 m: 5.2 (0.4) Percent of days 3 m: 76% (3.9) 9 m: 67.9% (5) Hours used/sleep time 3 m: 73.4 (3.1) 9 m: 72.5 (5)	Daily usage (h) 3 m: 5.4 (0.3) 9 m: 5.1 (0.3) Percent of days 3 m: 75% (4.1) 9 m: 69.2% (4.9) Hours used/sleep time 3 m: 81.4 (5.8) 9 m: 72.1 (5.2) No difference between groups in adherence
Galetke 2008[45] APAP and CPAP (n = 20)	NR	NR	NR	NR	NR	NR	NR	NR	382 (107) min/night	383 (116) min/night P = NS
Fietze 2007[44] APAP n = 10 CPAP n = 11	NR	NR	NR	NR	NR	NR	NR	NR	Overall use: 77% (25%) of nights Nocturnal usage: APAP: 5.0 (1.6)h CPAP: 4.2 (2.2)h No significant differences in the course of compliance between the 2 patient groups	

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Meurice 2007[50] At 6 months Group 1, n = 14 Group 2, n = 13 Group 3, n = 15 Group 4, n = 12 Group 5, n = 11	NR	NR	NR	NR	NR	NR	NR	NR	CPAP use, h/night **Group 2** 6 m: 5.5 (1.4) **Group 3** 6 m: 6.1 (1.6) **Group 4** 6 m: 5.1 (1.6) **Group 5** 6 m: 7.0 (1.9)	CPAP use **Group 1:** 6 m: 6.5 (1.8) P = NS
Mulgrew 2007[39] CPAP titration (n = 35) APAP titration (n = 33)	NR	NR	NR	NR	NR	NR	NR	NR	CPAP adherence (h/night) Median (IQR) 3 months: 6.0 (5.1, 7.1)	CPAP adherence 3 months: 5.4 (3.7, 6.4) Difference at 3 months: -1.12 (95% CI -2.0, 0.2) P = .02
Nolan 2007[51] APAP and CPAP (n = 29)	NR	NR	All patients experienced some side effects on each treatment, there was no significant difference between APAP and CPAP in terms of side effects (dry mouth, blocked/runny nose, pressure felt too high, claustrophobic)		NR	NR	NR	NR	Nights used 79% (29) Mean hrs used per night used 4.9 (2.1)	Nights used 81% (25) P = .87 4.9 (1.9) P = .94
Patruno 2007 APAP (n = 15) CPAP (n = 16)	NR	NR	NR	NR	NR	NR	NR	NR	6.2 (0.8) h/day P = NS	6.0 (1.0) h/day

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Richard 2007 APAP (n = 96) CPAP (n = 78)	NR	NR	NR	NR	NR	NR	NR	NR	Nights/wk[b] 6.3 (1.4) (n = 96) Hrs/night[b] 6.3 (1.8) (n = 95) Used ≥ 4h/night, ≥ 5d/wk: (74/96) 77.1%	Nights/wk 6.4 (1.4) (n = 76) P = .57 Hours/night 6.5 (1.5) (n = 75) P = .64 Used ≥ 4h/night, ≥ 5d/wk: (64/78) 82.1%
Nolan 2006 CPAP and 3APAPs (n = 27)[a]	NR	NR	Nasal symptoms: greater problem for c); P<.05 vs a) Throat/mouth symptoms: greater problem for c); P<.05 vs a) Pressure discomfort: greater problem for c); P<.05 vs a) and b)		NR	NR	NR	NR	Nights used (%) **a)** 100 (79-100) P = NS vs CPAP **b)** 96 (42-100) P = NS vs CPAP **c)** 59 (17-83) P<.01 vs CPAP, a, and b Hrs/night **a)** 7.1 (5.3-8.1) P = NS vs CPAP **b)** 6.8 (5.9-8.0) P = NS vs CPAP **c)** 5.0 (3.8-5.6) P<.01 vs CPAP, a, and b	Nights used (%) 100 (94-100) Hrs/night 6.6 (5.9-7.9)

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Nussbaumer 2006[54] APAP and CPAP (n = 30)	NR	NR	No side effects requiring interruption of therapy or consultations		Nasal stuff-iness[d] 24 (SE 6) Sore/dry mouth/ throat 27 (SE 5) Discom-fort with air pressure 8 (SE 2)	Nasal stuffi-ness 24 (SE 6) P = NS Sore/dry mouth/ throat 34 (SE 6) P = NS Discom-fort with air pressure 27 (SE 5) P<.05	NR	NR	% of days with > 4 hours use 72% (SE 4) Hrs/night 5.1 (SE 0.3)	% of days with > 4 hours use 68% (SE 5) P = NS Hrs/night 4.8 (SE 0.3) P = NS
West 2006[62] Group 1, APAP (n = 31) Group 2, 1 wk titration CPAP (n = 33) Group 3, algorithm CPAP (n-34)	NR	NR	NR	NR	NR	NR	NR	NR	All data reported as median (5th/95th centile) Hrs used/night 6 m: 5.49 (0/7.5) P = .23 Nights used (%) 6 months 100 (5/100) P = .21	All data reported as median (5th/95th centile) Hrs used/night 6 months **Group 2:** 4.9 (0/7.2) **Group 3:** 4.0 (0/8.3) Nights used (%) 6 months **Group 2:** 98.3 (61/100) **Group 3:** 92.6 (33/100)

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Hukins 2004[46] APAP and CPAP (n = 55)	NR	NR	Nasal irritation or obstruction5 Pressure intolerance2 Partner dislike 0 Total number of side effects15	Nasal irritation or obstruction 10 P = .27 Pressure intolerance 5 P = .44 Partner dislike 1 P = .99 Total number of side effects 28 P = .02	NR	NR	NR	NR	Avg. nightly use 5.05 (2.38) hours per night P = .14 Percentage of nights treatment used 83.3% (23.3%)	Avg. nightly use 4.86 (2.65) hours per night Percentage of nights treatment used 78% (32.6%) P = .29
Hussain 2004[47] CPAP and APAP (n = 10)	NR	NR	NR	NR	NR	NR	NR	NR	H/night 4.3 (1.9)	H/night 3.7 (2.6) P = NS
Marrone, 2004[48] APAP and CPAP (n = 22)	NR	NR	NR	NR	NR	NR	NR	NR	Hours/day 4.9 (1.7) Days of machine use 88.8% (15.2%)	Hours/day 4.4 (1.9) P = NS Days of machine use 83.9% (18.6%) P = NS
Masa 2004[37] Standard titration (n = 107) Autoadjusted titration (n = 106)	NR	NR	"no important differences" between standard and autoadjusted titration; tendency for more side effects (*eg*, rhinitis, mask intolerance, aerophagia, headache, smothering sensation, bed partner intolerance) in autoadjusted group		NR	NR	NR	NR	Use hr/day 5.3 (1.9)	Use hr/day 5.2 (2.0) ES: 0.05 (-0.2, 0.32) P = NR

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Noseda 2004[53] CPAP and APAP (n = 24)	NR	NR	NR	NR	NR	NR	NR	NR	Median percentage of nights 96.5% Mean use per effective night, h 5.3 (1.9) P = NS	Median percentage of nights 95.5% P = NS Mean use per effective night, h 5.5 (1.5)
Massie 2003[49] CPAP and APAP (n = 44)	NR	NR	NR	NR	NR	NR	NR	NR	% of nights used 92% (11) Minutes used/24hrs 306 (114) P<.005	% of nights used: 88% (15) P = NS Minutes used/24hrs 271 (115)
Planès 2003[56] Auto (n = 16) Conventional (n = 14)	NR	NR	NR	NR	NR	NR	Hospital care: €602 P<.001 between groups Tele-communica-tion: €155 Total cost: €1264 P<.01	Hospital care: €1220 Tele-communica-tion: €9 P<.001 between groups Total cost: €1720	Compliance (defined as 3hrs/night) 13/16 (81%) Mean duration 4.5h (1.7)	Compliance (defined as 3hrs/night) 14/14 (100%) Mean duration 5.3h (1.4) P = NS between groups

Study Intervention (n) Control (n)	Harms (Overdiagnosis)		Harms, Adverse Events (describe)		Harms, Adverse Events (describe)		Costs per Patient, US dollars (unless otherwise noted)		Compliance/Adherence	
	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP	APAP	CPAP
Senn 2003[59] Auto Adjust and AutoSet and Fixed (n = 29)	NR	NR	Dry mouth AutoSet 8/29 (28%) AutoAdjust 7/29 (24%) Skin irritation AutoSet 9/29 (31%) AutoAdjust 8/29 (28%) Nasal irritation AutoSet 5/29 (17%) AutoAdjust 8/29 (28%)	Dry mouth 3/29 (10%) Skin irritation 10/29 (34%) Nasal irritation 8/29 (28%) All P = NS all “mild”	NR	NR	NR	NR	Mean h/night AutoSet 5.5 (0.2) Auto Adjust 5.5 (0.2) Nights with > 2.5h, % AutoSet 83% (3) Auto Adjust 79% (4)	Mean h/night 5.6 (0.2) Nights with > 2.5h, % 82% (3) P<.01 for all compared to baseline, P = NS
Randerath 2001[57] APAP and CPAP (n = 47 completed)	NR	NR	Side effects were mild under both modes, and no significant differences were observable		NR	NR	NR	NR	Usage: 98.4% of days (APAP and CPAP) Minutes/ day APAP: 315.4 (94.7) CPAP: 315.4 (97.4)	
D’Ortho 2000[42] APAP and CPAP (n = 25)	NR	NR	NR	NR	NR	NR	NR	NR	Hours of use per night 4.1 (1.8) CPAP use ≥ 4h/night 18/25 (72%)	Hours of use per night 4.7 (1.8) P = .20 CPAP use ≥ 4h/night 19/25 (76%)

[a]APAP: a) RemStar Auto, b) Autoset Spirit, c) Breas Pv 10i
[b]Excludes failures
ES = effect size; ITT = intent to treat (analysis); NS = not statistically significant; NR = not reported; PSG = polysomnography; SE = standard error

APPENDIX D. STRENGTH OF EVIDENCE

OUTCOME	Strength of Evidence Elements[a]					Summary of Findings	
	Risk of Bias	Consistency	Directness	Precision	Publication Bias	Description of Effect	Strength of Evidence Direction[b]
KQ1: SLEEP PHYSICIAN CARE COMPARED TO MANAGEMENT BY PRIMARY CARE, SLEEP-SPECIALIST NURSES OR OTHER NON-SLEEP PHYSICIANS							
Access to care						We found no evidence for this outcome.	Insufficient
Epworth Sleepiness Scale (ESS)	Moderate	Consistent	Direct	Precise	Unclear	Based on 4 RCTs (n = 568), improvement from baseline in ESS scores was similar for patients being managed by primary care/sleep-specialist nurses compared to sleep specialist physicians (SMD = 0.06 [95% CI -0.15, 0.26]). One observational study also found ESS scores were similar between groups.	Moderate Similar
Quality of life	Moderate	Consistent	Direct	Precise	Unclear	Based on 3 RCTs (n = 524), quality of life measures were similar for patients being managed by primary care/ sleep-specialist nurses compared to sleep specialist physicians. SMDs for SF-36 Vitality and Mental Health scores were -0.04 [95% CI -0.22, 0.15]) and -0.04 [95% CI -0.22, 0.14], respectively	Moderate Similar
Compliance, hours per night	Moderate	Consistent	Direct	Precise	Unclear	Based on 4 RCTs (n = 568), compliance was similar for patients being managed by primary care/sleep-specialist nurses compared to sleep specialist physicians (WMD = -0.29 [95% CI -0.71, 0.12]). One observational cohort study also found compliance was similar between groups but one study based on retrospective chart review reported compliance was greater in the sleep specialist physician group compared to the non-sleep specialist group.	Moderate Similar
Adverse events	Moderate	Unknown	Direct	Imprecise	Unclear	Based on one RCT (n = 65) that did not report adverse events by treatment arm, the evidence is insufficient to draw conclusions.	Insufficient
KQ3: HOME APAP TECHNOLOGY VERSUS STANDARD IN-CENTER MANUAL CPAP TITRATION							
Access to care						We found no evidence for this outcome.	Insufficient

OUTCOME	Strength of Evidence Elements[a]					Summary of Findings	
	Risk of Bias	Consistency	Directness	Precision	Publication Bias	Description of Effect	Strength of Evidence Direction[b]
Epworth Sleepiness Scale (ESS)	Moderate	Consistent	Direct	Precise	Unclear	Based on 2 RCTs (n = 414) with moderate risk of bias, we found improvement from baseline in ESS scores was similar for patients allocated to home APAP titration compared to patients allocated to in-center CPAP titration (SMD = 0.0 [95% CI -0.22, 0.21]). One moderate risk of bias RCT (n = 68) found median change in EES scores from baseline was also similar between groups (MD -1 [95% CI --1, -4]). One observational cohort study also found ESS scores were similar between groups.	Moderate Similar
Quality of life	Moderate	Consistent	Direct	Precise	Unclear	Based on two RCTs (n = 414) with moderate risk of bias, we found quality of life measures were similar for patients allocated to home APAP titration compared to patients allocated to in-center CPAP titration. The SMDs for SF-36 Mental Health and Physical Health scores were 0.08 [95% CI -0.14, 0.29] and -0.21 [95% CI -0.61, 0.20], respectively. Results for the Physical Health scores were imprecise. One moderate risk of bias RCT (n = 68) found median improvement from baseline in the SAQLI was similar between groups (median difference = 0.17 [95% CI -0.6, 0.9])	Moderate Similar
Compliance, hours per night	Moderate	Inconsistent	Direct	Precise	Unclear	Based on two RCTs (n = 414) with moderate risk of bias, we found compliance was similar for patients allocated to home APAP titration compared to patients allocated to in-center CPAP titration (WMD = 0.02 [95% CI -0.41, 0.45]). One moderate risk of bias RCT (n = 68) found median compliance was better in the APAP group versus the CPAP group (MD -1.1 [95% CI -2.0, -0.2]). One observational cohort study found compliance was similar between groups	Low Similar

OUTCOME	Strength of Evidence Elements[a]					Summary of Findings	
	Risk of Bias	Consistency	Directness	Precision	Publication Bias	Description of Effect	Strength of Evidence Direction[b]
Adverse events	Moderate	Unknown	Direct	Imprecise	Unclear	Based on the findings of one RCT (n = 245) that reported no "important differences" in adverse events between the home APAP and in-lab CPAP and groups, the evidence is insufficient to draw conclusions.	Insufficient
KQ3: APAP VERSUS CPAP TREATMENT							
Access to care						We found no evidence for this outcome.	Insufficient
Epworth Sleepiness Scale (ESS)	Moderate	Consistent	Direct	Precise	Unclear	Based on four parallel group RCTs (n = 327) with aggregate moderate risk of bias, we found improvement from baseline in ESS scores was similar for patients allocated to APAP treatment compared to patients allocated to CPAP treatment (SMD = 0.18 [95% CI -0.06, 0.43]). Two parallel group trials not pooled (reported as a median or data not shown) also found improvement from baseline in ESS scores similar between groups. Ten crossover RCTs (n = 269) reported similar improvements between groups and two (N = 227) reported greater improvement with APAP.	Moderate Similar
Quality of life	Moderate	Consistent	Direct	Precise	Unclear	Based on 3 parallel group RCTs (n = 202) with aggregate moderate risk of bias, we found quality of life measures (SF-36, SAQLI) were similar for patients allocated to APAP treatment compared to patients allocated to CPAP treatment (data were not pooled due to variation in reporting of results, *ie,* reported as medians). Six crossover RCTs (n = 393) also reported no differences in most of the quality of life measures between the treatment groups.	Moderate Similar
Compliance, hours per night	Moderate	Consistent	Direct	Precise	Unclear	Based on 5 parallel group RCTs (n = 279) with aggregate moderate risk of bias, we found compliance was similar for patients allocated to APAP treatment compared to patients allocated to CPAP treatment (WMD = -0.08 [95% CI -0.55,	Moderate Similar

OUTCOME	Strength of Evidence Elements[a]					Summary of Findings	
	Risk of Bias	Consistency	Directness	Precision	Publication Bias	Description of Effect	Strength of Evidence Direction[b]
						0.38]). One parallel group RCT reporting median compliance, most of the remaining crossover RCTs, and one observational study also found compliance was similar between groups.	
Adverse events	Moderate	Consistent	Direct	Imprecise	Unclear	Adverse events were infrequently reported. One parallel group RCT (n = 109) reported adverse events, chest pain in 12% and 9% of APAP and CPAP patients, respectively. Five crossover trials reported adverse events for both APAP and CPAP treatments. One trial (n = 55) reported a higher frequency of total number of events and another trial (n = 34) reported a higher incidence of pressure discomfort with CPAP therapy arm compared with the APAP treatment. Three trials (n = 112) reported no differences in adverse events between the treatment groups.	Low Similar

AHI = apnea–hypopnea index ; APAP = Auto-adjusted (autoregulated) continuous positive airway pressure; CPAP = continuous positive airway pressure; RCT = randomized controlled trial; SF-36 = Short Form-36; SMD = standardized mean difference; WMD = weighted mean difference

[a]Strength of Evidence Elements[28]

Precision: Degree of certainty surrounding an effect estimate; in meta-analysis, the confidence interval around the summary effect size

Consistency: Degree to which reported effect sizes appear to have the same direction of effect

Directness: Whether the evidence links the interventions directly to health outcomes

Risk of bias: Degree to which includes studies have a high likelihood of protection against bias; 2 main elements are study design and aggregate quality of the studies

[b]Direction of difference between groups