



FACT SHEET – Obstructive Sleep Apnea (OSA) Health Risks Without and With CPAP/PAP Treatment

-Last Updated: August 13, 2026

OSA Health Consequence:	Untreated OSA Associated With:	OSA When Treated with PAP:	Has PAP been shown to <u>eliminate</u> the excess risk in OSA?
Sleep symptoms*	OSA produces snoring, disrupted sleep, fatigue and impaired daytime functioning. [1][10]	YES. PAP clearly improves <i>sleep symptoms</i> in many patients. [1][10]	YES, while PAP is used. PAP controls obstructive physiology and symptoms, but does not establish that prior injury or all long-term excess risk has normalized. [1][12]
Quality of life / mood	OSA can impair health-related quality of life and mood. [10][12]	YES. Randomized evidence shows improvement in health-related quality of life and mood. [10][12]	SUBSTANTIAL BENEFIT, not universal normalization. These are established patient-centered PAP benefits. [10][12]
Daytime sleepiness / impaired alertness	One of the best-established direct consequences of OSA. [1][10]	YES. PAP clearly improves this, particularly in symptomatic patients. [1][10]	SUBSTANTIALLY, but not universally. Residual sleepiness can remain in some treated patients. [1][10]
Motor-vehicle crashes / accidents	OSA-related sleepiness substantially increases crash risk. [10][11]	Strong observational/real-world evidence of benefit. PAP treatment is associated with a major reduction in motor-vehicle crash risk. [11]	Risk greatly reduced, but normalization is not definitively established. This is nevertheless among the strongest real-world safety benefits of treatment. [11]
Premature death from all causes*	Moderate/severe OSA is associated with increased overall mortality. [1][2]	Observational (but not randomized) studies generally associate PAP with lower mortality and cardiovascular events. [2][15]	NOT DEMONSTRATED. Randomized trials have not shown a statistically significant reduction in overall mortality. The 2024 systematic review likewise found no demonstrated randomized-trial mortality benefit. [1][2][12][13]
Cardiovascular death*	OSA is associated with cardiovascular disease and cardiovascular mortality, particularly with greater severity and nocturnal hypoxemia. [1][5]	Observational (but not randomized) studies suggest PAP may reduce cardiovascular mortality. [2]	NOT DEMONSTRATED. Randomized trials have not independently established a significant reduction in cardiovascular death. [1][2][12][13]
Heart attack / coronary disease*	OSA is associated with coronary artery disease and myocardial infarction. [1][5]	PAP improves oxygenation, sympathetic stress and some cardiovascular risk factors. [5][9]	NOT DEMONSTRATED. Randomized trials have not demonstrated a significant reduction in myocardial infarction; the 2024 review found an effect estimate of 1.05. [1][12][13]
Stroke*	OSA is associated with stroke and cerebrovascular disease. [1][5]	PAP eliminates or greatly reduces nightly airway obstruction and hypoxemia while being used. [1]	NOT DEMONSTRATED. Randomized evidence has not demonstrated that PAP prevents stroke; the 2024 review found no significant reduction. [1][12][13]

***EVIDENCE NOTE:** Major cardiovascular RCTs often enrolled minimally sleepy patients and achieved only ~3-4 hours/night of PAP use; SAVE averaged 3.3 hours/night. Better adherence has been associated with lower recurrent cardiovascular risk in on-treatment analyses. Thus, failure to show benefit in intention-to-treat RCTs is not proof of no benefit with effective all-night PAP. [12][13][14].

High blood pressure / resistant hypertension	OSA can contribute causally to hypertension through intermittent hypoxia, sympathetic activation and related mechanisms. [3][5]	YES , PAP helps. Randomized evidence shows modest blood-pressure reductions, greatest when BP is uncontrolled. [3]	NOT ELIMINATED. PAP lowers BP but does not reliably eliminate hypertension or normalize BP in everyone. [3]
Atrial fibrillation and other arrhythmias	OSA is strongly associated with AF and creates conditions favoring arrhythmia and atrial remodeling. [4][5]	Observational studies often show markedly less recurrent AF in PAP users, particularly after ablation. [4]	NOT ESTABLISHED. In this 2025 post-ablation meta-analysis, 10 of 11 studies were observational; its single included randomized trial found no difference. [4]
Heart failure	OSA is associated with heart failure and adverse cardiac remodeling. [5]	PAP can improve nocturnal oxygenation, cardiac loading conditions and selected physiologic measures. [5]	NOT DEMONSTRATED. Evidence does not establish elimination of heart-failure risk or reversal of established cardiovascular disease. This row concerns OSA, not central sleep apnea. [1][5]
Type 2 diabetes / abnormal glucose metabolism	OSA is associated with insulin resistance and diabetes independently of obesity to at least some degree. [5]	PAP may improve insulin sensitivity in some patients. [5]	NOT DEMONSTRATED. Randomized evidence has not established prevention of diabetes or normalization of long-term glycemic risk. [1]
Cognitive impairment / dementia	OSA is associated with cognitive impairment and increased dementia risk in longitudinal literature, although causality remains uncertain. [16]	PAP can improve sleepiness and some cognitive functions; recent observational evidence suggests treatment may slow cognitive decline in some populations. [6]	NOT DEMONSTRATED. There is inadequate evidence that PAP eliminates dementia risk or fully reverses established neurocognitive effects; long-term trials are still needed. [6]
Chronic kidney disease / renal injury	OSA is associated with CKD and renal dysfunction; the relationship may be bidirectional. [7]	Some studies indicate improvements in renal measures with PAP. [7]	NOT DEMONSTRATED. Renal benefit remains uncertain; larger, longer randomized trials are needed. [7]
Cancer incidence / cancer death	OSA and particularly nocturnal hypoxemia have been associated with cancer incidence and mortality, although results are heterogeneous and causation remains uncertain. [8]	PAP has been proposed as potentially protective by reducing intermittent hypoxia. [8]	NOT ESTABLISHED. Randomized evidence is insufficient to determine whether PAP reduces cancer incidence or cancer mortality. [8]
Inflammation, sympathetic activation and vascular dysfunction	Repetitive hypoxia and arousals activate sympathetic, oxidative, inflammatory and vascular pathways. [5][9]	PAP suppresses the initiating nightly obstruction and improves several intermediate physiologic abnormalities. [9]	COMPLETE REVERSAL NOT DEMONSTRATED. Improvement in biomarkers or physiology does not establish reversal of pre-existing vascular or organ damage. [5][9]

CITATIONS:

- [1] Balk EM, Adam GP, Cao W, Bhuma MR, D'Ambrosio C, Trikalinos TA. **Long-term effects on clinical event, mental health, and related outcomes of CPAP for obstructive sleep apnea: a systematic review.** *Journal of Clinical Sleep Medicine*. 2024;20(6):895–909. doi:10.5664/jcsm.11030. PMID: 38300818. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11145052/> Review concluded that whether CPAP changes long-term health outcomes remains largely unanswered and found no statistically significant randomized-trial benefit for mortality, cardiovascular death, myocardial infarction, stroke, incident atrial fibrillation, or incident diabetes.
- [2] Benjafield AV, Pepin J-L, Cistulli PA, et al. **Positive airway pressure therapy and all-cause and cardiovascular mortality in people with obstructive sleep apnoea: a systematic review and meta-analysis of randomised controlled trials and confounder-adjusted, non-randomised controlled studies.** *Lancet Respiratory Medicine*. 2025;13(5):403–413. doi:10.1016/S2213-2600(25)00002-5. PMID: 40118084. <https://pubmed.ncbi.nlm.nih.gov/40118084/> The pooled analysis favored PAP, whereas the randomized-trial subgroup did not establish a statistically significant all-cause mortality reduction.
- [3] Pengo MF, et al. **Effect of CPAP therapy on blood pressure in patients with obstructive sleep apnoea: a worldwide individual patient data meta-analysis.** *European Respiratory Journal*. 2025;65(1):2400837. doi:10.1183/13993003.00837-2024. PMID: 39401854. <https://pubmed.ncbi.nlm.nih.gov/39401854/> The analysis included 36 randomized studies and found the greatest blood-pressure benefit among patients whose blood pressure was uncontrolled at baseline.
- [4] Itaya ED, et al. **Efficacy of continuous positive airway pressure on atrial fibrillation recurrence after catheter ablation in patients with obstructive sleep apnea: a systematic review and meta-analysis.** *Journal of Interventional Cardiac Electrophysiology*. 2025. doi:10.1007/s10840-025-02063-2. PMID: 40506608. <https://pubmed.ncbi.nlm.nih.gov/40506608/> The meta-analysis included 10 observational studies and one RCT; the pooled observational evidence favored CPAP, while the single randomized trial showed no difference.
- [5] Tasali E, Pamidi S, Covassin N, Somers VK. **Obstructive Sleep Apnea and Cardiometabolic Disease: Obesity, Hypertension, and Diabetes.** *Circulation Research*. 2025;137(5):764–787. doi:10.1161/CIRCRESAHA.125.325676. PMID: 40811500. <https://pubmed.ncbi.nlm.nih.gov/40811500/> This contemporary review addresses the cardiovascular, autonomic, metabolic, inflammatory, and hypertensive consequences of OSA and the effects and limitations of CPAP treatment.
- [6] Oliver C, Li H, Biswas B, et al. **A systematic review on adherence to continuous positive airway pressure (CPAP) treatment for obstructive sleep apnoea (OSA) in individuals with mild cognitive impairment and Alzheimer's disease dementia.** *Sleep Medicine Reviews*. 2024;73:101869. doi:10.1016/j.smrv.2023.101869. PMID: 37924680. <https://pubmed.ncbi.nlm.nih.gov/37924680/> Concluded that long-term, adequately powered efficacy trials are needed for whether CPAP slows cognitive decline in patients with MCI or Alzheimer disease.
- [7] Peng HH, Hu CE, Wu YL, Liu WT, Tsai CY, Kuan YC. **Effects of continuous positive airway pressure on renal function in adults with obstructive sleep apnea: a systematic review and meta-analysis.** *Sleep and Breathing*. 2025;29(1):102. doi:10.1007/s11325-025-03256-9. PMID: 39945962. <https://doi.org/10.1007/s11325-025-03256-9> The review included 4 randomized and 7 non-randomized studies and concluded that current evidence suggests CPAP has little or no demonstrated effect on slowing renal-function decline, with larger and longer RCTs needed.
- [8] Tan BKJ, Teo YH, Tan NK, Yap DWT, Sundar R, Lee CH, et al. **Association of obstructive sleep apnea and nocturnal hypoxemia with all-cancer incidence and mortality: a systematic review and meta-analysis.** *Journal of Clinical Sleep Medicine*. 2022;18(5):1427–

1440. doi:10.5664/jcsm.9772. PMID: 34755597. <https://pmc.ncbi.nlm.nih.gov/articles/PMC9059590/> The review found nocturnal hypoxemia associated with all-cancer risk and mortality, while emphasizing that further work is needed to determine whether OSA treatment alters cancer outcomes.

[9] Zhu Q, Luo Q, Wang Z, et al. **Effects of continuous positive airway pressure therapy on inflammatory markers in patients with obstructive sleep apnea: a meta-analysis of randomized controlled trials.** *Sleep and Breathing*. 2025;29(2):182. doi:10.1007/s11325-025-03348-6. PMID: 40346316. <https://pmc.ncbi.nlm.nih.gov/articles/PMC12064446/> Meta-analysis found reductions in inflammatory markers with CPAP treatment.

[10] Feltner C, Wallace IF, Aymes S, et al. **Screening for Obstructive Sleep Apnea in Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force.** *JAMA*. 2022;328(19):1951–1971. PMID: 36378203. <https://pubmed.ncbi.nlm.nih.gov/36378203/> The review found that PAP significantly improves daytime sleepiness and sleep-related and general health-related quality of life, while evidence for most long-term clinical outcomes remains limited.

[11] Tregear S, Reston J, Schoelles K, Phillips B. **Continuous positive airway pressure reduces risk of motor vehicle crash among drivers with obstructive sleep apnea: systematic review and meta-analysis.** *Sleep*. 2010;33(10):1373–1380. doi:10.1093/sleep/33.10.1373. PMID: 21061860. <https://pubmed.ncbi.nlm.nih.gov/21061860/> Meta-analysis found significant reduction in motor-vehicle crash risk with CPAP treatment.

[12] McEvoy RD, Antic NA, Heeley E, et al.; SAVE Investigators and Coordinators. **CPAP for Prevention of Cardiovascular Events in Obstructive Sleep Apnea.** *New England Journal of Medicine*. 2016;375(10):919-931. doi:10.1056/NEJMoa1606599. PMID: 27571048. <https://pubmed.ncbi.nlm.nih.gov/27571048/> The SAVE trial enrolled predominantly minimally sleepy patients; mean CPAP use was 3.3 hours/night. It found no significant cardiovascular-event reduction but improved sleepiness, quality of life and mood.

[13] Sánchez-de-la-Torre M, Gracia-Lavedan E, Benitez ID, et al. **Adherence to CPAP Treatment and the Risk of Recurrent Cardiovascular Events: A Meta-Analysis.** *JAMA*. 2023;330(13):1255-1265. doi:10.1001/jama.2023.17465. PMID: 37787793. <https://pubmed.ncbi.nlm.nih.gov/37787793/> Intention-to-treat analysis found no MACCE reduction; an on-treatment analysis associated good adherence (≥ 4 hours/day) with lower MACCE risk.

[14] Patil SP, Billings ME, Bourjeily G, Collop NA, Gottlieb DJ, Johnson KG, Kimoff RJ, Pack AI. **Long-term health outcomes for patients with obstructive sleep apnea: placing the Agency for Healthcare Research and Quality report in context-a multisociety commentary.** *Journal of Clinical Sleep Medicine*. 2024. doi:10.5664/jcsm.10832. PMID: 37904571. <https://pubmed.ncbi.nlm.nih.gov/37904571/> Highlights limitations of long-term OSA outcome trials, including patient selection, adherence and ethical constraints on untreated symptomatic OSA.

[15] Mazzotti DR, Waitman LR, Miller J, et al. **Positive Airway Pressure, Mortality, and Cardiovascular Risk in Older Adults With Sleep Apnea.** *JAMA Network Open*. 2024;7(9):e2432468. doi:10.1001/jamanetworkopen.2024.32468. PMID: 39259540. <https://pubmed.ncbi.nlm.nih.gov/39259540/> In 888,835 Medicare beneficiaries with OSA, PAP initiation/utilization was observationally associated with lower all-cause mortality and MACE incidence.

[16] Tian Q, Sun J, Li X, et al. **Association between sleep apnoea and risk of cognitive impairment and Alzheimer's disease: a meta-analysis of cohort-based studies.** *Sleep and Breathing*. 2024;28(2):585-595. doi:10.1007/s11325-023-02934-w. PMID: 37857768. <https://pubmed.ncbi.nlm.nih.gov/37857768/> The pooled cohort evidence found higher cognitive-impairment/dementia risk with OSA/SDB, while noting important diagnostic and causal limitations.