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Management of Obstructive Sleep Apnea (OSA) Across the Care Continuum: An Interdisciplinary Narrative Review

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Abstract

Background: Obstructive Sleep Apnea (OSA) is a highly prevalent yet critically underdiagnosed disorder affecting nearly 1 billion adults globally. It represents a major public health burden, significantly increasing the risk of hypertension, atrial fibrillation, heart failure, stroke, and perioperative complications. Despite its systemic impact, OSA management remains fragmented, with poor coordination between primary care, diagnostic services, therapeutic support, and surgical specialties. **Aim:** This narrative review synthesizes evidence from 2010-2024 on integrated, multidisciplinary care models for OSA across the entire patient journey, from community screening to long-term management and perioperative safety. **Methods:** A comprehensive literature search of PubMed, Scopus, CINAHL, and Web of Science was conducted. Thematic analysis integrated findings from sleep medicine, cardiology, anesthesiology, primary care, and nursing literature. **Results:** Evidence strongly supports that coordinated care pathways—featuring systematic screening in primary care, efficient diagnostic testing, nurse-led titration and adherence programs, and proactive perioperative risk stratification—significantly improve diagnostic rates, positive airway pressure (PAP) adherence, cardiovascular outcomes, and reduce postoperative complications. The failure to integrate these disciplines leads to diagnostic delays, poor treatment adherence, and preventable morbidity. **Conclusion:** OSA must be managed as a chronic cardiovascular and perioperative risk condition, not an isolated breathing disorder. Effective care requires dismantling silos through standardized protocols, shared electronic health record tools, and dedicated interdisciplinary sleep teams to optimize patient outcomes and health system efficiency.

Keywords: Obstructive Sleep Apnea, multidisciplinary care, continuous positive airway pressure, perioperative risk, cardiovascular disease

Introduction

Obstructive Sleep Apnea (OSA) is a pervasive disorder characterized by recurrent episodes of complete (apnea) or partial (hypopnea) upper airway collapse during sleep, leading to hypoxia, hypercapnia, and cortical arousals. With a global prevalence estimated at nearly 1 billion adults, it constitutes one of the most common chronic medical conditions (Benjafield et al., 2019). However, its significance extends far beyond snoring and daytime sleepiness. OSA is now unequivocally recognized as an independent risk factor for a cascade of serious cardiovascular (CV) and metabolic sequelae, including resistant hypertension, pulmonary hypertension, atrial fibrillation, heart failure, coronary artery disease, stroke, and type 2 diabetes

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(Drager et al., 2017; Javaheri et al., 2017). Furthermore, it poses a profound threat to surgical safety, increasing the risk of perioperative respiratory failure, cardiac events, unplanned intensive care unit (ICU) transfers, and prolonged hospitalization (Bae, 2023). Despite this overwhelming burden, a staggering 80-90% of cases remain undiagnosed and untreated, representing a massive failure in preventive medicine and chronic disease management (Soori et al., 2022).

This gap between prevalence and diagnosis is fundamentally a systems failure, rooted in fragmented care. Traditionally, OSA management has been confined to sleep specialty clinics, creating bottlenecks in access to diagnostic polysomnography (PSG) and leaving primary care providers—who see at-risk patients daily—ill-equipped to manage the condition comprehensively (Shamim-Uzzaman et al., 2021). This fragmentation creates dangerous care gaps: a patient screened in cardiology for atrial fibrillation may have undiagnosed OSA driving the arrhythmia; a patient scheduled for surgery may harbor undiagnosed severe OSA, unbeknownst to the anesthesiologist; and a patient prescribed CPAP may struggle with adherence without sustained, specialized nursing support.

This narrative review synthesizes contemporary evidence (2010-2024) to argue for and delineate the components of an integrated, system-based approach to OSA management. Moving beyond the sleep specialist's purview, it analyzes the essential, synergistic roles of Family Medicine, the Sleep Laboratory, Nursing, and Anesthesia. The central thesis is that OSA is a quintessential chronic disease requiring longitudinal, team-based care that spans the continuum from community-based screening and diagnosis to long-term therapy adherence and perioperative risk mitigation. Effective management demands seamless collaboration across these disciplines to address not only the airway but also its downstream cardiovascular and perioperative consequences. This review will evaluate the evidence for such integrated pathways, focusing on their impact on critical outcomes: rates of diagnosis and treatment initiation, adherence to positive airway pressure (PAP) therapy, reduction in cardiovascular event rates, and improvement in perioperative morbidity and mortality.

Family Medicine in Screening, Diagnosis, and Comorbidity Management

The primary care setting is the logical and most effective locus for OSA case-finding, given its longitudinal relationship with patients and its role in managing the very comorbidities linked to OSA. However, proactive screening is not routinely performed, often due to time constraints and lack of clear pathways (Bock et al., 2022).

Systematic Screening and Risk Stratification

Family physicians must adopt a systematic approach to identifying at-risk individuals. Validated screening tools like the STOP-BANG questionnaire (Snoring, Tiredness, Observed apnea, high blood Pressure, BMI, Age, Neck circumference, Gender) have high sensitivity for moderate-to-severe OSA and can be efficiently administered during routine visits for hypertension, obesity, atrial fibrillation, or type 2 diabetes (Hwang et al., 2022). A high STOP-BANG score (≥3) should trigger further evaluation. Beyond screening, family medicine plays a critical role in comorbidity management. Treating OSA can improve blood pressure control and glycemic parameters, making it a powerful intervention in managing resistant hypertension and diabetes (Cheng et al., 2023; Shaw et al., 2008). The family physician thus acts as the integrator, connecting the dots between sleep-disordered breathing and its systemic manifestations.

Navigating the Diagnostic Pathway and Initial Therapy

Following a positive screen, the family physician's role shifts to facilitating diagnosis. The traditional pathway of an in-lab polysomnogram (PSG) is resource-intensive and faces long wait times. Evidence strongly supports the use of home sleep apnea testing (HSAT) as a first-line diagnostic tool for patients with a high pre-test probability and no significant cardiopulmonary comorbidities (Kapur et al., 2017). The family physician can order an HSAT, interpret the results with support from sleep specialists (often via telemedicine platforms), and initiate first-line therapy. This includes counseling on lifestyle modifications (weight loss, positional therapy, alcohol avoidance), which are foundational and synergistic with PAP therapy (Carneiro-Barrera et al., 2019). By managing this initial diagnostic and therapeutic step, primary care becomes the engine of case identification, reducing the burden on sleep labs for straightforward cases and reserving specialist consultation for complex patients (Carneiro-Barrera et al., 2022).

The Diagnostic Core: The Sleep Laboratory's Evolving Role

The sleep laboratory, encompassing both in-lab and home-based testing, provides the objective data that confirms diagnosis, quantifies severity, and guides therapy. Its role has evolved from purely diagnostic to a more nuanced, patient-centered one.

From Polysomnography to a Tiered Diagnostic Approach

The in-lab, technician-attended PSG remains the gold standard, particularly for complex cases, comorbid central sleep apnea, or titration of advanced PAP modes like bilevel or adaptive servoventilation (ASV) (Randerath et al., 2018). However, for uncomplicated cases, HSAT is non-inferior for diagnosis and is more accessible and cost-effective. The laboratory's role is thus to manage a tiered diagnostic service, triaging patients appropriately based on referral information from primary care (O'Donnell et al., 2020). Laboratory analysis also

extends to arterial blood gas (ABG) analysis in patients with suspected obesity hypoventilation syndrome (OHS) or severe COPD-OSA overlap, providing critical data on daytime hypercapnia that dramatically alters management (Mokhlesi & Tulaimat, 2007).

The Critical Role of the Sleep Technologist and PAP Titration

Sleep technologists (often with nursing backgrounds) are instrumental in the in-lab process. Beyond conducting the study, they perform the crucial PAP titration during a split-night or follow-up PSG to determine the optimal pressure that eliminates apneas, hypopneas, and snoring while maintaining patient comfort and sleep architecture (Patil et al., 2019). This precise pressure setting is foundational for long-term therapy success. The laboratory also serves as a source of objective adherence and efficacy data downloaded from PAP devices, which is essential for monitoring and troubleshooting (Donovan et al., 2023). Figure 1 illustrates the multidisciplinary OSA care pathway across the continuum of care.

Table 1: The Interdisciplinary OSA Care Pathway: Roles and Handoffs

Stage of Care	Family Medicine / Primary Care	Sleep Laboratory & Diagnostics	Nursing & Respiratory Therapy	Anesthesia & Perioperative Medicine
1. Screening & Identification	Administer STOP-BANG/Epworth; Identify high-risk comorbidities (HTN, AFib, DMII).	–	–	Pre-op assessment: Incorporate OSA screening into surgical pre-assessment clinics.
2. Diagnosis & Severity Stratification	Order HSAT; Interpret basic results; Refer complex cases for PSG.	Perform & interpret HSAT/PSG; Titrate PAP in-lab; Analyze ABG if OHS suspected.	–	–
3. Therapy Initiation & Adherence	Prescribe CPAP/APAP; Reinforce lifestyle measures; Manage linked comorbidities.	Transmit diagnostic & titration data to prescribing MD & nursing.	**CPAP Initiation:** Mask fitting, acclimatization, device education. **Adherence Coaching:** Follow-up calls, remote monitoring review, troubleshooting.	–
4. Long-Term Management	Monitor BP, glycemic control; Annual OSA status review; Re-evaluate therapy needs.	Provide periodic efficacy download reports.	Ongoing adherence support; Address mask/comfort issues; Advanced interface trials.	–
5. Perioperative Pathway	Ensure surgery team is aware of OSA diagnosis & therapy.	–	Ensure patient brings PAP device to hospital; Post-op PAP re-initiation support.	**Pre-op:** Risk stratification, airway planning, anesthesia technique selection. **Intra-op:** Avoid sedatives, use OSA-friendly protocols, extubate fully awake. **Post-op:** Enhanced monitoring (e.g., pulse oximetry), multi-modal analgesia to minimize opioids.

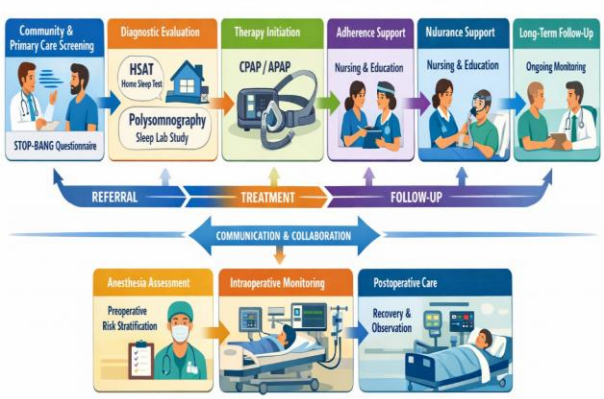

Figure 1. Integrated Care Continuum for Obstructive Sleep Apnea (OSA)

The Therapeutic Anchor: Nursing-Led Adherence Coaching and Long-Term Support

The initiation of PAP therapy is a critical behavioral intervention with notoriously high rates of non-adherence (often defined as <4 hours/night). Without dedicated support, up to 50% of patients abandon therapy within the first year (Lajoie et al., 2022). This is where nursing, often in the form of dedicated respiratory nurse specialists or sleep coordinators, becomes the most crucial determinant of long-term success.

The "First 90 Days" and Beyond: Structured Adherence Programs

Nursing-led interventions are most effective when structured and proactive. Key components include: In-person or virtual CPAP education sessions that go beyond the device manual to address fears, expectations, and practical tips; Expert mask fitting, as interface comfort is the primary reason for non-adherence (Bakker et al., 2019); Scheduled follow-up within the first week, first month, and at three months to address problems early; and Remote monitoring via telemedicine platforms that allow nurses to review objective adherence and efficacy data (leak, residual apnea-hypopnea index) and proactively contact patients who are struggling (O'Donnell et al., 2020). This model transforms PAP therapy from a device dispensed into a managed chronic therapy.

Troubleshooting and Advanced Therapy Navigation

Nurses are frontline troubleshooters, managing issues like nasal congestion, aerophagia, skin breakdown, and claustrophobia. They can trial different mask types, recommend humidification adjustments, and collaborate with physicians on pressure modifications or alternative therapies (e.g., mandibular advancement devices) when CPAP fails (Ramar et al., 2015). Their longitudinal relationship with the patient builds trust and is central to sustaining behavioral change, making them the anchor of the chronic care model for OSA.

Anesthesia's Role in Risk Mitigation

Undiagnosed or poorly managed OSA is a well-established risk factor for perioperative complications, including difficult airway management, acute respiratory failure, hypoxemia, and cardiac events (Chung et al., 2016). The anesthesiologist's role is to identify this risk, plan accordingly, and manage the patient through the high-risk postoperative period (Lukachan et al., 2023).

Preoperative Identification and Stratification

The preoperative clinic must incorporate systematic OSA screening (e.g., STOP-Bang) for all elective surgical patients. A high score should trigger a review of known OSA status and PAP use (Lockhart et al., 2013). For patients with known OSA, the anesthesia team must confirm they have and will bring their PAP device to the hospital. This preoperative "time-out" for OSA is as critical as any surgical safety check.

Intraoperative and Postoperative Management Strategies

Intraoperative management focuses on minimizing risk: airway planning for potential difficulty, preference for regional anesthesia when appropriate, avoidance of deep sedation without secured airway, and use of short-acting anesthetic agents (Joshi et al., 2012). The greater challenge lies postoperatively. Patients with OSA are exquisitely sensitive to opioids, which suppress upper airway tone and ventilatory drive. Therefore, a multi-modal opioid-sparing analgesia regimen (using acetaminophen, NSAIDs, nerve blocks, gabapentinoids) is paramount (Altree et al., 2021). Furthermore, these patients require enhanced postoperative monitoring, often with continuous pulse oximetry in a step-down unit, and strict instructions to use their PAP device immediately upon returning to the ward. The anesthesia team's proactive planning in collaboration with the surgical and nursing teams can dramatically reduce adverse respiratory events (Azizad & Joshi, 2023).

The Impact of Integrated Care

The evidence for coordinated, interdisciplinary OSA management is compelling. Integrated pathways have been shown to: Increase diagnostic rates by embedding screening into routine primary care and cardiology visits (Wickwire et al., 2020); Improve PAP adherence by 30-50% through structured nursing support programs compared to usual care (Buyse et al., 2022; Gong et al., 2018); Reduce cardiovascular risk, with meta-analyses demonstrating that CPAP therapy significantly lowers 24-hour and nocturnal blood pressure, especially in resistant hypertension (McEvoy et al., 2016; Pengo et al., 2020); and Decrease perioperative complications, with studies showing that systematic screening and perioperative CPAP use can reduce post-op respiratory failure by over 50% (Hondjeu et al., 2022;

Mutter et al., 2014). Figure 2 summarizes the distinct yet interdependent roles of key disciplines in OSA management.

However, significant barriers to implementation persist, as outlined in Table 2. These include reimbursement structures that favor procedural care over chronic disease management and nursing support, lack of integrated electronic health record (EHR) tools to facilitate handoffs and data sharing, and workforce shortages in sleep medicine and respiratory nursing.

Table 2: Barriers and Enablers to Implementing Integrated OSA Care

Domain	Key Barriers	Critical Enablers
Clinical Practice & Workflow	Lack of time for screening in primary care; No clear referral pathways to sleep lab; Poor communication between perioperative teams.	EHR-integrated screening prompts (STOP-Bang); Standardized referral order sets; Pre-op checklists mandating OSA status review; Shared digital care plans.
Financial & Reimbursement	Poor payment for HSAT interpretation, nursing adherence calls, and chronic care management. Limited coverage for alternative therapies.	Bundled payments for OSA management episodes; Value-based contracts tied to adherence metrics & CV outcome improvement; Adequate reimbursement for telemedicine follow-up.
Technology & Data	PAP adherence data siloed on vendor cloud platforms; Lack of interoperability with EHR; No centralized registry for tracking outcomes.	Mandated EHR integration for PAP data; Development of population health dashboards for OSA; Use of patient-facing apps for symptom tracking & education.
Education & Awareness	Low awareness among non-sleep specialists (e.g., surgeons, cardiologists) of OSA's impact; Patient misconception of OSA as only a "snoring" problem.	Interprofessional education initiatives; Public health campaigns on OSA as a CV risk factor; Mandatory OSA modules in medical, nursing, and anesthesia training curricula.

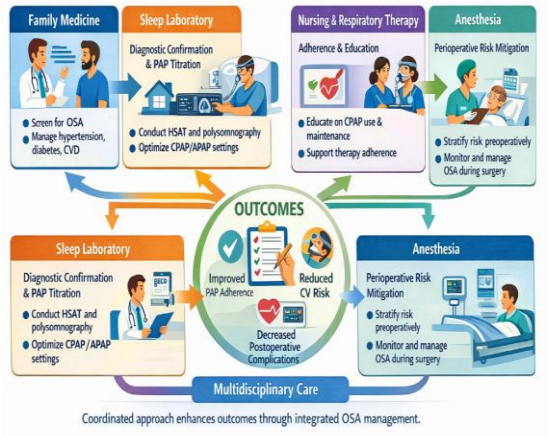

Figure 2. Multidisciplinary Roles and Outcomes in OSA Management

Conclusion and Future Directions

Obstructive Sleep Apnea is a prototypical chronic disease of the 21st century—highly prevalent, intricately linked to major health burdens, and demanding a coordinated, lifelong management strategy. This review underscores that effective care cannot be delivered within a single specialty silo. It requires a system that actively screens in primary care, efficiently diagnoses with modern tools, supports therapy adherence with dedicated nursing, and proactively mitigates risk in surgical settings.

The path forward requires deliberate system redesign. Operationally, health systems should establish OSA Management Programs led by interdisciplinary teams with clear protocols for handoffs between family medicine, the sleep lab, nursing, and anesthesia. Technologically, EHRs must evolve to support this integration, with shared screening tools, diagnostic data repositories, and PAP adherence dashboards visible to all caregivers. Financially, payment models must shift to reward outcomes—such as improved adherence, better blood pressure control, and reduced hospital readmissions—rather than merely funding diagnostic tests and device sales.

Ultimately, managing OSA across the continuum is an exercise in preventive cardiology, perioperative safety, and chronic care excellence. By building collaborative bridges between disciplines, we can transform OSA from a commonly overlooked condition into a routinely identified and effectively managed driver of health, improving quality of life, extending lifespan, and creating safer surgical experiences for millions of patients.

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