CHEST

Sleep-Disordered Breathing in Hospitalized Patients

A Game Changer?

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Sleep disorders, including sleep apnea, have become a significant health issue in the United States. It is estimated that 22 million Americans have sleep apnea, with 80% of cases of moderate and severe OSA going undiagnosed. This number continues to increase with the obesity epidemic. Sleep-disordered breathing (SDB) is associated with multiple cardiopulmonary diseases and has been shown to affect disease outcomes adversely. Hospitalized patients have a disproportionately high prevalence of cardiovascular and respiratory diseases. Screening for SDB in hospitalized patients provides an opportunity to identify the disease in individuals whose disease otherwise may go unrecognized. Data suggest that identification of SDB in hospitalized individuals may have a positive impact on a patient's course after hospitalization. Unfortunately, sleep medicine currently remains an ambulatory practice. Hospital sleep medicine addresses this separation. Herein, we discuss our experience and the future potential of hospital sleep medicine programs. CHEST 2022; 161(4):1083-1091

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Rationale for Hospital Sleep Medicine

Sleep-disordered breathing (SDB) is a common yet underrecognized disorder with increasing prevalence.[1-3] Current care models on the whole are inadequate because a recent report suggests that approximately 1 billion people are affected worldwide.[2] The prevalence of SDB is higher in patients with hypertension, congestive heart failure (CHF), stroke, atrial fibrillation, myocardial infarction, and diabetes mellitus as well as some phenotypes of COPD.[4-10] Additionally, the presence of SDB has been shown to worsen outcomes in patients with cardiovascular and pulmonary disease.[11-16] Despite these profound implications of SDB, it remains a disease considered only in ambulatory clinics; patients hospitalized with acute cardiopulmonary conditions rarely are screened, educated, or treated for SDB. The reasons for this dichotomy stem from multiple factors including logistics, cost of sleep studies (not reimbursed if performed in hospital settings), limited data on benefit, and belief that acutely sick

ABBREVIATIONS: AHI = apnea hypopnea index; APAP = automatic positive airway pressure; CHF = congestive heart failure; CVA = cardiovascular accident; HRPO = high-resolution pulse oximetry; ODI = oxygen desaturation index; PAP = positive airway pressure; PM = portable sleep monitor; PSG = polysomnography; RT = respiratory therapist; SDB = sleep-disordered breathing; SEAT-COM = Screening Evaluating Acclimatization Treatment and Communication Protocol; SQ = sleep questionnaire; STOP = Snoring, Tiredness During Daytime, Observed Apnea, High BP; STOP-BANG = Snoring, Tiredness During Daytime, Observed Apnea, High BP, BMI, Age, neck-collar size, gender

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hospitalized patients may not reflect the state of a chronic disease (overestimation of disease or severity).[12]

The recent report by the United States Preventive Service Task Force recommending against routine screening for OSA further adds to this misconception.[17] Although the United States Preventive Service Task Force recommendation applies only to relative health ambulatory settings, as opposed to sicker patients with significant comorbidities seen in hospitalized settings, data to suggest a potential outcome benefit from the evaluation for and treatment of inpatient SDB are growing. An effective screening / early diagnosis program is determined by the prevalence of the condition in an environment, presence of low-cost screening tools, and availability of effective therapeutic intervention. We address all these issues in this review and provide a detailed structure of our current hospital sleep medicine program.

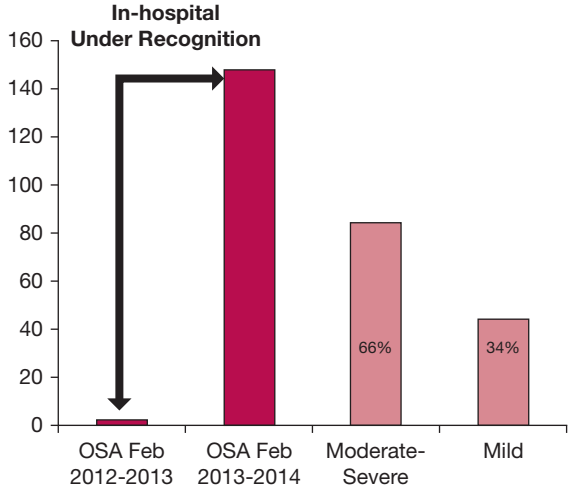
Data Supporting Hospital Sleep Medicine

Data are ample regarding the high prevalence of SDB in hospitalized patients.[18-22] In one study, two of five hospitalized patients older than 50 years were found to be at high risk for OSA using a screening questionnaire.[22] Sharma et al[23] not only showed high prevalence based on screening, but also demonstrated substantial increase in OSA diagnosis with a formal hospital sleep program (Fig 1). OSA has been shown to be an independent risk factor for hospital readmission.[24]

Data on the outcome benefit with early detection and intervention of SDB in hospitalized patients are increasing. Recent studies have shown that early detection and intervention of SDB in hospitalized patients may reduce readmissions in both CHF and COPD.[25,26] A recent randomized controlled trial also affirmed reduction in 6-month readmission in patients with CHF who had received a diagnosis of OSA during hospitalization and were initiated on positive airway pressure (PAP) therapy.[27] In addition to reduced readmission, early recognition and in-patient intervention also have shown improvement in in-hospital patient safety. Sharma et al[28] showed that hospitalized patients with recognized OSA were at high risk for a rapid response event, and early initiation of PAP therapy significantly reduced respiratory events during admission. Furthermore, patients with previously undiagnosed SDB admitted to the hospital and given narcotics were found to be at higher risk for adverse events, including respiratory compromise and ICU transfer, than those not given narcotics.[29] Our two-center randomized controlled study also revealed that early intervention with PAP therapy significantly reduced pulmonary pressures in patients admitted with acute heart failure and who were found to have SDB.[30] A randomized controlled trial also showed significant improvement in ejection fraction on initiation of PAP for newly diagnosed OSA in patients admitted with acute decompensated heart failure.[31] In the largest published observational study to date of 5,000 hospitalized patients who underwent early detection and therapeutic intervention over a 3-year period, significantly improved survival was observed among the compliant vs noncompliant group.[32] An upcoming randomized controlled trial is exploring the usefulness of adaptive servoventilation in patients admitted with acute myocardial infraction who undergo percutaneous coronary intervention.[33] These data suggest that early detection of and intervention for SDB in hospitalized patients can be performed effectively and may result in improved patient outcomes in terms of hospital safety, readmission, and ED visits and may confer long-term survival benefits.

How Do We Define a Hospital Sleep Medicine Program?

Proactive screening and early recognition of SDB in hospitalized patients are the core elements defining the essence of a hospital sleep medicine program. Patient education on proper sleep hygiene, implications of



Bars on right side indicate percentage of patients with moderate-severe and mild sleep apnea in this group. OSA, obstructive sleep apnea.

Figure 1 – *Bar graph showing the detection of unrecognized sleep-disordered breathing in hospitalized patients after implementation of a hospital sleep medicine service. Bars on the right side indicate percentage of patients with moderate to severe and mild sleep apnea in this group. (Reprinted with permission from Sharma et al.[23])*

untreated SDB, accommodation of PAP therapy in patients at high risk for SDB, and facilitating further outpatient workup and management of SDB also fall within the scope of hospital sleep medicine. The program further includes the evaluation and management of other sleep disorders including, but not limited to, insomnia, restless leg syndrome, and circadian rhythm disorders.

We consider this the missing link of a comprehensive sleep medicine program that is multidimensional (inpatient, outpatient, and sleep laboratory) and based on a team approach (sleep specialists, respiratory therapists, nurses, information technology professionals, discharge planners, ambulatory sleep clinics, and sleep centers). Our hospital's sleep medicine program identifies patients at high risk of SDB on entry into our system. Patients are educated about the disease process and how it impacts comorbid health conditions. Recommendations are provided regarding the appropriate screening test, PAP trials, mask fitting and acclamation, and coordination with care management in the discharge process. Furthermore, outpatient sleep studies are setup to confirm diagnosis and follow-up care.

Our Screening Protocol

The use of sleep questionnaires alone to screen patients for SDB in hospitalized patients have several limitations. First, sleep questionnaires (SQs) have not been validated in the hospital setting and do not work in patients with cardiovascular diseases.[34] Second, our clinical experience using SQs alone in hospitalized patients suggests poor patient reception of the information (because it was perceived as subjective) and subsequent low rates of attendance for ambulatory workup in these patients. We also found the SQs to be sensitive but not specific, resulting in high false-positive rates, which not only contributed to anxiety in patients, but also led to higher use of limited resources. Another downside of SQs in hospitalized individuals is the inability to characterize the severity of the disease. Based on available data, the adverse cardiovascular implications are associated mostly with moderate to severe OSA and not mild disease.[13,14] Therefore, the ability to classify the disease severity becomes extremely important for appropriate use of resources. However, in our experience, some use of screening questionnaires is necessary because we find that the discussion of overnight testing is far more intimidating to the patient than the prospect of filling out a questionnaire. In that regard, we find the use of a questionnaire as a kind of icebreaker to engage the patient in the discussion positively.

Given these limitations of SQs in hospitalized patients, Sharma et al[23] created a novel cost-effective screening model that encompasses both a subjective screening component and objective verification (Table 1). The two-tier model includes a screening in the electronic medical record and bedside assessment using the STOP (Snoring, Tiredness During Daytime, Observed Apnea, High BP)/STOP-BANG (Snoring, Tiredness During Daytime, Observed Apnea, High BP, BMI, Age, neck-collar size, gender) questionnaire.[35,36] A caveat to using BMI as a screening tool in individuals with CHF or cardiovascular accident (CVA) is that obesity is less clear a risk factor for OSA in these patients.[37,38] If the STOP/STOP-BANG questionnaire shows positive findings or clinical suspicion is high, this first-tier screening is followed by high-resolution pulse oximetry (HRPO) or a level III portable sleep monitor (PM), which provides objective data and classification of the disease severity.[39,40] The only exception is the cohort of patients admitted with acute heart failure, in whom an expanded questionnaire is used (STOP-BANG) and BMI is not an initial screening criteria owing to poor validation of sleep questionnaires in this cohort and presence of SDB in nonobese patients with CHF.[41,42] Given the significant improvements in heart failure outcomes that have been associated with our hospital sleep medicine program (discussed previously), we use the STOP-BANG questionnaire because it has been shown to have higher sensitivity than the STOP questionnaire for OSA screening.[43] Although this finding is based on outpatient data, this approach has been effective in our screening programs to date. We do not use the STOP-BANG questionnaire in every patient group because it becomes more cumbersome than simply asking questions (as with STOP), including measuring neck circumference and calculating the BMI. Given the large number of patients who are identified initially on entry into our system, applying the STOP-BANG questionnaire to all comers would be impractical and would limit the ability of our team to screen individuals. The optimal timing of the HRPO or PM is determined by the patient's clinical status. We typically use HRPO because of ease of placement, except for patients with CHF, stroke, or clinical suspicion of central sleep apnea. Table 2 reviews the relative contraindications to HRPO and PM based

TABLE 1] Description of Individual Components of SEAT-COM Protocol

Component	Description
Screening	Use of EMR-generated reports and using STOP/STOP-BANG questionnaire for initial assessment in appropriate patients. Explain significance of OSA.
Evaluation	Individuals with positive screening findings undergo HRPO or PM assessment. Reports are downloaded and prepared for review. Results and recommendations are made to the primary service.
Acclimatization	Education on OSA and treatment with PAP therapy. Appropriately introduce individuals to the PAP device and interface.
Treatment	Develop a plan with individuals to meet adherence guidelines for PAP therapy. Interrogate PAP devices to ensure therapy is optimized. Debrief and adjust PAP therapy based on individual's feedback.
Communications	Final recommendations communicated to members of the multidisciplinary team, including the discharge navigator, primary care team, sleep laboratory, and pulmonary/sleep team. Information is placed in an appropriate data base for QI and possible research purposes.

HRPO = high-resolution pulse oximetry; PAP = positive airway pressure; PM = portable sleep monitor; QI = quality improvement; SEAT-COM = Screening Evaluating Acclimatization Treatment and Communication Protocol; STOP = Snoring, Tiredness During Daytime, Observed Apnea, High BP; STOP-BANG = Snoring, Tiredness During Daytime, Observed Apnea, High BP, BMI, Age, neck-collar size, gender.

on our experience. This screening model has demonstrated a high positive predictive value when validated with the gold standard of polysomnography (PSG) in hospitalized patients with BMI of ≥ 30 kg/m^2.[23] The oxygen desaturation index (ODI), determined from HRPO, also showed high congruence with severity classification when compared with the apnea hypopnea index (AHI) assessed by PMs when the ODI definition was set as 4% desaturation.[40] The averaging time for HRPO was set at 2 s. Based on the described screening protocol, the team also found a high prevalence of undiagnosed SDB in obese hospitalized patients and patients admitted for acute heart failure.[32,39,40]

Defining the Sleep Consultation Team

In a tertiary care center, several stakeholders with expertise can contribute to the hospital sleep medicine program. The key to a successful multidisciplinary program is the close collaboration and partnership with cardiology (especially heart failure program), the stroke program, pulmonology, and intensive care physicians (intensivists). At our institution, the sleep medicine consultation team constitutes a board-certified sleep medicine specialist, advanced nurse practitioner, and a respiratory therapist.

TABLE 2] Contraindications to HRPO Screening in Hospital Sleep Medicine Program

- Oxygen requirement > 30% F_{IO_2} (≥ 3 L/min supplemental oxygen)
- Severe pain
- Reports of difficulty initiating or maintaining sleep (defined as < 2 h of continuous sleep)
- Alerted mental status or encephalopathy
- Anticipated sleep disruption during the night (imaging, testing, surgeries, etc.)

HRPO = high-resolution pulse oximetry.

The role of respiratory therapy deserves special mention, with the involvement of the hospital respiratory department being a vital component of the program. Respiratory therapists (RTs) frequently are the first to introduce patients to PAP therapy during hospitalization. Often, this introduction is in the setting of acute dyspnea, such as CHF or COPD exacerbation. RTs are very familiar with different methods of PAP therapy or noninvasive ventilation. Considering that patients with CHF, COPD, obesity hypoventilation syndrome, acute or chronic respiratory failure, or a combination thereof have a high prevalence of undetected SDB, RTs are in a unique position to suspect, screen, and optimize care for SDB. Evidence has shown that patients form and establish beliefs related to PAP therapy during the first 72 h of treatment.[32] As soon as the perception is negative, a cycle of noncompliance may begin. Thus, this initial introduction of PAP therapy by an RT to a patient is of critical long-term importance.

Rather than hiring a single person for this task, we opted instead to train a core team of three of our full-time senior therapists. Although one senior therapist is primarily responsible for the coordination of the entire team, all three share responsibility for screening patients, overnight HRPO and PM testing, device and mask acclimation, patient education, and data collection. When not participating in sleep assignment, they work a traditional assignment.

The ability to interact with the local hospital information technology team to formalize a pathway for

screening (daily list creation), electronic medical record documentation, and uploading of the screening, HRPO, and PM data also is an essential skill set. Interacting and educating floor nursing staff on nighttime testing and troubleshooting of the equipment, morning patient interviews to document quality of sleep, and unhooking of the HRPO or PM constitute other important elements of care delivery. The RT job also requires the ability to handle software to download data from these devices, create reports, document data, and disseminate information to stakeholders. Subsequent education, mask fitting, and PAP therapy acclamation are important follow-up components. RTs also participate in the multidisciplinary daily rounds with the pulmonary or sleep specialist. Additionally, they work with the care managers and our durable medical equipment companies to facilitate discharge and follow-up appointments.

Education also is provided for the entire respiratory department so that each RT understands the important role they play in the screening process for patients with undiagnosed SDB. Good communication and the transfer of essential information (so-called handoff) from the dayshift sleep RT to the night shift staff therapist is essential to successful patient compliance with therapy. Overall, the respiratory staff supports the program as they welcomed the opportunity to learn additional applications of therapy.

Components of a Hospital Sleep Medicine Program

Establishment of Program

Establishing any novel program requires significant multidisciplinary collaboration that starts with educating and involving key stakeholders in the program. Based on our experience, the following are essential to lay the foundation of the program.

Departments Required to Collaborate: Information technology, respiratory therapy, sleep, nursing, physicians, midlevel providers, and discharge planning.

Clearance Required: Executive administrator, committee levels (nursing, respiratory, and quality assurance).

Departments Requiring Education: Respiratory, pulmonary, hospitalist, cardiologists, neurologist, care management, durable medical equipment providers, and sleep center staff.

Other Key Personnel and Components to a Successful Program: (1) Physician champion and executive leadership, (2) educational sessions for the respiratory department on the science and risk factors for SDB, (3) core team of RTs who demonstrate competency in the Screening Evaluating Acclimatization Treatment and Communication Protocol (SEAT-COM) (Table 1), (4) sleep technologist at partnered sleep center to help facilitate expedited confirmatory studies on discharge, (5) educate RTs on the noninvasive technology available to identify patients at risk of SDB, (6) work with information technology to create a patient list daily for screening patients, (7) design educational material around referral to program, (8) design protocol and pathway for clinicians to navigate, and (9) establish physician relationships by educating on hospital sleep medicine programs during their monthly meetings.

SEAT-COM

The SEAT-COM comprises: (1) screening of patients with COPD, CHF, CVA, stroke, and obesity using Table 1; (2) educate and evaluate patients to identify need for HRPO or PM, (3) acclimation of PAP therapy for patients at high risk, (4) treatment adjustments based on residual AHI via auto CPAP device interrogation, and (5) communication and coordination with case management for discharge needs and communication and coordination with sleep laboratory for sleep study appointments and preauthorization.

Technology Used

The technology required includes the following.

1. HRPO Devices. These are different from regular overnight pulsimeters, which have averaging time of 10 to 16 s as default. HRPOs are biocalibrated to 2 s or less averaging time for high-resolution recording. Desaturation of 4% is required to define a respiratory event. Most current generation pulse oximeters have the capability to be biocalibrated to these standards, although some devices do not have the ability to detect motion and artifacts, which may result in overestimation of the signal. A rehearsal (or dry run) in a few patients with an HRPO or PM should be performed to ensure reproducibility. The signal can be fragmented and compromised severely when using clip pulse oximetry because it often dislodges. In our experience, a taped pulse oximeter may provide a more consistent signal. Ensure the finger selected has no artificial nails or dark nail polish.

2. Type III PM. A type III PM is required for signal confirmation and type of sleep apnea for patients with CHF and those with high pretest probability of central events (CVA, opioid use, etc).[44]
3. Software. Compatible software for HRPO (we use Profox [PROFOX Associates, Inc]) and PMs (ApneaLink, ResMed Inc) to download data recorded overnight.
4. Auto-CPAP, CPAP, and bilevel, bilevel spontaneous/timed, and AVAPS devices.
5. Data collection as appropriate for quality control and feedback.

Screening Protocol

Patients admitted to the cardiology, internal medicine, or family practice services with a BMI of $\geq$ 30 kg/m^2 are screened for SDB with the STOP questionnaire. In addition, patients admitted to the advanced heart failure service with the diagnosis of CHF are screened using the full STOP-BANG questionnaire. The STOP-BANG adds objective measures of BMI, age (> 50 years), neck collar size (> 40 cm), and gender (men are at higher risk). A trained RT administers the questionnaires. The STOP and STOP-BANG questionnaires are easy-to-use, succinct tools that can be administered by health care professionals with a minimal increase in work burden and also can be created in alignment with electronic medical records. The STOP-BANG questionnaire is administered to cardiology service patients because evidence suggests that patients with heart failure do not always exhibit excessive daytime sleepiness or tiredness.[41,45] The admitting team is notified if the STOP-BANG questionnaire results are positive (answering yes to two items or more in STOP and three items or more in STOP-BANG). The admitting team then has an option to consult the hospital sleep medicine program. A consultation by inpatient sleep services determines if the patient requires nocturnal HRPO. Contraindications for in-hospital HRPO are outlined in Table 2.

On high clinical suspicion of SDB (defined according to the Adult Obstructive Sleep Apnea Task Force of the American Academy of Sleep Medicine), patients are advised to undergo a confirmatory PSG after discharge.[44] In a case where a patient does not meet the current guidelines for in-laboratory PSG, an ambulatory HSAT is ordered after discharge to develop a diagnosis in an ambulatory setting. Because of logistic limitations, our current program does not screen patients admitted during the weekend. Using the hospital electronic medical records and patients' outpatient sleep center charts, a database of the STOP or STOP-BANG results and demographic and relevant clinical information are compiled and stored in a Health Insurance Portability and Accountability Act-compliant database.

Inpatient Treatment Protocol

A board-certified sleep physician reviews all overnight HRPO or PM tests performed. Patients with an ODI of $\geq$ 5, or significant oxygen desaturation, or both undergo a full comprehensive assessment including history and examination by an advanced practitioner provider and sleep specialist. After a comprehensive assessment that includes ODI and AHI and the degree of hypoxemia (Fig 2), further management is recommended. Our focus is on individuals whose screening results are positive for moderate to severe OSA with significant oxygen desaturation because intervention will have the greatest impact in this cohort (particularly in those with underlying cardiopulmonary disease).[13-15] Our own data support intervention during hospitalization, both in terms of clinical benefit and well as patient safety.[24-30] According to our protocol, patients with AHI or ODI of $\geq$ 15 are initiated on PAP therapy during the hospital stay. Treatment also may be considered in patients with ODI or AHI of 5 to 15 with significant oxygen desaturation [T(time) < 90% sats for more than 20 min] because hypoxemia in OSA has been shown to be an independent risk factor for time to death.[46] We use auto-CPAP for most patients except those with advanced or decompensated heart failure (ejection fraction < 40%) and hypercapnia, in whom we prefer fixed CPAP pressures with an upper limit of pressure of 10 cm H_2O.[25] Bilevel therapy is applied if a patient has concomitant COPD and hypercapnic respiratory failure or CPAP failure. All patients undergo a mask setup and acclimatization before the therapy is initiated (SEAT-COM protocol). If a patient's hypoxemia is out of proportion to the ODI (as determined by a sleep specialist), an overnight pulse oximetry is repeated with PAP therapy to consider additional oxygen therapy and clinical evaluation of hypoxemia. In the context of hospital sleep medicine, we define CPAP failure as the inability of a patient use PAP therapy despite education and acclimatization. In certain situations, such as logistics related to travel or severe disease, a patient may be discharged with a loaner auto-PAP device until therapy can be established. Automatic positive airway pressure (APAP) downloads are reviewed daily and laboratory tests (arterial blood gas or venous blood gas) are ordered at the discretion of the

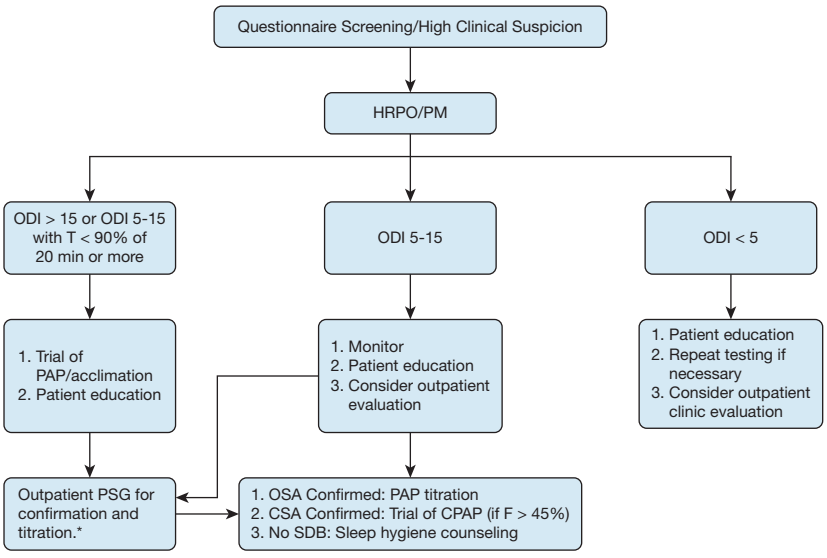


Figure 2 – *Flow chart showing evaluation and management of patients based on HRPO and PM results. [a]The vast majority of patients are not discharged with therapy. In select cases, the attending physician may elect to provide a loaned APAP device or to qualify a patient for a respiratory assist device (RAD) based on current RADs qualifying guidelines for COPD, hypoventilation, or neuromuscular disease at discharge (https://ww.cgsmedicare.com/pdf/dme_checklists/rad_e0471_2018re.pdf). APAP = automatic positive airway pressure; CSA = central sleep apnea; HRPO = high-resolution pulse oximetry; ODI = oxygen desaturation index; PAP = positive airway pressure; PM = portable sleep monitor; PSG = polysomnography.*

consulting sleep physician. If significant hypoxemia is observed (especially in patients with obesity hypoventilation syndrome or concomitant COPD), we conduct repeat overnight pulse oximetry with APAP to determine the need for additional oxygen, to select a range of pressure settings, or both. Appropriate interface changes are made in case of high leak. In case of emergent central apnea with APAP, we first try to narrow the pressure or settings or change to fixed CPAP with lower settings.

Individuals whose screening test shows negative results (ODI < 5) are not administered therapy. However, testing is repeated if clinical suspicion remains high (ie, suboptimal HRPO or PM signals or poor sleep). Furthermore, based on the sleep medicine team's assessment, these patients may be offered an outpatient sleep medicine clinic appointment or simply may be provided with education.

Limitations and Caveats

As with any evolving science, some limitations and caveats exist that readers should keep in mind. Most of the data supporting SDB screening and management in hospitalized patients are from observational or single studies. The few randomized control trials are small with limited numbers of participants.

ODI measured by HRPO with our current cutoff would likely miss events associated with a lesser degree of desaturation or arousals. Based on the data comparing ODI with AHI, ODI reveals underestimation of AHI, however, does not significantly impact the severity classification.[40] Some of this underestimation may be the result of missing events associated with arousal and a lesser degree of desaturation. HRPO also is not capable of distinguishing between OSA and central sleep apnea. For this reason, we suggest using PM in patients admitted with CHF or if underlying central sleep apnea in suspected.

Both HRPO and PM at our facility are used for screening and risk stratification only. This allows us to initiate therapy for high-risk patients during the hospital stay and to educate patients for ambulatory confirmation and treatment. If a patient is deemed a very high risk for a bad outcome (severe oxygen desaturations or marked hypercapnia in absence of PAP therapy), the patient is discharged with a loaner device that is maintained by our service. These loaner devices are returned or swapped by the patient after the patient undergoes confirmatory study after discharge. Our sleep center has a dedicated bed for urgent accommodation of patients within 72 h of hospital discharge.

Some practical hurdles encountered while developing a hospital SDB program need to be acknowledged. First, the types of PAP interfaces available for hospital use are quite limited. Xerostomia also can be a problem when trialing PAP therapy. Although our standard noninvasive ventilation machines have the ability to humidify the air, our PAP accommodations typically are completed with a nonhospital device. Based on our institutional guidelines, we are unable to use heated humidification during these PAP accommodation trials. Our general experience is that the PAP trial is well tolerated; however, patients are counseled that significant dryness may develop. Finally, patients who

struggle tolerating PAP therapy can be challenging. For patients who do not tolerate PAP therapy, a thorough bedside discussion is completed to identify the reason(s) for PAP intolerance. A common concern is claustrophobia related to using a full-face mask. Fortunately, our institution has purchased some nasal interfaces to address this problem. On occasion, our team also has borrowed higher-quality masks from the sleep center, which can address comfort issues as well as mask leak. Another common concern is related to the pressure of the CPAP device. Daily monitoring of pressure tolerance is undertaken by the RT, and appropriate adjustments by our therapists resolve most issues surrounding low or high pressure. Surgical and oral appliance options also are explored for those whom all of these measures fail; sleep medicine-certified ear, nose, and throat surgeons are part of a comprehensive sleep medicine program.

Conclusions

Hospital sleep medicine is a novel service line that addresses the need of early intervention of SDB in hospitalized patients with multiple comorbidities. Respiratory therapists play an integral role in initiation and maintenance of this service. Our data suggest this program positively influences important clinical end points, including a reduction in readmission rates, improved patient safety, and improved survival. The program also may have a potential for cost saving because of reduced hospital readmission, but this needs further evaluation.

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