

# Doing It Better for Less

## Incorporating OSA Management Into Alternative Payment Models



Neil Freedman, MD, FCCP

As the cost of health care continues to escalate, payers are adapting by moving away from models based on traditional fee-for-service reimbursement to models focused on rewarding care delivery that reduces costs and improves quality. These alternative payment models (APMs) are being introduced by government and commercial payers and will likely become the norm over time. Recent changes in sleep medicine related to advances in technology and approaches by payers for the management of OSA make this an appropriate time to incorporate the delivery of sleep medicine services into APMs. For OSA, the approaches that should lead to success include the appropriate use of home sleep apnea testing and automatic positive airway pressure; lower cost providers to manage less complex patients; evolving technologies including cloud-based positive airway pressure adherence monitoring, telemedicine, and Internet-based coaching to improve adherence with treatments; data analytics to better identify high-risk populations and to more appropriately allocate resources; and appropriate referrals of more complex cases to sleep specialists for management. All of these approaches should improve the value of care for payers, providers, and patients while allowing sleep specialists to more appropriately allocate their efforts to overseeing APM program development and administration and allowing them to focus on the management of more complicated patients.

CHEST 2019; 155(1):227-233

**KEY WORDS:** accountable care organizations; alternative payment models; home sleep apnea testing; obstructive sleep apnea; sleep medicine

It should come as no surprise to anyone in medicine that the delivery of health care and associated payment models in the United States is rapidly evolving. On the payer side, the main driver for payment reform is the escalating cost of care that is caused by several factors, including an aging population with more complex medical conditions, rising pharmaceutical prices, and

the use of advancing technologies.<sup>1</sup> Payers and businesses that subsidize the cost of health care for their employees have responded by reducing reimbursement and benefits, limiting choices, and shifting financial risk to providers and patients. These economic forces have driven the development of several new payment models that are focused on improving the value of

**ABBREVIATIONS:** ACO = Accountable Care Organization; APM = alternative payment model; CMS = Centers for Medicare and Medicaid Services; EMR = electronic medical record; HSAT = home sleep apnea testing; MIPS = Merit-based Incentive Payment System; NPP = nonphysician provider

**AFFILIATIONS:** From the Division of Pulmonary, Critical Care, Allergy and Immunology, Department of Medicine, Northshore University Health System, Evanston, IL.

**CORRESPONDENCE TO:** Neil Freedman, MD, FCCP, Division of Pulmonary, Critical Care, Allergy and Immunology, Department of Medicine, Northshore University Health System, 2650 Ridge Ave, Evanston, IL 60201; e-mail: [Neilfreedman@comcast.net](mailto:Neilfreedman@comcast.net)

Copyright © 2018 American College of Chest Physicians. Published by Elsevier Inc. All rights reserved.

**DOI:** <https://doi.org/10.1016/j.chest.2018.06.033>

care by reducing costs and improving the quality of care delivery.<sup>2</sup>

## New Payment Models and the Definition of Value

The Affordable Care Act initially set the stage for new payment models by encouraging the formation of Accountable Care Organizations (ACOs) in 2010. The Centers for Medicare and Medicaid Services (CMS) then set new targets for provider reimbursement in 2015 with an increasing portion of payments being tied to value or quality by 2018.<sup>3</sup> Also in 2015, the Medicare Access and CHIP Reauthorization Act was passed with CMS recently releasing the Quality Payment Program final rule in 2018.<sup>2</sup> Under the Quality Payment Program and Medicare Access and CHIP Reauthorization Act, CMS defined several new payment models including two broad tracks: the Merit-based Incentive Payment System (MIPS) and alternative payment models (APMs). These newer payment models deviate from traditional fee-for-service by associating incentive payments with metrics such as quality, reductions in costs, and patient satisfaction.

Although many physicians may be more familiar with MIPS, which is focused on measures related to individual physician performance, APMs incent groups of providers to better coordinate care for a group of patients. APMs can apply to a specific clinical condition, a care episode, or a population.<sup>4</sup> Some examples of APMs include Medical Shared Savings Program ACOs which focus on broad populations of patients, bundled payment programs focused on joint replacement, and disease-specific programs focused on patients with cancer and end-stage renal disease.<sup>4</sup> Commercial payers, both on their own and in partnership with CMS, have also been at the forefront of developing APMs as a method to reign in the cost of care.<sup>5,6</sup> APMs, regardless of the payer, span the financial risk spectrum from upside only risk (financial incentives for achieving predetermined outcomes) to newer programs with varying degrees of upside and downside risk (financial incentives and penalties, respectively, for achieving or not achieving outcomes).<sup>4,7,8</sup> To date, many APMs have demonstrated improvements in quality; however, the minority have demonstrated sufficient savings to qualify for additional reimbursement.<sup>9</sup> Better outcomes and cost savings are typically associated with ACOs which have been in existence for longer periods of time, reflecting the time required to redesign care delivery and implement infrastructure.<sup>9</sup> Interestingly, the most successful APMs in terms of the combined end points of

quality and cost savings have been smaller, physician-led groups.<sup>9</sup> Successful organizations typically have improved these end points by providing coordinated, standardized, evidence-based care focused on reducing hospitalizations, ED visits, postacute care stays, avoidable readmissions, and pharmaceutical costs.<sup>10</sup> In general, provider engagement and alignment, physician leadership, and systems-based decision analytics are also critical components to success.<sup>10,11</sup>

## Defining Value

Before we can discuss the specific approaches on how sleep medicine might be incorporated into a value-based system, we need to better understand how value is defined. Value is conventionally defined as quality divided by cost. However, the definition of value may differ depending on who is purchasing or experiencing the service. Although quality is part of the definition of value for most payers, most payers primarily define value based on cost reduction. Although patients and businesses are also focused on cost reduction, value to the patient and or their employers may also be defined in other ways.<sup>12</sup> Although cost and clinical quality are clearly important for patients, added benefits such as location, convenience, ease of use, and relationships with providers may be additional factors that sway their decisions about where they ultimately get their care. Businesses may also take into account lost employee productivity because of time away from work and employee satisfaction with their benefits when defining value as it relates to health-care spending. Approaches such as after-hour and weekend appointments and telemedicine services may offer extra value, driving patients and businesses to pay extra for these amenities. Therefore, different perceptions and definitions of value need to be appreciated when designing new care delivery models.

## Evolution of OSA Management and Value-Based Care

The delivery of sleep medicine services has already undergone several disruptive changes mostly related to new diagnostic and treatment technologies for the management of OSA.<sup>13,14</sup> Payers have adopted new reimbursement policies to support these services, leading clinicians to incorporate these management strategies into their practices. Therefore, it is the appropriate time to incorporate sleep medicine into APMs. Because OSA is one of the most prevalent and costly sleep disorders to manage on a population-based level, the remainder of this article will focus on how to transform the management of OSA within APMs.

## OSA

OSA is common, with clinically significant moderate to severe OSA affecting 10% to 13% of the adult population in the United States.<sup>15</sup> For those patients diagnosed with OSA, the annual cost of OSA management in the United States in 2015 was estimated to be \$12.5 billion.<sup>16</sup> Untreated, OSA can result in daytime sleepiness, neurocognitive deficits, motor vehicle accidents, and increased risk for cardiovascular diseases. Treatment for OSA has been consistently shown to improve daytime sleepiness and may reduce BP in a dose-dependent fashion.<sup>17-19</sup> Improvements in other health-care outcomes, especially in those patients without associated daytime symptoms and less severe disease, are more debatable.<sup>20,21</sup> From an APM standpoint, OSA management could lend itself to both bundled payment models for the initial diagnosis and treatment and population-based models for ongoing management of OSA as a chronic disease. Because there are currently no disease-specific APMs related to OSA or other sleep disorders, I would like to propose a framework for how OSA could be managed in a value-based system.

The following are the system-based components that would be critical to successfully incorporating OSA management into APMs.

### *Appropriate Use of Portable Testing and Automatic Positive Airway Pressure*

Multiple studies have demonstrated that an ambulatory approach using home sleep apnea testing (HSAT) and automatic positive airway pressure for the management of patients with uncomplicated OSA results in similar outcomes at reduced costs when compared with an approach using sleep laboratory-based management.<sup>22-26</sup> Commercial payers know the outcomes data and have increasingly incorporated this ambulatory approach into a strategy to reduce costs related to the management of OSA. Many sleep providers have not universally accepted this ambulatory approach, mostly related to reduced reimbursement for in-laboratory testing. It is my prediction that providers will embrace ambulatory management of OSA in the proper patient populations as payments transition to APMs and in-laboratory testing evolves from a profit center to a cost center.

In an ACO or other APMs, the sleep specialist will be responsible for the oversight and administration of the sleep program and manage those patients with more complex sleep disorders. Nonsleep specialists will initially manage patients who are deemed high risk for

moderate to severe uncomplicated OSA, with HSAT being distributed from peripheral sites outside of the sleep laboratory. In-laboratory testing will be reserved for those patients with more complex sleep disordered breathing problems and for appropriate patients with nonrespiratory sleep disorders.

### *Lower-Cost Providers*

Unfortunately, using HSAT and automatic positive airway pressure alone will not be enough to offset reductions in reimbursement; therefore, lower-cost providers will need to be incorporated into the patient care team. In reality, sleep specialists may not be required to manage most patients with uncomplicated OSA, and the literature suggests that adequately trained primary care physicians and nurses can manage these patients with some additional training.<sup>27-29</sup> For APMs that continue to have a fee-for-service component, incorporating nonphysician providers (NPPs) such as nurse practitioners and physician assistants into the care team would be appropriate. These providers are already used by approximately 40% of sleep medicine and primary care clinics, with NPPs caring for the full spectrum of sleep disorders.<sup>30</sup> For payment models geared more toward bundled or capitated payments, incorporating lower-cost team members such as respiratory therapists or nurses would make sense for managing patients with uncomplicated OSA after their initial diagnosis. As an example, respiratory therapists could perform initial and subsequent positive airway pressure visits for patients, both for routine patients and for those who are having difficulty with positive airway pressure therapy. These team-based approaches using several care providers already exist in the Veterans Affairs system and self-insured systems such as Kaiser Permanente. For these approaches to be successful in clinical practice, additional efforts will be required to better educate NPPs, primary care providers, and other team members. How these educational gaps will be addressed will be a challenge because most providers currently do not receive adequate training in the management of basic sleep-related problems.

### *Remote Monitoring of Treatment Outcomes*

Access to real-time data is another key to better manage patients. The technology to monitor positive airway pressure adherence remotely already exists and is available for most devices. Because adherence to positive airway pressure is currently linked to reimbursement and improved adherence is associated with better

outcomes, proactively monitoring adherence is a potential key to improving value. Limited data suggest that online adherence monitoring results in similar, and in some cases improved, adherence when compared with traditional face-to-face evaluations.<sup>31,32</sup> This approach could be achieved using current positive airway pressure adherence databases or these data could be incorporated into the clinician's electronic medical record (EMR), with nonphysician team members monitoring adherence on a routine basis. This approach could be optimized through appropriately used case management and improved partnerships with durable medical equipment providers.

### Telemedicine Encounters and the Use of Other Internet-Based Platforms

Real value for providers, patients, and businesses could be realized through the expanded use of telemedicine and other Internet-based services.<sup>33</sup> In our current fee-for-service model, patients have to take time off from work to visit with a provider to initially be evaluated for OSA and then follow up at least annually to evaluate their progress and adherence to therapy. For those patients who are doing well with their current therapy, the annual adherence visit may deliver little value because many visits are not associated with any meaningful changes in management.<sup>34</sup> This model results in lost time at work for patients, reduced productivity for their employers, and less space in a busy clinician's schedule to manage more complex patients.

In an APM, management via telemedicine visits presents an alternative way to deliver value to patients and providers. Unlike current fee-for-service models where telemedicine encounters are reimbursed only in a limited number of settings,<sup>35</sup> newer generation APMs and certain Medicare Advantage plans now reimburse providers for

telemedicine services.<sup>36</sup> Using a combination of face-to-face telemedicine encounters, cloud-based positive airway pressure adherence monitoring, and Internet-based communications and coaching, it is likely that many patients with uncomplicated OSA could be managed successfully outside of the office setting.<sup>37-40</sup> For those patients who are doing well with their positive airway pressure therapy or other treatments, a simple telemedicine visit or Internet-based communication could suffice, leaving more time for patients with more complex problems to be evaluated in an office setting.<sup>41</sup> Even in payment models that do not reimburse for telemedicine service, patients and employers may be willing to pay for these additional services to enhance employee productivity and satisfaction.

### Data Analytics and Population-Based Medicine

The appropriate use of data analytics will be another critical component for success.<sup>42</sup> By integrating information from the EMR and other sources, data analytics could be used to better identify high-risk patients who might benefit from testing. Because the routine screening of asymptomatic patients is currently not recommended,<sup>43,44</sup> data from the EMR and routine questionnaires could be used to identify patients who are overweight and obese with cardiovascular disease or risk factors and with symptoms of daytime sleepiness or fatigue. Additionally, integrating information from diagnostic testing and positive airway pressure adherence databases could allow providers and systems to more efficiently manage resources. As an example, data analytics and machine learning could phenotype certain patient groups based on demographics or comorbidities and help providers allocate resources to those patients who have more complex diseases while providing lower-cost care to patients who are doing well

**TABLE 1 ]** Quality Measures and Definitions as Defined by Merit-Based Incentive Payment System<sup>48</sup>

Quality Measure	Definition
Assessment for sleep apnea symptoms	Percentage of visits for patients $\geq 18$ y of age with a diagnosis of OSA that includes documentation of an assessment of sleep symptoms, including presence or absence of snoring and daytime sleepiness
Severity assessment at initial diagnosis	Percentage of patients $\geq 18$ y of age with a diagnosis of OSA who had an apnea hypopnea index or a respiratory disturbance index measured at the time of initial diagnosis
Positive airway pressure therapy prescribed	Percentage of patients $\geq 18$ y of age with a diagnosis of moderate or severe OSA who were prescribed positive airway pressure therapy
Assessment of adherence to positive airway pressure therapy	Percentage of visits for patients $\geq 18$ y of age with a diagnosis of OSA who were prescribed positive airway pressure therapy who had documentation that adherence to positive airway pressure therapy was objectively measured

**TABLE 2 ] Suggested Value Measures and Definitions**

Value Measure	Definition
Appropriate use of HSAT and APAP	Number of patients $\geq 18$ y of age with uncomplicated moderate to severe OSA (AHI $> 15$ ) managed with HSAT and APAP divided by number of patients $\geq 18$ y of age tested and treated for moderate to severe uncomplicated OSA
PAP adherence	Number of patients with moderate to severe uncomplicated OSA adherent with PAP therapy by standard criteria divided by all patients with moderate to severe uncomplicated OSA treated with PAP therapy
Annual cost of OSA treatment	Annual per patient cost of OSA management divided by all patients with a diagnosis of OSA
Patient satisfaction	Press Ganey or other validated measures divided by all patients treated for OSA

AHI = apnea hypopnea index; APAP = automatic positive airway pressure; HSAT = home sleep apnea testing; PAP = positive airway pressure.

and unlikely to benefit from the more resource intensive model of care. Instead of managing all patients in a similar fashion, data-driven decision-making should allow providers to better allocate resources, maintain or improve quality, reduce the cost of care, and improve value for payers, providers, and patients.

### Defining Meaningful Outcomes

The American Academy of Sleep Medicine has outlined quality metrics for several sleep disorders including the screening and management of OSA.<sup>45-47</sup> These metrics are focused on three areas including improving disease detection, improving quality of life, and reducing cardiovascular risk. CMS has also defined four MIPS-associated quality measures related to the management of OSA. These measures include the following: (1) assessment for sleep apnea symptoms, (2) severity assessment at initial diagnosis, (3) positive airway pressure therapy prescribed, and (4) assessment of adherence to positive airway pressure therapy (Table 1).<sup>48</sup> Both sets of measures are predominantly focused on diagnosis and providing appropriate treatment; however, neither of these sets of measures adequately assess the cost or value of care.<sup>9</sup> Unfortunately, outcomes data from Medicare ACOs have demonstrated that improved quality does not always translate into significant cost savings.<sup>9</sup> Because APMs reward improved quality and reduced costs, suggested value-based measures are outlined in Table 2. Improvements in cardiovascular outcomes were not included as a quality or value-based measure because the current data do not support consistent improvements in these areas. Therefore, measuring success in these areas might prove difficult.

One challenge to quality and value reporting is data collection. In any model of health-care delivery, metrics need to be easy to measure and meaningful for patients

and providers, while at the same time not overburdening providers with data collection during their patient encounters. Data related to these measures could be collected in several ways including through the use of standardized clinical documents, integrating positive airway pressure adherence and sleep study data into the EMR, or the use of other available platforms to collect and report the data. All of these approaches are currently available and should be achievable in an APM with associated data analytics capabilities.

### Conclusions

As payers shift reimbursement from traditional fee-for-service to value-based APMs, providers and health-care delivery systems will need to develop and rapidly adapt new strategies aimed at improving outcomes while reducing the cost of care. In these newer models, coordination of care with improved quality and efficiency will be valued more than the quantity of care that currently drives the traditional fee-for-service system. This will not be an easy transition for systems or providers because the costs of care related to employees, technology, and compliance continue to increase. Recent changes in technology related to the practice of sleep medicine should enhance our ability to effectively incorporate OSA management services into APMs. Successful APMs will be defined by team-based, coordinated efforts supported by data-driven decisions and evolving technologies. These approaches should allow APMs to provide better OSA outcomes at lower costs while enhancing the patient and provider experiences.

### Acknowledgments

**Financial/nonfinancial disclosures:** The author has reported to *CHEST* the following: N. F. is a medical advisor to Somnoware Healthcare Systems Inc, Santa Clara, California, and has not received financial compensation but has been awarded stock options for his services.

## References

1. Papanicolaos I, Woskie LR, Jha AK. Health care spending in the United States and other high-income countries. *JAMA*. 2018;319(10):1024-1039.
2. Centers for Medicare and Medicaid Services. Quality payment program year 2: Final rule overview. <https://www.cms.gov/Medicare/Quality-Payment-Program/Resource-Library/QPP-Year-2-Final-Rule-Fact-Sheet.pdf>.
3. Burwell SM. Setting value-based payment goals—HHS efforts to improve U.S. health care. *N Engl J Med*. 2015;372(10):897-899.
4. Centers for Medicare and Medicaid Services. APMs overview. 2018. [qpp.cms.gov](http://qpp.cms.gov). Accessed March 30, 2018.
5. Centers for Medicare and Medicaid Services. Quality payment program year 2 final rule: all-payer combination option and other payer advanced APMs. <https://www.cms.gov/Medicare/Quality-Payment-Program/Resource-Library/All-Payer-Combination-Option-and-Other-Payer-Advanced-APMs.pdf>. Accessed March 31, 2018.
6. Aetna. Perspective: Accountable care models can lead to long-term sustainable improvements in health care. <https://news.aetna.com/2014/09/accountable-care-models-can-lead-long-term-sustainable-improvements-health-care-2/>. Accessed March 22, 2018.
7. Centers for Medicare and Medicaid Services. CMS welcomes new and renewing Medicare Shared Savings Program ACOs. <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/2017-MSSP-Fact-Sheet.pdf>. Accessed March 19, 2018.
8. Nussbaum S, McClellan M, Metlay G. Principles for a framework for alternative payment models. *JAMA*. 2018;319(7):653-654.
9. Saunders R, Muhlestein D, McClellan M. Medicare accountable care organization results for 2016: Seeing improvement, transformation takes time, Vol 2018. Bethesda, MD: Health Affairs; 2017.
10. Bodanken B, Bankowitz R, Ferris T, et al. Sustainable success in accountable care. Washington, DC: National Academy of Sciences; 2016.
11. Muhlestein D, de Lisle K, Merrill T. Assessing provider partnerships for accountable care organizations. *Managed Care*. 2018;27(3):40-49.
12. Lanning M, Michaels E. A business is a value delivery system. *McKinsey Staff Paper*; 1988:1-16.
13. Freedman N. Counterpoint: Does laboratory polysomnography yield better outcomes than home sleep testing? No. *Chest*. 2015;148(2):308-310.
14. Parish J, Freedman N, Manaker S. Evolution in reimbursement for sleep studies and sleep centers. *Chest*. 2015;147(3):600-606.
15. Peppard PE, Young T, Barnet JH, Palta M, Hagen EW, Hla KM. Increased prevalence of sleep-disordered breathing in adults. *Am J Epidemiol*. 2013;177(9):1006-1014.
16. Watson NF. Health care savings: the economic value of diagnostic and therapeutic care for obstructive sleep apnea. *J Clin Sleep Med*. 2016;12(8):1075-1077.
17. Schein AS, Kerkhoff AC, Coronel CC, Plentz RD, Sbruzzi G. Continuous positive airway pressure reduces blood pressure in patients with obstructive sleep apnea: a systematic review and meta-analysis with 1000 patients. *J Hypertens*. 2014;32(9):1762-1773.
18. Yu J, Zhou Z, McEvoy RD, et al. Association of positive airway pressure with cardiovascular events and death in adults with sleep apnea: a systematic review and meta-analysis. *JAMA*. 2017;318(2):156-166.
19. Barbe F, Duran-Cantolla J, Sanchez-de-la-Torre M, et al. Effect of continuous positive airway pressure on the incidence of hypertension and cardiovascular events in nonsleepy patients with obstructive sleep apnea: a randomized controlled trial. *JAMA*. 2012;307(20):2161-2168.
20. Qaseem A, Dallas P, Owens DK, Starkey M, Holty JE, Shekelle P. Diagnosis of obstructive sleep apnea in adults: a clinical practice guideline from the American College of Physicians. *Ann Intern Med*. 2014;161(3):210-220.
21. Bratton DJ, Stradling JR, Barbe F, Kohler M. Effect of CPAP on blood pressure in patients with minimally symptomatic obstructive sleep apnoea: a meta-analysis using individual patient data from four randomised controlled trials. *Thorax*. 2014;69(12):1128-1135.
22. Rosen CL, Auckley D, Benca R, et al. A multisite randomized trial of portable sleep studies and positive airway pressure autotitration versus laboratory-based polysomnography for the diagnosis and treatment of obstructive sleep apnea: the HomePAP study. *Sleep*. 2012;35(6):757-767.
23. Berry RB, Sriram P. Auto-adjusting positive airway pressure treatment for sleep apnea diagnosed by home sleep testing. *J Clin Sleep Med*. 2014;10(12):1269-1275.
24. Kuna ST, Gurubhagavatula I, Maislin G, et al. Noninferiority of functional outcome in ambulatory management of obstructive sleep apnea. *Am J Respir Crit Care Med*. 2011;183(9):1238-1244.
25. Skomro RP, Gjevre J, Reid J, et al. Outcomes of home-based diagnosis and treatment of obstructive sleep apnea. *Chest*. 2010;138(2):257-263.
26. Berry RB, Hill G, Thompson L, McLaurin V. Portable monitoring and autotitration versus polysomnography for the diagnosis and treatment of sleep apnea. *Sleep*. 2008;31(10):1423-1431.
27. Chai-Coetzer CL, Antic NA, Rowland LS, et al. Primary care vs specialist sleep center management of obstructive sleep apnea and daytime sleepiness and quality of life: a randomized trial. *JAMA*. 2013;309(10):997-1004.
28. Antic NA, Buchan C, Esterman A, et al. A randomized controlled trial of nurse-led care for symptomatic moderate-severe obstructive sleep apnea. *Am J Respir Crit Care Med*. 2009;179(6):501-508.
29. Kunisaki KM, Greer N, Khalil W, et al. Provider types and outcomes in obstructive sleep apnea case finding and treatment: a systematic review. *Ann Intern Med*. 2018;168(3):195-202.
30. Colvin L, Cartwright A, Collop N, et al. Advanced practice registered nurses and physician assistants in sleep centers and clinics: a survey of current roles and educational background. *J Clin Sleep Med*. 2014;10(5):581-587.
31. Hwang D. Monitoring progress and adherence with positive airway pressure therapy for obstructive sleep apnea: the roles of telemedicine and mobile health applications. *Sleep Med Clin*. 2016;11(2):161-171.
32. Fox N, Hirsch-Allen AJ, Goodfellow E, et al. The impact of a telemedicine monitoring system on positive airway pressure adherence in patients with obstructive sleep apnea: a randomized controlled trial. *Sleep*. 2012;35(4):477-481.
33. Singh J, Badr MS, Diebert W, et al. American Academy of Sleep Medicine (AASM) position paper for the use of telemedicine for the diagnosis and treatment of sleep disorders. *J Clin Sleep Med*. 2015;11(10):1187-1198.
34. Nannapaneni S, Morgenthaler TI, Ramar K. Assessing and predicting the likelihood of interventions during routine annual follow-up visits for management of obstructive sleep. *J Clin Sleep Med*. 2014;10(8):919-924.
35. Centers for Medicare and Medicaid Services. Telehealth. <https://www.medicare.gov/coverage/telehealth.html>. Accessed March 19, 2018.
36. Centers for Medicare and Medicaid Services. Telehealth Services. <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/TelehealthSrvcsfctshst.pdf>. Accessed March 19, 2018.
37. Hoet F, Libert W, Sanida C, Van den Broecke S, Bruyneel AV, Bruyneel M. Telemonitoring in continuous positive airway pressure-treated patients improves delay to first intervention and early compliance: a randomized trial. *Sleep Med*. 2017;39:77-83.
38. Hwang D, Chang JW, Benjafield AV, et al. Effect of telemedicine education and telemonitoring on continuous positive airway pressure adherence. The Tele-O-SA Randomized Trial. *Am J Respir Crit Care Med*. 2018;197(1):117-126.
39. Munafo D, Hevener W, Crocker M, Willes L, Sridasome S, Muhsin M. A telehealth program for CPAP adherence reduces labor

and yields similar adherence and efficacy when compared to standard of care. *Sleep Breath*. 2016;20(2):777-785.

40. Sedkaoui K, Leseux L, Pontier S, et al. Efficiency of a phone coaching program on adherence to continuous positive airway pressure in sleep apnea hypopnea syndrome: a randomized trial. *BMC Pulm Med*. 2015;15:102.
41. He K, Palen BN, Mattox EA, Parsons EC. Veteran preferences regarding wireless management of positive airway pressure for obstructive sleep apnea at a tertiary health-care system. *Respir Care*. 2017;62(3):357-362.
42. Murphy B. Your ACO just took on downside risk. What's your data strategy. <https://www.beckershospitalreview.com/accountable-care-organizations/your-aco-just-took-on-downside-risk-what-s-your-data-strategy.html>. Accessed March 31, 2018.
43. Rosen IM, Kirsch DB, Chervin RD, et al. Clinical use of a home sleep apnea test: an American Academy of Sleep Medicine position statement. *J Clin Sleep Med*. 2017;13(10):1205-1207.
44. Jonas DE, Amick HR, Feltner C, et al; U.S. Preventive Services Task Force Evidence Syntheses, formerly Systematic Evidence Reviews. *Screening for Obstructive Sleep Apnea in Adults: An Evidence Review for the U.S. Preventive Services Task Force*. Rockville, MD: Agency for Healthcare Research and Quality; 2017.
45. Aurora RN, Collop NA, Jacobowitz O, Thomas SM, Quan SF, Aronsky AJ. Quality measures for the care of adult patients with obstructive sleep apnea. *J Clin Sleep Med*. 2015;11(3):357-383.
46. Morgenthaler TI, Aronsky AJ, Carden KA, Chervin RD, Thomas SM, Watson NF. Measurement of quality to improve care in sleep medicine. *J Clin Sleep Med*. 2015;11(3):279-291.
47. Aurora RN, Quan SF. Quality measure for screening for adult obstructive sleep apnea by primary care physicians. *J Clin Sleep Med*. 2016;12(8):1185-1187.
48. Centers for Medicare and Medicaid Services. Quality payment program: Quality measures. <https://qpp.cms.gov/mips/quality-measures>. Accessed March 24, 2018.