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Making the Most of Simplified Sleep Apnea Testing

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Clinical sleep medicine emerged as a subspecialty around expertise in performing and billing for laboratory-based polysomnography. With the obesity epidemic and increasing recognition of obstructive sleep apnea (OSA), billing for overnight polysomnography has been one of the fastest-growing charges for third-party payers. In response, there has been a push for adoption of home sleep testing (HST) to reduce costs (1). In addition, the development of autotitrating continuous positive airway pressure (CPAP) has removed the need for in-laboratory CPAP titration studies, further reducing costs.

Several randomized, controlled trials have shown that a strategy of HST and autotitrating CPAP is as effective as a laboratory-based strategy (2–6). However, these studies have focused on patients who had a high pretest probability of OSA, were diagnosed with moderate to severe disease, and were treated with CPAP only (2–6). On the basis of these trials, professional guidelines have recommended use of HST for OSA evaluation in patients with high pretest probability (7). No trial has evaluated the performance of a home-based diagnostic strategy in patients with low pretest probability for OSA or in selecting non-CPAP therapies (such as positional therapy or mandibular advancement devices) in patients with mild OSA. Despite this lack of data, in an effort to cut costs, a growing number of third-party payers have demanded use of HST as the initial diagnostic test for OSA in all patients, regardless of pretest probability (1).

In this setting, the work by Chai-Coetzer and colleagues provides welcome insights (8). The investigators randomly assigned a broad range of patients being evaluated for OSA and undergoing full polysomnography to have interpretations made based on full polysomnographic data, cardiorespiratory data only (to simulate HST), or oximetry and heart rate data only (to simulate overnight oximetry testing). All patients, including those diagnosed with mild OSA, simple snoring, or nonrespiratory disorders, were included in the outcomes analysis. This intention-to-treat design more closely reflects the real-world effect of replacing polysomnography with HST.

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It is reassuring that, in this broad range of patients, the authors found no difference in the distribution of initial diagnoses; clinician confidence in the diagnoses; or changes in diagnoses made after 4 months, when full data were made available for patients treated based on polysomnography versus HST-type data. Furthermore, there were no differences in CPAP compliance, daytime sleepiness, or quality of life between the groups. In fact, post hoc analyses suggested a trend toward better outcomes in patients diagnosed using HST-type data and treated with autotitrating CPAP than those diagnosed using full polysomnography and treated with fixed CPAP after in-laboratory CPAP titration. These results support the contention that a home-based diagnostic and treatment strategy leads to outcomes that are as good as, if not better than, those with a laboratory-based strategy, possibly due to improvements in time to treatment initiation.

In contrast, treatment decisions based on oximetry alone led to worse outcomes. The authors ascribe these outcomes to lower physician diagnostic confidence. This may reflect a lack of training in the use of oximetry, given that no professional society has developed standards for the scoring or reporting of overnight oximetry testing. Worse performance with overnight oximetry occurred primarily in patients with milder disease severity, with difficulty arising in distinguishing mild OSA from simple snoring. Physicians seemed to err on the side of being more aggressive with treatment in these milder cases. Chai-Coetzer and colleagues demonstrate that the oxygen desaturation index (ODI), derived from oximetry, performs well in predicting moderate to severe OSA, supporting the notion that oximetry alone can be used in this setting. Understanding the performance of the ODI in distinguishing mild OSA from simple snoring would be instructive because diagnostic difficulties were encountered in this area.

Some weaknesses of the study should be noted. Because all testing was done in a sleep laboratory, signal quality was likely better than it would have been with true HST. Further, the cardiovascular effect of treatment was not assessed; in fact, patients with active cardiovascular disease were excluded from the study. Given how frequently OSA coexists with cardiovascular disease, future studies need to include these patients to ensure clinical relevance.

Despite these limitations, Chai-Coetzer and colleagues have shown that it is reasonable to use HST in a broad range of patients being evaluated for OSA. This is welcome news to providers and other stakeholders interested in delivering cost-effective care. Furthermore, the lack of infrastructure required for HST allows for easy scalability to reduce long wait times for testing and expand access to underserved groups, such as rural populations and those without resources for transportation or overnight childcare.

Nevertheless, measures will need to be taken to ensure that care is delivered in an equitable and sustainable way. Economic modeling suggests that under current reimbursement policies, adoption of HST results in a negative operating margin for providers (9). Furthermore, many third-party payers have developed administrative barriers restricting access to both in-laboratory testing and HST, suggesting an underlying desire to reduce all sleep care, not just low-value care (1). In response to these financial pressures, sleep laboratories have minimized or eliminated technician time for patient education on OSA and

the application of HST equipment, likely reducing both diagnostic test performance and long-term adherence to OSA therapy. It will be of paramount importance for professional medical societies to work with payers and other stakeholders to ensure an economically viable strategy of replacing in-laboratory polysomnography with HST in the routine evaluation of OSA in order to provide high-value care for patients with this common disease.

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