Home-based Diagnosis of Obstructive Sleep Apnea in an Urban Population

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Study Objectives: Home-based diagnosis of obstructive sleep apnea (OSA) with portable monitoring (PM) is increasingly utilized, but remains understudied in underserved and minority populations. We tested the feasibility of home PM in an urban population at risk for OSA compared to in-laboratory polysomnography (PSG) and examined patient preference with respect to home PM versus PSG.

Methods: Randomized crossover study of home PM (WatchPAT200) and in-laboratory simultaneous PSG and PM in 75 urban African Americans with high pre-test probability of OSA, identified with the Berlin questionnaire.

Results: Fifty-seven of 75 participants were women, average age 45 ± 11 years (mean $\pm$ SD), 35% with $\leq$ high school education, and 76% with annual household income $< \$50,000$. Technical failure rates were 5.3% for home vs. 3.1% for in-laboratory PM. There was good agreement between apnea hypopnea index on PSG; AHI_{PSG} and AHI on home PM (mean $\pm$ 2 SD of the

differences = 0.64 ± 46.5 and intraclass correlation coefficient; ICC = 0.73). The areas under the curve for the receiver-operator characteristic curves for home PM were 0.90 for AHI_{PSG} ≥ 5 , 0.95 for AHI_{PSG} ≥ 10 , and 0.92 for AHI_{PSG} ≥ 15 . 62/75 (82%) participants preferred home over in-laboratory testing.

Conclusions: Home PM for diagnosis of OSA in a high risk urban population is feasible, accurate, and preferred by patients. As home PM may improve access to care, the cost-effectiveness of this diagnostic strategy for OSA should be examined in underserved urban and rural populations.

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The availability of many validated technologies and devices for portable monitoring (PM) has fueled the adoption of an out-of-center diagnostic model for obstructive sleep apnea (OSA) by many practitioners, healthcare systems, and health insurers.¹⁻³ The perceived advantages of home-based PM are time and resource efficiency and lower cost,^{4,6} making it a particularly attractive health service option for underserved urban and rural populations with suspected OSA and limited access to fully equipped sleep laboratories. Nevertheless, the feasibility of home PM in these populations remains understudied. This is important because home PM is associated with technical failure^{2,7} and false negative results,⁸ which will increase the demand for in-laboratory polysomnography ([PSG] gold standard test for diagnosis of OSA), potentially increasing the gap in availability of health services for OSA and may have a negative impact on the anticipated cost-effectiveness of home PM.

We examined the feasibility of home PM compared to in-laboratory PSG prospectively in an urban, largely underserved African American population. The specific objectives of this study were to: (1) determine accuracy of a validated PM device (WatchPAT200) used at home compared to PSG in diagnosing OSA, (2) compare technical failure rates of home PM in this population to those reported in other populations, and (3)

BRIEF SUMMARY

Current Knowledge/Study Rationale: This study was done to examine the feasibility and accuracy of home-based diagnostic testing in urban populations at risk for sleep apnea.

Study Impact: This study extends our knowledge of the applicability of home-based diagnostic testing for sleep apnea to urban underserved populations. The cost-effectiveness of this strategy needs to be further examined.

understand patient preferences with respect to setting of testing; home vs. in-laboratory.

METHODS

Participants

Adult African Americans, age ≥ 18 years at a single tertiary care center, with high risk for OSA (defined by the Berlin Questionnaire, $n = 75$) were recruited. The Berlin Questionnaire asks about snoring, daytime symptoms, high blood pressure, and body mass index (BMI).⁹ A positive response in 2 of 3 categories of questions is indicative of high risk for OSA and determined eligibility for enrollment. Participants were recruited from primary care and sleep medicine clinics. Exclusion

Figure 1—Research Protocol

criteria were: (1) past treatment of OSA (medical, dental, or surgical); (2) other primary sleep disorder(s) by history (restless legs syndrome, insomnia, shift work); (3) active uncontrolled medical conditions/immobility (congestive heart failure, severe COPD/asthma with frequent exacerbations in the preceding 6 months, uncontrolled seizure disorder, stroke within past 6 months, severe arthritis/deformity of fingers); (4) current drug (any non-prescription drug use besides over-the-counter drugs) or significant alcohol use (≥ 5 days per week); (5) no current residential address or contact phone number; (5) pregnancy; (6) current drug therapy short acting nitrates or alpha blockers; and (7) cardiac pacemaker. The last two were related to application limitations of the PM utilized—the WatchPAT200. A single ethnicity was chosen for the following reasons: (1) to improve sociodemographic homogeneity of the study population, (2) African Americans are the largest ethnic group served at our center, and (3) African Americans are at high risk for OSA and attendant cardiovascular morbidity.¹⁰ This study was approved by the University of Illinois at Chicago Institutional Review Board.

Protocol

Upon enrollment of eligible consenting participants, sociodemographic data was collected and the Epworth Sleepiness Scale (ESS), the Functional Outcomes of Sleep Questionnaire 10 (FOSQ10), history and physical examination, and urine pregnancy test (when applicable) were administered. Participants were randomized to a home PM test session or simultaneous in-laboratory PSG + PM test session (**Figure 1**). WatchPAT200 device (Itamar Medical Inc)¹¹ was used for both home and in-laboratory PM. In addition, participants were

asked to complete a 7-day sleep log following randomization. A brief training session was conducted the day before home test session in the sleep laboratory for each participant including watching a 10-min manufacturer provided instructional video on the application of WatchPAT200 and an up to 10-min question-answer session with a registered polysomnography technician (RPSGT) experienced in the application of WatchPAT200. The home and in-laboratory test sessions were performed within 4 days of each other by all participants. Participants completed a visual analog scale (0 = dissatisfied through 5 = completely satisfied) the morning after each test session and a 2-item questionnaire (administered by a research coordinator) after completion of both test sessions: (a) which test-session do you prefer (forced response for in-laboratory or home), and (b) why (open-ended)?

In-laboratory PM with WatchPAT200 was applied by an RPSGT concurrently with PSG channels. The RPSGT did not troubleshoot for PM technical problems such as PAT probe coming loose during PSG. A standard montage PSG was used, and participants were instrumented for electroencephalogram (F3/M2, F4/M1, C3/M2, C4/M1, O1/M2, O2/M1), bilateral electroculograms, electromyogram (submental, bilateral anterior tibial), electrocardiogram, oronasal airflow (thermistor and nasal pressure transducer), thoracoabdominal motion (piezo-crystal, EPM Systems), arterial oxygen saturation by pulse oximetry, and body position. All signals, including digital infrared video, were acquired, processed and stored using the ALICE5 digital systems (Phillips Respironics). The PSG was scored according to published criteria. Hypopneas were defined as $\geq 30\%$ reduction in airflow associated with $\geq 4\%$ oxygen desaturation.¹² Scoring was performed by a single RPSGT and board certified sleep medicine physician blinded to participant identity, randomization order, and test results from alternative tests (home and in-laboratory PM). WatchPAT200 data were downloaded and automated software scoring (zzzPAT, version 4.2.67.1a, Itamar Medical Ltd.) used for the apnea hypopnea index; AHI_{PM} was used as final outcome measure, to remain consistent with early validation studies.^{2,11,13,14} Specifically, a respiratory event was scored by the software if 1 of 3 criteria were met: (1) $\geq 30\%$ PAT amplitude reduction together with a pulse rate acceleration of 10%; (2) $\geq 30\%$ PAT amplitude reduction together with 3% oxyhemoglobin desaturation; or (3) $\geq 4\%$ oxyhemoglobin desaturation.¹⁵ To fulfill our goal of assessing the effectiveness of home PM in a manner simulating usual clinical practice, we focused our analyses on a single diagnostic parameter most commonly utilized by clinicians and by health insurers to define OSA, namely AHI. The data download was visually inspected by a board certified sleep physician (blinded to home vs. in-laboratory PM assignment) to make a determination of technical failure. PM tests where estimated total sleep time (TST) was ≤ 2 h, or PAT and oximetry data of interpretable quality did not meet published acceptable standards for minimum duration (≥ 4 h per recording) were deemed “technical failures.”^{14,16}

Statistical Analyses

The sample size calculation was performed for accuracy of home PM with WatchPAT200 vs. in-laboratory PSG by receiver operating characteristic (ROC) analyses using published methods implemented in the PASS program.¹⁷ The PSG area

under the curve (AUC) was assumed to be 0.99,¹⁸ and the AUC for home PM was targeted at 0.88 based on a previous report.¹⁹ Sixty participants provided a power of 90%, with α of 0.05. A combined dropout and technical failure rate of 20% was predicted, yielding a sample size of 75 participants. All participants completing the home PM test were analyzed regardless of the PSG determined apnea hypopnea index (AHI_{PSG}). Intra-individual agreement of home PM with PSG for AHI (AHI_{PM} and AHI_{PSG}) and of simultaneous in-laboratory PM with PSG for TST, sleep efficiency, and percent of TST in REM sleep were assessed with intraclass correlation; ICC estimated with a linear mixed model. Supplementary analysis for agreement of home PM with PSG was performed using the Bland-Altman (BA) approach.^{20,21} Sensitivity, specificity, the positive and negative predictive values (PPV and NPV), and the positive and negative likelihood ratios (LR) were calculated for home PM vs. PSG using AHI_{PSG} thresholds of 5/h, 10/h, and 15/h. A binormal ROC model was used for testing accuracy of PM with WatchPAT200 compared to PSG and a nonparametric approach was taken to account for correlated ROC curves.^{22,23} ROC curves were constructed for the same AHI_{PSG} thresholds as stated above.²⁴ In order to explore covariates in the model (potential clinical predictors of accuracy of home PM vs. PSG), a general regression methodology for ROC curve estimation was applied.²⁵ The VAS data were analyzed with paired t-tests after checking for normality, and patient preference for home-based vs. in-laboratory test were coded and reported as frequency. ROC analyses were performed with SAS version 9.2, and other analyses were performed with SPSS version 15 statistical software packages.

RESULTS

Participant Characteristics, Completion Rates, and Test Preference

Ninety-eight participants were screened, and 75 were enrolled (75% had 2 of 3 categories positive on the Berlin questionnaire). The majority of the participants were middle-aged women (**Table 1**). Approximately one-third did not have a high school diploma, and more than half were unemployed. All participants were adept at cell phone use, and majority had a working knowledge of computers (i.e., were familiar with technology use in daily living). The participants had an average of 2 previously diagnosed chronic comorbid medical conditions (physician diagnosis plus self-reported use of prescription medications), with a maximum of 7 comorbidities. The commonest comorbidity was hypertension (41/75).

Seventy-one percent of participants had OSA (AHI_{PSG} $\geq$ 5/h), with moderate-to-severe OSA in 55% of the participants. There was no order of test effect using the Grizzle model for cross-over design ($p = 0.18$). This clinical sample was sleepy (mean ESS = 12) and exhibited significant functional impairment (mean FOSQ10 = 13).²⁶⁻²⁹ Seventy-four participants completed in-laboratory test session, and 73 participants completed the home PM per protocol. Sleep and breathing parameters for participants across test sessions are noted in **Table 2**. In-laboratory WatchPAT200 performed simultaneously with polysomnography overestimated TST ($p < 0.0001$) and time below 90% oxygen saturation ($p = 0.0007$). Technical failure rates for

Table 1—Baseline characteristics (n = 75)

Parameter	Count (%)
Gender (women)	57 (76)
Employed	36 (48)
Education	
$\leq$ high school	26 (35)
$\geq$ 1 year of college	49 (65)
Household Income	
$< 50,000$	57 (76)
$\geq 50,000$	18 (24)
Daily Use of Technology	
Cell phone	75 (100)
Computer	59 (78)
Polysomnography Apnea Hypopnea Index	
< 5 per hour	22 (29)
5-15 per hour	12 (16)
> 15 per hour	41 (55)
Parameter	Mean $\pm$ SD
Age	44.7 $\pm$ 10.6
Epworth Sleepiness Scale	12.0 $\pm$ 5.5
Functional Outcome of Sleep Questionnaire 10	13.4 $\pm$ 3.8

home PM were higher than in-laboratory PM (5.3% vs. 3.1%, respectively). The participants indicated a high and equivalent level of satisfaction with both home and in-laboratory test sessions (VAS mean $\pm$ SD 4.28 $\pm$ 0.89 vs. 4.26 $\pm$ 0.94, respectively; $p = 0.5$). Sixty-two of 75 (82%) participants preferred home over in-laboratory testing; most frequent reasons cited were sleeping in your own bed (75%) and ease of use of the monitor (WatchPAT200; 32%). Participants indicating a preference for in-laboratory testing indicated primary reasons being presence of “trained staff” and acquiring “more information.”

Agreement of Portable Monitoring with Polysomnography

The ICC for AHI_{PSG} and home AHI_{PM} was 0.73 (95% CI 0.60-0.82), indicating good intra-individual agreement of home PM with PSG. BA plot for AHI_{PSG} and AHI_{PM} values for PSG and home PM is presented in **Figure 2**, where the mean difference was 0.64 and the limits of agreement were ± 46.5 , the correlation coefficient r was 0.37 with $p = 0.02$. Excluding the outlier (highlighted within **Figure 2** in orange box), the r was reduced to 0.23 ($p = 0.06$), indicating no significant trend for the discrepancy between AHI_{PSG} and AHI_{PM} to increase as the mean value (average of AHI_{PSG} and AHI_{PM}) increased. Similarly, there was good intra-individual agreement between simultaneous in-laboratory PM and PSG, with an ICC of 0.79 (95% CI 0.67-0.86) and the mean difference $\pm$ limits of agreement were 1.28 $\pm$ 46. The intra-individual agreement of AHI_{PM} derived from home and in-laboratory PM tests was good with ICC = 0.75 (95% CI 0.62-0.84).

However, we observed poor intra-individual agreement regarding sleep architecture assessment between simultaneous in-laboratory WatchPAT200 and PSG, as suggested by data presented in **Table 2**. The ICC's were fairly low for TST, sleep efficiency, and percent of TST in REM sleep (TST 0.28; 95% CI 0.04-0.49, sleep efficiency 0.54; 95% CI 0.34-0.69, and REM sleep 0.24; 95% CI 0.02-0.44).

Accuracy of Home Portable Monitoring

Table 3 presents the sensitivity, specificity, positive and negative predictive values, and the positive and negative likelihood ratios for home PM vs. PSG at AHI_{PSG} thresholds

Figure 2—Bland Altman Plot, Agreement of Home PM with PSG

PM, portable monitoring; AHI_{PM}, apnea hypopnea index on PM; PSG, polysomnography; AHI_{PSG}, apnea hypopnea index on PSG; red line indicates mean difference; green lines indicate limits of agreement (2 x standard deviation).

of ≥ 5 , ≥ 10 , and ≥ 15 per hour. While the sensitivity of home PM remained at ≥ 0.90 for all AHI_{PSG} thresholds considered, the specificity improved from 0.43 for AHI_{PSG} ≥ 5 to 0.77 at AHI ≥ 15 . The negative predictive values ranged from 82% to 88%, i.e., 10% to 20% of patients with a negative home PM test with WatchPAT200 might be diagnosed with OSA by PSG. For AHI_{PSG} threshold ≥ 5 , the positive likelihood ratio was 1.67. Based on our screening tool (Berlin Questionnaire), our estimated pre-test probability of OSA was 0.75-0.85.^{9,19} Therefore the estimated positive post-test probability, i.e., probability of OSA in those with positive home PM test with WatchPAT200 ranged from 0.83 to 0.91, similar to previous reports.³⁰ The positive likelihood ratio and the positive post-test probability for simultaneous in-lab PM with WatchPAT200 at AHI_{PSG} ≥ 5 were similar to home PM (1.70 and 0.83-0.91, respectively). The AUC values for home PM with WatchPAT200 ranged from 0.91 to 0.94, being the highest for AHI threshold ≥ 10 (**Figure 3**). The AUC for in-laboratory PM was 0.94 for AHI_{PSG} ≥ 5 and 0.96 for both AHI_{PSG} ≥ 10 and ≥ 15 . We tested age, gender, body mass index (BMI), OSA severity (defined by AHI_{PSG}), education, household income, and TST (based on home WatchPAT200 software scoring and sleep log) as potential predictors of AUC in the home PM ROC analyses, and none were found to be significant, likely due to lack of power. **Figure 4** illustrates the highest AUCs observed for home PM and in-laboratory PM with PSG comparisons at AHI_{PSG} ≥ 10 (AUCs = 0.94 and 0.96, respectively).

Table 2—Sleep and breathing parameters

	Polysomnography	In-laboratory PM	Home PM
Sleep Latency (minutes)	21.2 $\pm$ 21.4	21.6 $\pm$ 13.4	22.0 $\pm$ 20.6
Total Sleep Time (minutes)	320.3 $\pm$ 66.3	372.5 $\pm$ 88.8	376.8 $\pm$ 94.7
Sleep Efficiency (%)	78.9 $\pm$ 14.2	80.9 $\pm$ 11.4	80.1 $\pm$ 12.4
Supine sleep time (minutes)*	229.9 $\pm$ 118.8	—	—
Arousal Index*	24.6 $\pm$ 21.3	—	—
NREM 1 + 2 (%)**	61.8 $\pm$ 12.6	60.3 $\pm$ 9.4@	57.7 $\pm$ 9.2@
SWS (%)**	19.7 $\pm$ 10.6	21.3 $\pm$ 7.4 [§]	22.8 $\pm$ 10.1 [§]
REM (%)**	18.8 $\pm$ 7.1	20.2 $\pm$ 8.2 [#]	23.6 $\pm$ 8.2 [#]
AHI	30.3 $\pm$ 35.0	39.1 $\pm$ 29.1	32.4 $\pm$ 27.6
REM AHI	34.7 $\pm$ 30.4	41.4 $\pm$ 21.2	40.4 $\pm$ 26.9
Minimum oxygen saturation	79.4 $\pm$ 11.0	79.6 $\pm$ 9.5	79.7 $\pm$ 10.8
Time < 90% (minutes)	27.6 $\pm$ 49.4	45.2 $\pm$ 75.2	41.6 $\pm$ 83.5

Data expressed as mean $\pm$ standard deviation, all time measures are in minutes. PM, portable monitoring with WatchPAT200; SWS, slow wave sleep; AHI, apnea hypopnea index per hour; Time < 90%, total time with oxygen saturation below 90%. * WatchPAT200 did not provide these estimates. @ WatchPAT200 estimated *light sleep*. [§] WatchPAT200 estimated *deep sleep*. [#] WatchPAT200 estimated *REM sleep*. ** WatchPAT200 software scoring for estimated sleep times were generated for all sleep stage parameters in 58/75 participants. Data presented are on these participants only.

Table 3—Comparison of diagnostic accuracy of home portable monitoring with polysomnography

Criteria	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)	Positive LR (95% CI)	Negative LR (95% CI)
AHI _{PSG} ≥ 5 per hour	96 (85-99)	43 (22-66)	79 (66-89)	82 (48-98)	1.67 (1.15-2.44)	0.01 (0.02-0.42)
AHI _{PSG} ≥ 10 per hour	90 (77-97)	69 (48-86)	83 (69-92)	82 (60-95)	2.94 (1.64-5.28)	0.14 (0.05-0.36)
AHI _{PSG} ≥ 15 per hour	92 (79-98)	77 (58-90)	83 (69-93)	88 (70-98)	3.95 (2.05-7.60)	0.10 (0.03-0.31)

AHI_{PSG}, apnea hypopnea index on polysomnography; PPV, positive predictive value; NPV, negative predictive value; LR, likelihood ratio; CI, confidence interval.

Figure 3—Receiver operating characteristics

Receiver operating characteristic curves for home portable monitoring vs. polysomnography.

DISCUSSION

This study demonstrates the feasibility of home PM for diagnosis of OSA in an urban population with low socioeconomic status at high risk for OSA and that home testing is preferred over in-laboratory testing by these patients. The data failure rates and accuracy of home PM were similar to those previously reported in other populations.^{14,19} The wait times for OSA testing and treatment from the time of referral in the US ranges from a few weeks to more than a year depending on the health system³¹ and may be longer in underserved populations. Despite a higher risk of OSA and attendant comorbid complications, only a third of African Americans referred for sleep apnea assessment follow up on their physician's recommendation.³²

Figure 4—Home and Laboratory PM vs. PSG

PM, portable monitoring; Lab, in-laboratory; PSG, polysomnography; AUC, area under the curve.

A major barrier to OSA evaluation in this population is unfamiliarity with the testing (laboratory) environment.³³ This is consistent with our finding that most patients preferred home testing over in-laboratory testing due to familiarity with testing (home) environment. These findings improve our understanding of the applicability of home PM for diagnosis OSA by confirming its acceptability and feasibility in this population. Specifically, home testing may: (1) improve compliance with physician recommendation for sleep studies, (2) reduce delays in diagnosis by improving access, and (3) reduce cost of care.

We observed good agreement of home AHI_{PM} with AHI_{PSG} similar to previous validation studies, and after exclusion of one outlier, no significant trend for bias was noted on BA analyses.^{14,15,34} Nevertheless, the limits of agreement on BA plot were larger than previously reported.^{14,19,35} We chose to compare the agreement between PSG and WatchPAT200 derived index (i.e., AHI_{PSG} and AHI_{PM}) that are most likely to be used by clinicians to rule in or exclude a diagnosis of OSA. It is possible that other comparisons (for example, using alternate criteria for hypopnea on PSG and respiratory disturbance index or oxygen desaturation index from WatchPAT200) may narrow the limits of agreement (improve reliability), but these indices are not routinely used in clinical decision-making regarding institution of treatment or by health insurers for reimbursement of continuous positive airway pressure device treatment. In any event, the ideal definition of hypopnea remains elusive and can significantly alter the results of PSG, the "gold-standard."^{36,37} Therefore, we used one (Medicare) criterion for AHI_{PSG} and the automated software scored AHI_{PM} for our outcomes assessment.

Consistent with data from other populations, WatchPAT200 was accurate compared to PSG and performed similarly in the home and laboratory settings.³⁸ The discrimination between presence and absence of OSA (AUCs) defined by different AHI_{PSG} thresholds were comparable with home and in-laboratory PM and appears to be optimal $AHI_{PSG} \geq 10$, as has been previously reported.¹⁹ The observed ICC (0.75) in this study

for AHI_{PM} (home and in-laboratory PM) supports the notion of expected short-term intra-individual night-to-night variability in the expression of OSA as previously described.^{39,40} This may account for the marginal increase in AUC with simultaneous in-laboratory PM compared to home PM on a different night and may be deemed clinically insignificant. Technical failure rates were low (5%) with home PM in our study and compare favorably to suggested failure rates in a recent cost-effectiveness analysis of diagnostic health services models for OSA.⁴¹ Therefore, the comparative effectiveness of PM with WatchPAT200 compared to PSG appears to be optimal in the home vs. in-laboratory setting.

While the sensitivity of home PM was similar to previous reports, the poorer specificity suggests the accuracy of WatchPAT200 home PM for ruling in OSA in this population at AHI_{PSG} threshold ≥ 5 may be limited.^{14,19,35} This is important as it may lead to institution of unnecessary and expensive albeit safe treatment with positive airway pressure devices. This notion is further supported by a positive likelihood ratio in our study that is less than recommended and therefore a modest increase in positive pre-test to post-test probability of OSA with home PM.⁴² This limitation may be related to differential utility of the Berlin Questionnaire as a screening instrument in our population leading to inaccurate estimates of pre-test probability. The prevalence of OSA was lower in our study sample (68%) vs. pre-test estimates of 75% to 85% based on published data. In addition, our sample included those with known hypertension (54%), diabetes (24%), and peripheral neuropathy (8%), which may theoretically affect the results of WatchPAT200 with respect to assessment of significant respiratory events.¹¹ The specificity and positive likelihood ratio did improve by increasing the AHI_{PSG} threshold to ≥ 15 , without a decline in sensitivity. The utility of this strategy as a way to ensure appropriate institution of treatment should be examined for different subpopulations, for example, primary care vs. sleep clinic patients and symptomatic vs. asymptomatic patients. Other avenues to increase the specificity and positive likelihood ratio could be to test other screening questionnaires to identify an “at-risk” population and to examine other level 3 PM devices that use different technologies.⁴²⁻⁴⁴

We found poor intra-individual agreement of simultaneous WatchPAT200 and PSG on aggregate overnight sleep parameters, as has been reported previously.⁴⁵ WatchPAT200 relies on actigraphy for TST estimation, which may be limited in populations with OSA.⁴⁶ Epoch-by-epoch comparisons are reportedly superior,⁴⁷ but are not directly relevant to the diagnosis of OSA, and were not performed for this study.

The strengths of this study include a randomized design, focus on an underserved high-risk minority population, and a “real-world” effectiveness approach to evaluation of home PM. However, there are several limitations to be noted. A real challenge presented to clinicians by the increasing numbers and types of “validated” PM technologies is choosing the “right technology for the right patient.” This will depend not only on the technology itself and population/patient characteristics, but ideally will also include patient preference. Our patient population preferred home testing, which holds true for other populations of diverse sociocultural background.⁴⁸ Nevertheless, this pilot study does not address current knowledge gaps by directly

comparing the different technologies available for home PM⁴ to PSG with respect to diagnostic accuracy and data-failure rates. Prospective studies are needed to identify the technology and duration of home testing (single vs. multiple nights) that is cost-effective compared to PSG. In addition to underserved urban and rural populations, home PM can be advantageous in immobile/institutionalized patients, where it would be important to focus future comparative effectiveness research.

In summary, diagnosis of OSA with home PM is a feasible and acceptable alternative in this urban minority population. Focused prospective comparative effectiveness research on underserved and minority populations at high risk for OSA is needed to identify a cost-effective strategy for timely diagnosis and treatment of OSA.

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