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SPECIAL ARTICLES

Quality Measure for Screening for Adult Obstructive Sleep Apnea by Primary Care Physicians

Rashmi N. Aurora, MD, FAASM[1]; Stuart F. Quan, MD, FAASM[2,3]

[1]Johns Hopkins University, School of Medicine, Baltimore, MD; [2]Brigham and Women's Hospital and Harvard Medical School, Boston, MA; [3]University of Arizona College of Medicine, Tucson, AZ

Obstructive sleep apnea (OSA) is a highly prevalent condition which remains under-diagnosed and under-treated. Untreated OSA is associated with several chronic medical conditions, a reduction in quality of life and increases in health care costs. Therefore, early identification of undiagnosed cases is important. Implementation of a screening measure in a primary care environment for populations at high-risk for OSA could improve patient outcomes and reduce the health care burden of untreated OSA.

Keywords: quality measure, screening, sleep apnea, primary care

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INTRODUCTION

Obstructive sleep apnea (OSA) remains considerably under-diagnosed, with an estimated 75% to 80% of cases remaining unidentified.[1] Untreated OSA is associated with reduced quality of life, increased incidence of cardiovascular disease[2], insulin resistance and diabetes,[3,4] stroke,[5,6] and an increased risk of death.[7] In addition, the costs of untreated OSA are estimated to be a staggering $34 to $69 billion dollars per year.[8] The Centers for Disease Control and Prevention (CDC) partnered with two professional societies for sleep, the American Academy of Sleep Medicine and the Sleep Research Society, to create the National Healthy Sleep Awareness Project (NHSAP).[9] A key goal of this project was to develop a quality metric that would determine if appropriate risk assessment for OSA is being performed. Such a metric could be useful to healthcare organizations as they strive to improve the overall health of those they serve.

In the current paradigm of care, the primary care provider is in the best position to identify patients with symptoms of OSA, such as snoring, excessive daytime somnolence, and pauses in breathing. Identification by the primary care provider of patients who are high risk for OSA, followed by appropriate referral to a sleep specialist, could significantly reduce the frequency of undiagnosed OSA, improve the quality of life and health outcomes for these patients, and reduce both the individual and public health burden of untreated OSA. The following quality measure was developed to fill this gap.

METHODS

Literature Search

A comprehensive search was conducted in the PubMed database to identify any publications that addressed sleep apnea, screening, and common comorbidities using the following criteria:

a) apnea OR apnoea AND
b) (screening OR questionnaire OR risk OR predict*) AND
c) (obesity AND (risk OR prevalence)) OR congestive heart failure OR atrial fibrillation OR (treatment refractory hypertension OR hypertension) OR type 2 diabetes OR coronary artery disease OR stroke OR pulmonary hypertension OR (high-risk occupation OR high-risk occupation OR occupation OR public safety OR driving OR drive*) OR (bariatric surgery OR preoperative for bariatric surgery)

All searches were limited to guidelines, meta-analyses, and systematic reviews, articles pertaining to humans, and published in the English language. A total of 364 articles were retrieved for review using this search.

The titles and abstracts of all articles were reviewed by both a Workgroup member and AASM staff. Any disagreements were resolved by the second Workgroup member. Full articles of publications thought to be relevant were obtained and reviewed in full to identify and provide support for the drafted quality measures.

Development of the Measure

The Workgroup drafted the technical specifications of the measure, which include definitions of the numerator and denominator of the proposed measure, and any exclusions to the numerator or denominator. The Workgroup also provided a rationale for the measure, along with estimates of the strength of evidence supporting their choices, and gaps in the present state of care that might be assessed by measurement. Where possible, the Workgroup used descriptors characterized by Current

Procedural Terminology (CPT) codes to identify patients in the numerator and denominator.

Stakeholder Review

The AASM requested review and feedback from a variety of stakeholders who might either use or be impacted by the measure. This included sleep specialists, primary care providers, and other medical specialists. The Workgroup used stakeholder feedback to further revise the measure, where appropriate.

QUALITY MEASURE

The following are descriptions of the quality measure and any exceptions, the supporting rationale for developing the measure, and a brief discussion of issues that were addressed during development of the measure. The full technical description of the measure can be found in the supplemental material.

Description

This quality measure is used to report all patients aged 18 years and older at high risk for obstructive sleep apnea (OSA) with documentation of screening for OSA using an appropriate standardized tool at least every 12 months AND in whom a recommended follow-up plan is documented based upon the result of the screening. Patients at high risk for OSA are defined as follows: obesity (BMI $\geq$ 30 kg/m^2), congestive heart failure, atrial fibrillation, treatment resistant hypertension (blood pressure above goal despite adherence to antihypertensive regimen of 3 medications, or hypertension controlled by at least 4 medications), impaired glucose tolerance or type 2 diabetes, nocturnal dysrhythmias, stroke, pulmonary hypertension, preoperative for bariatric surgery, coronary artery disease.

Exceptions and Exception Justifications

The following are exceptions and justifications for excluding a patient from inclusion in reporting on this quality measure.

- **Medical Reasons:** Patient has tracheostomy; patient already has diagnosis of OSA
- **Patient Reasons:** Patient refuses OSA screening; patient does not come for periodic office visit within 12 months
- **System Reasons:** None

Supporting Evidence and Rationale

There is a high prevalence of OSA in a number of conditions such as hypertension, heart failure, coronary artery disease, stroke, and atrial fibrillation. [2,5,6] The prevalence of OSA is also high in patients with diabetes,[3,4] another known risk factor for cardiovascular disease. Given that cardiac disease remains the leading cause of morbidity and mortality in the United States, early identification of potential risk factors has value. Since treatment of OSA has been shown to improve cardiovascular outcomes, screening for OSA in known high-risk populations has merit.

There are several screening tools for OSA that are currently available. Specifically, there are a number of OSA-specific questionnaires that are relatively simple to administer, cost-effective, and have been validated. However, the use of a validated screening tool is only recommended for initial case identification. Sleepiness scales are typically not recommended to identify OSA as they are designed to screen for sleepiness from any cause and not specifically OSA-related sleepiness.

Relationship to Desired Outcome

To improve OSA detection, it is critical that all patients in high-risk groups be screened using a validated instrument for OSA. Clinical awareness will be increased by using such instruments in these high-risk groups. Positive screening is likely to result in confirmatory testing, increased disease identification, and treatment.

Opportunities for Improvement

It is well-recognized that OSA is an underdiagnosed disorder and this lack of disease recognition poses significant economical and public health burdens. Targeted screening in populations at high risk for OSA will have a substantial impact in reducing the burden of undiagnosed disease.

Issues Addressed during Development

There were 2 major concerns that were discussed by the Workgroup. First was whether screening should be universal or focused on a high-risk population. Factors which were considered in the final decision were the cost-benefit of universal vs. focused screening, the feasibility of performing the screening and the burden on the clinical practice. After considering the potential positive and negative impacts on clinical care, it was felt that screening should be limited to high-risk populations. Screening in these populations will identify undiagnosed patients with OSA, resulting in treatment and a positive impact on their underlying disease. The potential benefit clearly offsets the small extra burden on clinical practice and additional expense of confirmatory testing and treatment. Second, there was discussion of whether the definition of the high-risk population should include persons working in occupations such as commercial motor vehicle operators where sleepiness would be dangerous to themselves or others. A decision was made to exclude this group because the decision to screen in this population is one of public policy decision rather than medical practice.

IMPLEMENTATION STRATEGIES

Given the clinical and public health implications of untreated OSA, screening for OSA in high-risk populations has considerable merit. However, implementation and integration of OSA screening programs into clinical practice in a seamless and efficient manner is a challenge. Consideration should be given to screening high-risk individuals prior to the clinic visit to help streamline the process. Additionally, adoption of screening tools into the electronic health record (EHR) as well as training of medical support staff such as medical assistants, nurses, and clinic administrators to help administer screening questionnaires may also help facilitate practice transformation. Finally, a key component of successful execution of OSA screening is education of clinical healthcare staff and providers about the value and potential positive impact of OSA screening.

FUTURE DIRECTIONS

Early case identification of OSA is of significant value given the established associations between untreated OSA and a number of adverse health outcomes as previously described. Given that primary care providers frequently are the first point of direct medical care for most individuals, there is value in screening for OSA in the primary care setting. It is important to recognize that current screening protocols and high-risk subpopulations may evolve as new tools and research emerge. It is anticipated that over time, screening for OSA will become more effortless and assimilate into clinical practice in a similar manner as screening for other chronic diseases. Additionally, the hope is that early identification of OSA will result in mitigation of adverse cardiometabolic outcomes. However, long-term tracking and analyses are necessary to validate that expected outcomes are in fact being achieved.

Ultimately, this measure should be tested for validity and implementability. Long-term tracking and analyses are necessary to validate that expected outcomes are in fact being achieved.

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SUBMISSION & CORRESPONDENCE INFORMATION

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Address correspondence to: Rashmi N. Aurora, MD, Johns Hopkins University, School of Medicine, Baltimore, MD; Email: raurora2@jhmi.edu

DISCLOSURE STATEMENT

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Process Measure: Screening for Adult Obstructive Sleep Apnea

Measure Description	
Description	All patients aged 18 years and older at high risk for obstructive sleep apnea (OSA) with documentation of screening for OSA using an appropriate standardized tool at least every 12 months AND in whom a recommended follow-up plan is documented based upon the result of the screening
Type of Measure	Process

Measure Components	
Denominator Statement	All patients aged 18 years and older who are in the following high risk groups for OSA: obesity (BMI≥30 kg/m2), congestive heart failure, atrial fibrillation, treatment resistant hypertension (blood pressure above goal despite adherence to antihypertensive regimen of 3 medications, or hypertension controlled by at least 4 medications), impaired glucose tolerance or type 2 diabetes, nocturnal dysrhythmias, stroke, pulmonary hypertension, preoperative for bariatric surgery, coronary artery disease.
Exceptions	**Medical Reasons:** Patient has tracheostomy; patient already has diagnosis of OSA **Patient Reasons**: Patient refuses OSA screening; patient does not come for periodic office visit within 12 months **System Reasons:** None
Numerator	Patients with documentation of screening for obstructive sleep apnea using an appropriate standardized tool* at least every 12 months AND in whom a recommended follow-up plan is documented based upon the result of the screening. *Examples of these standardized tools include, but are not limited to, the Berlin questionnaire, sleep apnea clinical score (SACS), STOP, and STOP-BANG. Use of a tool that only screens for sleepiness, such as the Epworth Sleepiness Scale, is ***not*** appropriate.
Supporting Evidence/Rationale	Given that cardiac disease remains the leading cause of morbidity and mortality in the United States, early identification of potential risk factors has value. The prevalence of OSA in a number of conditions such as hypertension, heart failure, coronary artery disease, stroke, and atrial fibrillation is high. Additionally, the prevalence of OSA in diabetes, another known risk factor for cardiovascular disease is also high. Since treatment of OSA has been shown to improve cardiovascular outcomes, screening for OSA in known high risk populations has merit. Moreover, the noted association between motor vehicle accidents (MVA's) and OSA is a major public safety concern further highlighting the need for screening for OSA. There are several screening tools for OSA that are currently available. However, the use of a validated screening tool is recommended for initial case identification. Specifically, there are a number of OSA-specific questionnaires that are relatively simple to administer, cost-effective, and have been validated. Sleepiness scales are typically not recommended to identify OSA as they are designed to screen for sleepiness from any cause and not specifically OSA-related sleepiness.

Measure Importance	
Relationship to desired outcome	To improve disease detection, it is critical that all patients in high risk groups be screened using a validated instrument for OSAS. Clinical awareness will be increased by using such instruments in these high risk groups. This will result in confirmatory testing, increased disease identification, and ultimately treatment.
Opportunity for Improvement	It is well recognized that OSAS is an underdiagnosed disorder and this lack of disease recognition poses significant economical and public health burdens. Targeted screening in populations at high risk for OSAS will have a substantial impact in reducing the burden of undiagnosed disease.
Exception Justification	**Medical:** Patients who have a tracheostomy for whatever reason are already by virtue of that procedure treated for OSA. There is no clinical benefit to rescreen patients who already have been diagnosed with OSA. **Patient:** Screening cannot be done in patients who refuse or who do not return for scheduled office visits on a regular basis.
Harmonization with Existing Measures	Not applicable

Technical Specifications: Administrative/Claims Data	
Administrative claims data collection requires users to identify the eligible population (denominator) and numerator using codes recorded on claims or billing forms (electronic or paper). Users report a rate based on all patients in a given practice for whom data are available and who meet the eligible population/denominator criteria.	
Denominator **(Eligible Population)**	Patient is 18 years of age or older. **Accompanied by** Documentation that the patient has one of the following diagnoses that places them at high risk for OSA: **Obesity (BMI≥30 kg/m2)** *ICD-10* E66.0 Obesity, unspecified OR E66.01 Morbid (severe) obesity due to excess calories **Congestive heart failure** *ICD-10* I50.9 Heart failure, unspecified **Atrial fibrillation** *ICD-10* I48.2 Chronic atrial fibrillation **Treatment resistant hypertension** Chart Review: ≥ 3 antihypertensives including a diuretic and a BP ≥140/90 for the overall population and ≥130/90 for diabetics per JNC7 and ASH/ISH 2014 guidelines OR ≥ 4 antihypertensives including a diuretic and a BP <140/90 for the overall population and <130/90 for diabetics per JNC7 and ASH/ISH 2014 guidelines **Type 2 diabetes** *ICD-10* E11.9 Type 2 diabetes mellitus without complications

	Impaired glucose tolerance *ICD-10* R73.09 Other abnormal glucose **Nocturnal dysrhythmias** *ICD-10* I47.2 Ventricular tachycardia I47.9 Paroxysmal tachycardia, unspecified I48.0 Paroxysmal atrial fibrillation I48.2 Chronic atrial fibrillation I48.3 Typical atrial flutter I48.4 Atypical atrial flutter I48.91 Unspecified atrial fibrillation I48.92 Unspecified atrial flutter I49.8 Other specified cardiac arrhythmias I49.9 Cardiac arrhythmia, unspecified Chart Review: Code must be accompanied by chart note that dysrhythmias are occurring at night. **Stroke** *ICD-10* I63.30 Cerebral infarction due to thrombosis of unspecified cerebral artery I63.311 Cerebral infarction due to thrombosis of right middle cerebral artery I63.312 Cerebral infarction due to thrombosis of left middle cerebral artery I63.319 Cerebral infarction due to thrombosis of unspecified middle cerebral artery I63.321 Cerebral infarction due to thrombosis of right anterior cerebral artery I63.322 Cerebral infarction due to thrombosis of left anterior cerebral artery I63.329 Cerebral infarction due to thrombosis of unspecified anterior cerebral artery I63.331 Cerebral infarction due to thrombosis of right posterior cerebral artery I63.332 Cerebral infarction due to thrombosis of left posterior cerebral artery I63.339 Cerebral infarction due to thrombosis of unspecified posterior cerebral artery I63.341 Cerebral infarction due to thrombosis of right cerebellar artery I63.342 Cerebral infarction due to thrombosis of left cerebellar artery I63.349 Cerebral infarction due to thrombosis of unspecified cerebellar artery I63.39 Cerebral infarction due to thrombosis of other cerebral artery I63.50 Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery I63.511 Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery I63.512 Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery I63.519 Cerebral infarction due to unspecified occlusion or stenosis of unspecified middle cerebral artery I63.521 Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery I63.522 Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery I62.529 Cerebral infarction due to unspecified occlusion or stenosis of unspecified anterior cerebral artery I63.531 Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery I63.532 Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery I63.539 Cerebral infarction due to unspecified occlusion or stenosis of unspecified posterior cerebral artery I63.541 Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery I63.542 Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery

	I63.549 Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebellar artery I63.59 Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery I63.8 Other cerebral infarction I63.9 Cerebral infarction, unspecified I66.01 Occlusion and stenosis of right middle cerebral artery I66.02 Occlusion and stenosis of left middle cerebral artery I66.03 Occlusion and stenosis of bilateral middle cerebral arteries I66.09 Occlusion and stenosis of unspecified middle cerebral artery I66.11 Occlusion and stenosis of right anterior cerebral artery I66.12 Occlusion and stenosis of left anterior cerebral artery I66.13 Occlusion and stenosis of bilateral anterior cerebral arteries I66.19 Occlusion and stenosis of unspecified anterior cerebral artery I66.21 Occlusion and stenosis of right posterior cerebral artery I66.22 Occlusion and stenosis of left posterior cerebral artery I66.23 Occlusion and stenosis of bilateral posterior cerebral arteries I66.29 Occlusion and stenosis of unspecified posterior cerebral artery I66.3 Occlusion and stenosis of cerebral arteries I66.8 Occlusion and stenosis of other cerebral arteries I66.9 Occlusion and stenosis of unspecified cerebral artery **Pulmonary hypertension** *ICD-10* I27.0 Primary pulmonary hypertension I27.9 Pulmonary heart disease, unspecified **Preoperative for bariatric surgery** Chart review **Coronary artery disease** *ICD-10* I25.10 Atherosclerotic heart disease of native coronary artery without angina pectoris I25.110 Atherosclerotic heart disease of native coronary artery with unstable angina pectoris I25.111 Atherosclerotic heart disease of native coronary artery with angina pectoris with documented spasm I25.118 Atherosclerotic heart disease of native coronary artery with other forms of angina pectoris I25.119 Atherosclerotic heart disease of native coronary artery with unspecified angina pectoris I25.5 Ischemic cardiomyopathy I25.6 Silent myocardial ischemia I25.700 Atherosclerosis of coronary artery bypass graft(s), unspecified, with unstable angina pectoris I25.701 Atherosclerosis of coronary artery bypass graft(s), unspecified, with angina pectoris with documented spasm I25.708 Atherosclerosis of coronary artery bypass graft(s), unspecified, with other forms of angina pectoris I25.709 Atherosclerosis of coronary artery bypass graft(s), unspecified, with unspecified angina pectoris I25.710 Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable angina pectoris I25.711 Atherosclerosis of autologous vein coronary artery bypass graft(s) with angina pectoris with documented spasm I25.718 Atherosclerosis of autologous vein coronary artery bypass graft(s) with other forms of angina pectoris I25.719 Atherosclerosis of autologous vein coronary artery bypass graft(s) with unspecified angina pectoris I25.720 Atherosclerosis of autologous artery coronary artery bypass graft(s) with unstable

	angina pectoris I25.721 Atherosclerosis of autologous artery coronary artery bypass graft(s) with angina pectoris with documented spasm I25.728 Atherosclerosis of autologous artery coronary artery bypass graft(s) with other forms of angina pectoris I25.729 Atherosclerosis of autologous artery coronary artery bypass graft(s) with unspecified angina pectoris I25.730 Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with unstable angina pectoris I25.731 Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with angina pectoris with documented spasm I25.738 Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with other forms of angina pectoris I25.739 Atherosclerosis of nonautologous biological coronary artery bypass graft(s) with unspecified angina pectoris I25.750 Atherosclerosis of native coronary artery of transplanted heart with unstable angina I25.751 Atherosclerosis of native coronary artery of transplanted heart with angina pectoris with documented spasm I25.758 Atherosclerosis of native coronary artery of transplanted heart with other forms of angina pectoris I25.759 Atherosclerosis of native coronary artery of transplanted heart with unspecified angina pectoris I25.760 Atherosclerosis of bypass graft of coronary artery of transplanted heart with unstable angina I25.761 Atherosclerosis of bypass graft of coronary artery of transplanted heart with angina pectoris with documented spasm I25.768 Atherosclerosis of bypass graft of coronary artery of transplanted heart with other forms of angina pectoris I25.769 Atherosclerosis of bypass graft of coronary artery of transplanted heart with unspecified angina pectoris I25.790 Atherosclerosis of other coronary artery bypass graft(s) with unstable angina pectoris I25.791 Atherosclerosis of other coronary artery bypass graft(s) with angina pectoris with documented spasm I25.798 Atherosclerosis of other coronary artery bypass graft(s) with other forms of angina pectoris I25.799 Atherosclerosis of other coronary artery bypass graft(s) with unspecified angina pectoris I25.810 Atherosclerosis of coronary artery bypass graft(s) without angina pectoris I25.811 Atherosclerosis of native coronary artery of transplanted heart without angina pectoris I25.812 Atherosclerosis of bypass graft of coronary artery of transplanted heart without angina pectoris I25.89 Other forms of chronic ischemic heart disease I25.9 Chronic ischemic heart disease, unspecified **OR** **Chart review indicates one of the following:** • Patient will be undergoing bariatric surgery **Accompanied by** One of the following patient encounter codes: 99201, 99202, 99203, 99204, 99205 (office/other outpatient services – new patient) 99212, 99213, 99214, 99215 (office/other outpatient services – established patient) 99241, 99242, 99243, 99244, 99245 (office consultations, non-Medicare only)

Exceptions	**At least one of the following is documented in the patient chart:** • Patient refuses OSA screening • Patient has tracheostomy **Tracheostomy** *ICD-10* Z93.0 Tracheostomy status • Patient already has a diagnosis of OSA 327.23 Obstructive sleep apnea (adult)(pediatric)
Numerator	**Chart review indicates all of the following:** • Documentation of screening for obstructive sleep apnea using an appropriate standardized tool* at least every 12 months *Examples of these standardized tools include, but are not limited to, the Berlin questionnaire, STOP, and STOP-BANG. Use of a tool that only screens for sleepiness, such as the Epworth Sleepiness Scale, is ***not*** appropriate • Documentation of a recommended follow-up plan based upon the result of the screening