Body System: Respiratory		
Session Topic: Pulmonary Function Testing		
Educational Format		**Faculty Expertise Required**
REQUIRED	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
OPTIONAL	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. Please describe your interest and plan for teaching a PBL on your proposal form.

Professional Practice Gap	**Learning Objective(s) that will close the gap and meet the need**	**Outcome Being Measured**
• Knowledge gaps with regard to appropriate diagnostic and treatment plans to help patients with long-term management of asthma, including pulmonary function tests (typically done through spirometry) and selection of effective short- and long-term medications. • Suboptimal spirometry performance frequently leads to high misclassification rates in the office setting • Spirometry is underutilized in newly diagnosed asthma patients • There is often poor adherence to clinical guidelines that include the use of spirometry • Office staff are often in need of educational workshops to improve their competence in the use of office spirometry	1. Establish protocols for notification of when guidelines recommend the use of pulmonary function testing to detect, confirm, and monitor obstructive airway diseases (e.g. asthma, COPD, dyspnea). 2. Instruct patients regarding proper pulmonary function testing technique. 3. Recognize the interpretation of spirometry-normal values, obstructive and restrictive physiology. 4. Evaluate training needs to administer spirometry tests and interpret and validate results in symptomatic patients.	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.

ACGME Core Competencies Addressed (select all that apply)				
X	Medical Knowledge		Patient Care	
	Interpersonal and Communication Skills		Practice-Based Learning and Improvement	
	Professionalism		Systems-Based Practice	

Faculty Instructional Goals

Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.

- Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations
- Facilitate learner engagement during the session
- Address related practice barriers to foster optimal patient management
- Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the References section below are a good place to start
    - Visit http://www.aafp.org/journals for additional resources
    - Visit http://familydoctor.org for patient education and resources
- Provide recommendations for establishing protocols for notification of when guidelines recommend the use of pulmonary function testing to detect, confirm, and monitor obstructive airway diseases (e.g. asthma, COPD, dyspnea).
- Provide strategies for instructing patients regarding proper pulmonary function testing technique.
- Provide strategies and recommendations effective interpretation of spirometry-normal values, obstructive and restrictive physiology.
- Provide strategies and resources for evaluating training needs of office staff to administer spirometry tests and interpret and validate results in symptomatic patients.

Needs Assessment

Pulmonary function testing, particularly spirometry, is commonly recommended to detect, confirm, and monitor obstructive airway diseases (e.g. asthma, COPD).[1] Studies suggest that the incorporation of spirometry testing into family medicine practices can led to spirometry testing with acceptable levels of technical quality and concordant interpretation and if often followed by management changes for almost half of the patients.[2]

Spirometry, the primary method of pulmonary function testing, can be used to detect, monitor and manage patients who have COPD and other lung disorders. Technological advancements have made spirometry more reliable and easier to incorporate into a routine office visit.[3]

American Academy of Family Physicians (AAFP) Practice Profile data indicates that 66% of family physicians conduct spirometry tests in practice. However, of those who do not, 47% say

that it is "not desired" and 23% say they lack the necessary training.[4] In recent AAFP CME Needs Assessment surveys on medical skills and medical procedures, family physicians identified a need for continuing medical education and skills training with regard to performing pulmonary function testing, specifically spirometry, and interpreting the results.[5,6] CME outcomes data from previous AAFP Assembly sessions on asthma and COPD topics, confirm that physicians continue to have knowledge gaps with regard to pulmonary function testing.[7-9]

Continued education may allow some family physicians to find value in incorporating spirometry into their practice and best meeting the needs of their patients. Family physicians are encouraged to follow evidence-based guidelines in their use of spirometry, as the AAFP recommends against the use of spirometry to screen asymptomatic adults for COPD; however, a diagnosis of COPD should be considered in patients with unexplained respiratory symptoms, progressive dyspnea, chronic cough, increased sputum production with risk factors (e.g., smoking).[1,10,11]

A review of the literature indicates the following knowledge and practice gaps:

- Suboptimal spirometry performance is often unacceptable according to clinical guidelines, and frequently leads to high misclassification rates in the office setting[12-16]
- Spirometry is underutilized in newly diagnosed asthma patients[17,18]
- COPD is underdiagnosed in primary care, due to the underuse of spirometry[19,20]
- There is often poor adherence to clinical guidelines that include the use of spirometry[21,22]
- Office staff are often in need of educational workshops to improve their competence in the use of office spirometry[23]

In order to curb health-care costs and improve patient care, physicians should consider the following *Choosing Wisely* recommendation from the American Academy of Allergy, Asthma and Immunology (AAAI); American Thoracic Society (ATS); and the American College of Chest Physicians (ACCP):[1,24,25]

- Do not diagnose or manage asthma without spirometry.
- Do not perform frequent spirometry in patients with COPD in patients who are clinically stable and have an established diagnosis.
- Pulmonary function tests can be helpful in determining risk in cardiac surgery, but patients with no pulmonary disease are unlikely to benefit and do not justify testing. Symptoms attributed to cardiac disease that are respiratory in nature should be better characterized with pulmonary function tests.

Physicians may improve their use of spirometry in the office setting by engaging in continuing medical education that provides practical integration of current evidence-based guidelines and recommendations into their standards of care, including, but not limited to the following:[1,12,26,27]

- Physicians should use the Global Initiative for Chronic Obstructive Lung Disease criteria (FEV1/FVC ratio less than 70%) to diagnose obstructive lung disease in patients 65 years and older who have respiratory symptoms and are at risk of COPD (i.e., current or previous smoker).
- Physicians should use the American Thoracic Society criteria (FEV1/FVC ratio less than the lower limit of normal) to diagnose obstructive lung disease in patients younger than 65 years (regardless of smoking status) and in nonsmokers 65 years and older.

- If an obstructive defect is present, the physician should determine if it is reversible based on the increase in FEV1 or FVC after bronchodilator treatment (i.e., increase of more than 12% in patients five to 18 years of age, or more than 12% and more than 200 mL in adults).
- If pulmonary function test results are normal but the physician still suspects exercise- or allergen-induced asthma, bronchoprovocation (e.g., methacholine challenge, mannitol inhalation challenge, exercise testing) should be performed.
- Evaluation of children with chronic cough should include, at minimum, chest radiography and spirometry.
- In patients with dyspnea, spirometry should be performed to diagnose airflow obstruction.
- If the history or physical examination suggests asthma, clinical guidelines recommend pulmonary function testing.6 Spirometry is most accurate in children older than eight years and can detect reversible obstruction and hyperresponsiveness in the airways.
- In patients with dyspnea, spirometry should be performed to diagnose airflow obstruction.

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.

Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- A stepwise approach to the interpretation of pulmonary function tests[1]
- An approach to interpreting spirometry[3]
- Treatment of stable chronic obstructive pulmonary disease: the GOLD guidelines[11]
- Causes and evaluation of chronic dyspnea[12]
- Choosing wisely: adherence by physicians to recommended use of spirometry in the diagnosis and management of adult asthma[18]
- Evaluation of the patient with chronic cough[26]
- The diagnosis of wheezing in children[27]
- FamilyDoctor.org. Spirometry (patient education)[28]

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