American Geriatrics Society
Clinical Practice Committee

Guidelines Abstracted from the
"Global Initiative for Chronic Obstructive Lung Disease (GOLD)"
Initial Publication: 2001
Updates: 2003, 2004

On behalf of the AGS Clinical Practice Committee, the following author abstracted this guideline:

Matthew McNabney, MD

Assistant Professor of Medicine, Johns Hopkins University

Commentary provided by:

William J. Hall, MD

Director, Center for Healthy Aging, University of Rochester Medical Center

Address correspondence and reprint requests to:

Sara Reinthaler

American Geriatrics Society

The Empire State Building

350 Fifth Avenue, Suite 801

New York, NY 10118

Fax: 212-832-8646

info.amger@americangeriatrics.org.

Source:

This guideline abstract summarizes the contents Global Initiative for Chronic Obstructive Lung Disease Workshop Report: *Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease.* Electronic copies are available at http://www.goldcopd.com.

Objective:

To increase awareness of COPD and decrease morbidity and mortality from the disease. The guideline aims to improve prevention and management of COPD through a concerted worldwide effort of people involved in all facets of health care and health care policy. The guideline emphasizes strategies to reduce tobacco smoking and other risk factors for the disease as well as recommendations regarding optimal treatments for each stage of the disease.

Options:

Proper staging of the disease is essential and a four stage classification is used in this guideline. This classification (Stage 0 through 3) is determined by history and spirometry. Risk factor modification and therapy for airway obstruction are recommended based on this classification.

Outcomes:

Outcomes considered include prevention of disease progression, symptom relief, improved exercise tolerance, prevention and treatment of complications and

exacerbations, and reduction of mortality. These outcomes are a result of the underlying pathologic process of COPD, defined by GOLD consensus as: "A disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases".

Evidence:

Articles pertaining to COPD were identified through a search of the world's literature. Level of evidence was determined, according the criteria established by NHLBI (See Table). Selection of appropriate articles was done by GOLD panel members and completed in May 2000. All management decisions recommended by the panel were assigned a level of evidence as a basis for the decision. The methodological issues concerning the use of evidence from meta-analyses were carefully scrutinized.

Description of Levels of Evidence

Evidence Category	Sources of Evidence	Definition
A	Randomized controlled trials (RCTs). Rich body of data.	Evidence is from endpoints of well-designed RCTs that provide a consistent pattern of findings in the population for which the recommendation is made. Category A requires substantial numbers of studies involving substantial numbers of participants.
B	Randomized controlled trials	Evidence is from endpoints of

	(RCTs). Limited body of data.	intervention studies that include only a limited number of patients, posthoc or subgroup analysis of RCTs, or meta-analysis of RCTs. In general, Category B pertains when few randomized trials exist, they are small in size, they were undertaken in a population that differs from the target population of the recommendation, or the results are somewhat inconsistent.
C	Nonrandomized trials. Observational studies.	Evidence is from outcomes of uncontrolled or nonrandomized trials or from observational studies.
D	Panel Consensus Judgment.	This category is used only in cases where the provision of some guidance was deemed valuable but the clinical literature addressing the subject was deemed insufficient to justify placement in one of the other categories. The Panel Consensus is based on clinical experience or knowledge that does not meet the above-listed criteria.

Values:

The GOLD Report was not intended to be a comprehensive textbook on COPD, but rather to summarize the current state of the field.

The recommendations were created by the expert panel of the GOLD Initiative with input and comment from members of the American Thoracic Society and the European Respiratory Society. It is a worldwide initiative with focus on areas in the world with high prevalence of smoking and COPD.

Benefits, Harms, and Costs:

COPD causes significant morbidity and mortality and accounts for large direct and indirect monetary costs worldwide. There is good evidence that interventions to reduce risk factors (particularly smoking cessation) as recommended in this guideline are effective and cost-effective. Some treatments suggested in this guideline carry risk and potential harm to individual patients. However, in general, the benefits exceed the harms and are considered cost-effective

Recommendations:

Management of COPD is broken into 4 components.

1. **Assess and Monitor Disease**

   -Diagnosis is based on a history of exposure to risk factors and the presence of airflow limitation that is not fully reversible, with or without the presence of symptoms.

   -Patients who have chronic cough and sputum production with a history of exposure to risk factors should be tested for airflow limitation (spirometry) even if they do not have dyspnea.

   -For the diagnosis and assessment of COPD, spirometry is the gold standard.

FEV_1/FVC and a post-bronchodilator FEV_1 < 80% of predicted confirms the presence of airflow limitation that is not fully reversible.

-Health care workers involved in the diagnosis and management of COPD patients should have access to spirometry.

-Measurement of arterial blood gas tensions should be considered in all patients with FEV1 < 40% predicted or clinical signs suggestive of respiratory failure or right heart failure.

2. Reduce Risk Factors

-Reduction of total personal exposure to tobacco smoke, occupational dusts and chemicals, and indoor and outdoor air pollutants are important goals to prevent the onset and progression of COPD.

-Smoking cessation is the single most effective-and cost effective-way in most people to reduce the risk of developing COPD and stop its progression **(Evidence A).**

-Brief tobacco dependence counseling is effective **(Evidence A)** and every tobacco user should be offered at least this treatment at every visit to a health care provider.

-Three types of counseling are especially effective: practical counseling, social support as part of treatment, and social support arranged outside of treatment **(Evidence A).**

-Several effective pharmacotherapies for tobacco dependence are available **(Evidence A),** and at least one of these medications should be added to counseling if necessary and in the absence of contraindications**..**

-Progression of many occupationally induced respiratory disorders can be reduced or controlled through a variety of strategies aimed at reducing the burden of inhaled particles and gases **(Evidence B**).

3. Manage Stable COPD

-Overall approach to managing COPD should be characterized by a stepwise increase in treatment, depending on the severity of the disease.

-Health education can play a role in improving skills, ability to cope with illness, and health status. It is effective in accomplishing certain goals, including smoking cessation **(Evidence A).**

-None of the existing medications for COPD has been shown to modify the long-term decline in lung function that is the hallmark of this disease **(Evidence A).** Therefore, pharmacotherapy is used to decrease symptoms and/or complications.

-Bronchodilator medications are central to the symptomatic management of COPD **(Evidence A).** They are given on an as needed basis or on a regular basis to prevent or reduce symptoms.

-The principal bronchodilator treatments are β-agonists, anticholinergics, theophylline and a combination of one or more of these drugs **(Evidence A).**

-Addition of regular treatment with inhaled glucocorticoids to bronchodilator treatment is appropriate for symptomatic COPD patients with an FEV_1 <50% predicted and repeated exacerbations. (Evidence A)

Regular treatment with long-acting bronchodilators is more effective and convenient than treatment with short-acting bronchodilators but more expensive (Evidence A).

-Regular treatment with inhaled glucocorticosteroids should only be prescribed for symptomatic COPD patients with documented spirometric response to glucocorticosteroids or in those with an FEV1 < 50% predicted and repeated exacerbations requiring treatment with antibiotics or oral glucocorticosteroids **(Evidence B).**

-Chronic treatment with systemic glucocorticosteroids should be avoided because of unfavorable benefit-to-risk ration **(Evidence A).**

-All COPD patients benefit from exercise training programs, improving with respect to both exercise tolerance and symptoms of dyspnea and fatigue **(Evidence A).**

-Long-term administration of oxygen (>15 hours/day) to patients with chronic respiratory failure has been shown to increase survival **(Evidence A).**

4. Manage Exacerbations

-Exacerbations of respiratory symptoms requiring medical interventions are important clinical events in COPD.

-The most common causes of an exacerbation are infection of the tracheobronchial tree and air pollution, but the cause of about one-third of severe exacerbations cannot be identified **(Evidence B).**

-Inhaled bronchodilators (particularly inhaled β2-agonists and/or anticholinergics), theophylline, and systemic, preferably oral, glucocorticosteoids are effective treatments for acute exacerbations of COPD **(Evidence A).**

-Patients experiencing COPD exacerbations with clinical signs of airway infection may benefit from antibiotic treatment **(Evidence B).**

-Noninvasive intermittent positive pressure ventilation (NIPPV) in acute exacerbations improves blood gases and pH, reduces in-hospital mortality, decreases the need for invasive mechanical ventilation and intubation, and decreases the length of hospital stay **(Evidence A).**

Validation:

These guidelines were created by lung disease specialists from several countries. The committee received comment from the 2 leading chest medicine professional societies in the US and Europe. The continued revision and updating of this guideline is planned.

Sponsors:

Recommendations were developed by the "GOLD Workshop Staff" who represented several countries. It was sponsored by the National Heart Lung and Blood Institute and the World Health Organization.

Commentary:

As always, applying clinical guidelines in practice requires specific knowledge of a particular patient's needs and consummate medical judgment. To put these guidelines into perspective, the Clinical Practice Committee solicited the following commentary from Dr. William J. Hall, MD.

The Global Initiative for Chronic Obstructive Lung Disease (Gold) Initiative is an exceptionally ambitious international initiative designed to develop a world-wide standardization for the definition, classification, and management of Chronic Obstructive

Lung Disease (COPD) (1). In addition to the Guidelines abstracted in this issue (2), the Initiative has provided a variety of educational resources based on meticulous consensus conferences that adhere to strict principles of evidence-based medicine. On the GOLD web site http://www.goldcopd.org, various clinical guideline statements can be printed or downloaded to a PDA. The Initiative has an active program of professional and public education on virtually all continents.

There is abundant evidence that chronic lower respiratory disease is common in older adults. Overall, chronic lower respiratory disease remains the fourth leading cause of death among adults age 65 and over (3). COPD, in its various clinical forms, is relatively common in older adults and probably under diagnosed. For example, chronic bronchitis, defined as production of phlegm for at least three months for at least two years is present in about 15% of community dwelling adults age 65 and older (4). The presence of chronic bronchitis is associated with more acute respiratory infections and hospitalizations. In addition to being very common in older adults, chronic bronchitis has strong prognostic implications. In fact, this symptom complex of cough and phlegm production is associated with a 30% excess mortality over a ten-year period (4). Walke and associates found a particularly high symptom burden in community-dwelling older persons with advanced COPD (5). Participants with COPD had 71% more moderate or severe symptoms than did participants with advanced congestive heart failure. As is so often the case in geriatrics, the frequency and range of symptoms associated with COPD may be distinct from those experienced by younger patients. For example, predominate presenting symptoms such as limited activity, fatigue, and physical discomfort are almost

as prevalent as shortness of breath (5). Clearly more accurate diagnosis and targeted therapy are likely to benefit older adults with COPD.

Although the GOLD guidelines present excellent recommendations for almost all clinical aspects of COPD, the potential modifying effect of age on these recommendations is virtually absent throughout their various position papers. This omission is all the more surprising, since many of the expert panels included scientists and clinicians from Western European countries where the current proportion of older adults is even greater than the US. Since spirometry is proposed as the gold standard for diagnosis of obstructive airways disease, a clear understanding of age-related changes in lung function is essential. Unfortunately, we know considerably less about age-related physiologic changes in the respiratory system compared with other organs systems such as the cardiovascular or renal systems. Since lung function is closely linked to environmental influences, there are probably marked differences among continents and cultures. However, it has been established that normal aging may be associated with physiological changes that can be mistaken for intrinsic disease. Age-related loss of elastic tissue in lung parenchyma may lead to collapse of the airways during expiration resulting in pseudo-obstruction as measured by spirometry (7). Along with other tissue changes, this phenomenon has been labeled in the past as “senile emphysema” a term while perhaps repugnant to geriatricians tries to telegraph the message that this form of emphysema is not disease related. Recent analyses have begun to explore how age might alter the GOLD recommendations. GOLD utilized simple spirometry as the key diagnostic procedure to define stages of COPD. Such instrumentation is inexpensive, and available at most clinical settings, often including long term care facilities, where

geriatricians are likely to evaluate and care for older adults. The most recent GOLD recommendations define stage I COPD as airflow limitation where forced expiratory volume in one second/forced vital capacity (FEV1/FVC)% is <70% and FEV1 predicted is >80%. Stage 2 COPD has been defined as a FEV1/FVC% of <70% and an FEV1% predicted of <80%. These criteria are set irrespective of age (1). This trade-off with simplicity may lead to misclassification. The FEV1/FVC ratio falls with age, as does the FEV1 (6). Therefore any scale that does not correct for age will invariable over-diagnosis both the presence and severity of COPD in older adults cohorts. In a recent study form Norway, community-dwelling never-smokers with no current respiratory disease, dyspnea or comorbid illness were tested with spirometry. Approximately 35% of these healthy, older never-smokers had an FEV_1/FVC of <70% and would be classified as having Stage 1 COPD. This percentage increased with age and in those aged >80 years, 50% would be classified as having COPD and one-third would have an FEV_1 of <80% (Stage 2). Moreover, since the GOLD criteria for COPD are based on post-bronchodilator FEV_1, routine spirometry in older adults is likely to have an even higher rate of false positivity (8). It is not difficult to imagine a scenario where a 75-year-old woman with congestive heart failure might be diagnosed as having COPD by virtue of spirometry and be prescribed inhaled anticholinergic bronchodilators only to present later with confusion, incontinence, and no relief of her dyspnea, a scenario familiar to all geriatricians.

Therapeutic recommendations are also not age specific. The report includes the use of the new generation, long acting anticholinergic bronchodilator, tiotropium, as do other recent guidelines (9-10). This agent has achieved superior bronchodilatation and

greater improvement in quality of life compared to other classes of bronchodilators. Moreover, it requires only once-daily administration, and is not appreciably absorbed through the gastrointestinal system. Physiologically, the agent has key muscarinic receptor specificity that theoretically would be of advantage in older patients since it is known that muscarinic activity becomes relatively more important influence on airway tone than beta-receptor activity (11). Presently available clinical trials have not been done in cohorts of patients above age 66. The agent is mainly renally excreted, and the potential adverse anticholinergic effect of the agent in those older patients with substantial age related diminution in creatinine clearance is not known. In addition, the metered dose inhaler requires a high degree of manual dexterity. Potential drug-drug interactions are also not discussed.

How should we best utilize this guideline in the care of our older patients? First, we should be reminded that COPD is prevalent in older adults and often presents with a non-specific symptom complex. Secondly, spirometry remains the gold standard in diagnosing obstructive airway syndromes. Even if there is the potential for false-positives, a normal expiratory flow pattern virtually excludes the diagnosis of obstructive lung disease and prevents misclassification and errant treatment. This tool is available to all of us, and is underutilized in the care of older adults. Third, and most importantly, COPD is another example of the potential pitfalls of disease-specific guidelines for older patients with multiple conditions and complex pharmacological regimens (12).

Perhaps an equally important question is what does the field of geriatrics have to offer producers of guidelines? COPD is a perfect example of how powerful collaborative clinical research between disease sub-specialists and geriatricians can develop new

paradigms for approaching our older patients in what some have labels the post-disease era of medical decision making (13). Examples abound in respiratory disease. We have already mentioned the need for more precise metrics in the use of spirometry for diagnosis in older adults. Newer therapeutic agents potentially useful to our patients have yet to be evaluated in clinical trials targeting older adult, the age group with the most to gain from such therapeutic advances. Even our own cherished instrument, the geriatric functional assessment has yet to be utilized by all but a few academic pulmonologists (14). Many clinical scoring systems heavily weight age, irrespective of functional status, in determining prognosis. It has been recently demonstrated that functional state is an independent predictor for short- and long-term mortality in hospitalized patients older than 65 admitted with community-acquired pneumonia (15). It is likely that the same, or event greater predictive value will be found in patient with acute exacerbations of COPD. The widespread use of non-invasive positive pressure ventilation in treatment of acute respiratory failure is anything but non-invasive to an 80 year old. The key studies to determine its appropriate use have yet to be done.

It is likely that funding opportunities can be found for the creative academic geriatricians and their subspecialty colleagues in pulmonary medicine. Such collaborative clinical research is badly needed and geriatricians can make substantial contributions to new knowledge and better care of older adults with respiratory disease.

Acknowledgment:

Financial Disclosure(s): The abstracting author – Matthew McNabney, and the commentary author – William J. Hall have no financial support for research, consultantships, and speakers forum, as well as any company holdings.

Author Contributions:

Matthew McNabney reviewed extant expert/professional recommendations from the original set of guidelines and abstracted the specific recommendations that were relevant to the Geriatric population. Dr. McNabney drafted the abstracted guidelines and made minor revisions as requested by the AGS Clinical Practice Committee.

William J. Hall wrote and edited the commentary.

Sponsor's Role: There is no sponsor for this document.

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