Chronic Obstructive Pulmonary Disease (COPD) Diagnosis, Management and Prevention Information

CARE MANAGEMENT OF COPD

Chronic obstructive pulmonary disease (COPD) is a slowly progressive lung disease involving the airways and/or pulmonary parenchyma, resulting in a gradual loss of lung function. The symptoms of COPD range from chronic cough, sputum production, and wheezing to more severe symptoms, such as dyspnea, poor exercise tolerance, and signs or symptoms of right-sided heart failure. In the United States, COPD affects more than 5% of the adult population and is the 4th leading cause of death and the 12th leading cause of morbidity.

Chronic obstructive pulmonary disease (COPD) is a common respiratory condition involving the lungs and characterized by trouble breathing. It is sometimes also called emphysema. It affects more than 5 percent of the population and is associated with high rates for disability and death. It is the third-ranked cause of death in the United States, killing more than 120,000 individuals each year. As a consequence of its high prevalence and chronicity, COPD causes high resource utilization with frequent clinician office visits, frequent hospitalizations due to acute exacerbations, and the need for chronic therapy (e.g. supplemental oxygen therapy, medication).

What Causes COPD?

The most important risk factor for COPD is cigarette smoking and the amount and length of smoking contribute to disease severity (packs of cigarettes per day multiplied by the number of years). The exact threshold for the duration/intensity of cigarette smoking that will result in COPD varies from one individual to another. In the absence of a genetic/environmental/occupational predisposition, smoking less than 10 to 15 pack years of cigarettes is unlikely to result in COPD. On the other hand, the single best variable for predicting which adults will have airflow obstruction on spirometry is a history of more than 40 pack years of smoking.

Risk Factors of COPD

- Tobacco smoke (cigarette, pipe, cigar, and other types of tobacco).
- Prolonged exposure to occupational dusts and chemicals (vapors, irritants, and fumes).
- Indoor air pollution (biomass fuel used for heating and cooking in poorly vented dwellings).
- Outdoor air pollution (heat, ozone, and pollens).
- Factors that affect lung growth during gestation and childhood (e.g., low birth weight, respiratory infections).
- Genetic risk factor is a severe hereditary deficiency of alpha-1 antitrypsin.

Symptoms of COPD

Cough can be expected with COPD. Cough is a natural reaction of the airways to try and remove mucus or it can be a reaction to protect the airways from inhaled irritants.
Dyspnea, or shortness of breath, is a common symptom of COPD. Breathlessness is a feeling occurring when the lung changes from working in the way it was normally designed to work, to working differently. If the lung senses that it takes more work or effort to move air in and out of the lungs, a feeling of breathlessness will be experienced.

It is normal for the airways to produce several ounces of sputum a day. This mucus is needed to keep the breathing passages moist. When the lungs are bothered by irritants, they try to protect themselves by producing additional mucus to trap any inhaled particles from entering the lungs.

Like breathlessness, tiredness is an uncomfortable feeling. It is a common symptom in people with COPD. Tiredness is a feeling of loss of energy or stamina. Generally, breathlessness and tiredness go hand in hand and they are, for some people, difficult to tell apart.

### Stages of COPD

- **Stage I: Mild.** Individual may not be aware that his or her lung function is abnormal. Mild airflow limitation (FEV₁/FVC < 70%; FEV₁ ≥ 80% predicted) and sometimes, but not always, chronic cough and sputum production.

- **Stage II: Moderate.** Individuals typically seek medical attention because of chronic respiratory symptoms or an exacerbation of their disease. Worsening airflow limitation (FEV₁/FVC < 70%; 50% ≤ FEV₁ < 80% predicted) with shortness of breath typically developing on exertion.

- **Stage III: Severe.** Airflow limitation, greater shortness of breath, reduced exercise capacity, and repeated exacerbations which have an impact on patient's quality of life. Further worsening of airflow limitation (FEV₁/FVC < 70%; 30% ≤ FEV₁ < 50 % predicted), greater shortness of breath, and reduced exercise capacity is expected.

- **Stage IV: End Stage.** Quality of life is very appreciably impaired and exacerbations may be life-threatening. Severe airflow limitation (FEV₁/FVC < 70%; FEV₁ < 30% predicted) or FEV₁ < 50% predicted plus chronic respiratory failure. Patients may have Very Severe (Stage IV) COPD even if the FEV₁ > 30% predicted, whenever this complication is present.

### Spirometry is a Key Diagnostic Test

Spirometry is the gold standard for diagnosing COPD because it is the most standardized and reproducible measurement of airflow limitation. It measures the amount and speed at which a person can exhale after a deep breath. Symptomatic and asymptomatic patients suspected of having COPD should have spirometry performed to determine airway limitation and disease severity. Only one in three patients newly diagnosed with COPD receives a spirometry-based screening.

### Key Indicators for Considering a COPD Diagnosis

Consider COPD and perform spirometry if any of the following indicators are present in an individual over age 40:

- Dyspnea that is progressive, worse with exercise, persistent (present every day) and described by the patient as an “increased effort to breathe,” “heaviness,” “gassing”, etc.
- Chronic cough: may be intermittent and may be unproductive
- Chronic sputum production
- History of exposure to risk factors

Spirometry is a test that measures the amount and speed at which a person can exhale after a deep breath. Symptomatic and asymptomatic patients suspected of having COPD should have spirometry performed to determine airway limitation and disease severity. Spirometry is the gold standard for diagnosing COPD because it is the most standardized and reproducible measurement of airflow limitation. Only one in three patients newly diagnosed with COPD receives a spirometry-based screening (NCQA, 2014).

Note: The diagnosis should be confirmed by spirometry. When performing spirometry, measure Forced Vital Capacity (FVC) and Forced Expiratory Volume in one second (FEV₁). Calculate FEV₁/FVC ratio. Spirometric results are expressed as % Predicted using appropriate normal values for the person’s sex, age, and height.
Behavioral Health and COPD

- Intense anxiety can mimic a COPD exacerbation, and giving bronchodilators will worsen the anxiety.
- Physical symptoms such as loss of appetite and weight, trouble sleeping due to agitation, low energy, and poor concentration can be very responsive to antidepressant medications.
- Substance use disorders may be co-occurring as smoking (nicotine dependence) frequently is accompanied by alcohol use/dependence.
- Excessive worry can lead to demoralization, which is a persistent failure to cope with a chronic stressor. In one ER study, patients treated with an inhaler for asthma improved their rating of comfort, even when their oxygen saturation levels did not increase.

Components of Care: A COPD Management Program

**Component 1:** Assess and Monitor Disease
A detailed medical history of a new patient known or thought to have COPD should assess:

**Component 2:** Reduce Risk Factors
Smoking cessation reduces the decline in lung function that is associated with smoking, which decreases the likelihood that COPD will develop.

**Component 3:** Manage Stable COPD
Determine disease severity on an individual basis by taking into account the patient’s symptoms, airflow limitation, frequency and severity of exacerbations, complications, respiratory failure, comorbidities, and general health status.

**Component 4:** Manage Exacerbations
An exacerbation of COPD is defined by a change in the patient’s baseline dyspnea, cough, and/or sputum that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in treatment. 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.

**Integration of Care Management of COPD**

- Work toward smoking cessation if the member is still using tobacco.
- Ensure spirometry is current.
- Support use of maintenance medications including bronchodilators and systemic glucocorticoids.
- Co-manage anxiety and depression as they can exacerbate compliance with treatment and worsen somatic symptoms including breathing problems.

**DIFFERENTIAL DIAGNOSIS OF COPD**

**COPD:** Onset in mid-life; symptoms slowly progressive; long smoking history; dyspnea during exercise; largely irreversible airflow limitation.

**Asthma:** Onset early in life; symptoms vary from day to day; symptoms at night/early morning; allergy, rhinitis and/or eczema also present; family history of asthma; largely reversible airflow limitation.

**Congestive Heart Failure:** Fine basilar crackles on auscultation; chest X-ray shows dilated heart, pulmonary edema; pulmonary function tests indicate volume restriction, not airflow limitation.

**Bronchiectasis:** Large volumes of purulent sputum; commonly associated with bacterial infection; coarse crackles/clubbing on auscultation; chest X-ray/CT shows bronchial dilation, bronchial wall thickening.

**Tuberculosis:** Onset all ages; chest X-ray shows lung infiltration or nodular lesions; microbiological confirmation; high local prevalence of tuberculosis.

**Obliterative Bronchiolitis:** Onset in younger age; non-smokers; may have history of rheumatoid arthritis or fume exposure; CT on expiration shows hypodense areas.
Diffuse Panbronchiolitis: Most patients are male and nonsmokers; almost all have chronic sinusitis; chest X-ray and HRCT show diffuse small centrilobular nodular opacities and hyperinflation.

PROFESSIONAL ORGANIZATION RECOMMENDATIONS

The United States Preventive Services Task Force (USPSTF) recommends against screening adults for chronic obstructive pulmonary disease (COPD) using spirometry (Grade D). The recommendation is currently being updated. In addition, a new recommendation is due to be published by the USPSTF in 2016 titled Chronic Obstructive Pulmonary Disease: Screening Using Spirometry.1

In 2011, the American College of Physicians (ACP), the American College of Physicians, the American College of Chest Physicians (ACCP), the American Thoracic Society (ATS), and European Respiratory Society (ERS) issued a guideline for COPD that addresses the value of history and physical examination for predicting airflow obstruction; the value of spirometry for screening or diagnosis of COPD; and COPD management strategies (specifically evaluation of various inhaled therapies, pulmonary rehabilitation programs, and supplemental oxygen therapy).2

**Recommendation 1:** ACP, ACCP, ATS, and ERS recommend that spirometry should be obtained to diagnose airflow obstruction in patients with respiratory symptoms. It should not be used in individuals without respiratory symptoms.

**Recommendation 2:** For stable COPD patients with respiratory symptoms and FEV1 between 60% and 80% predicted, ACP, ACCP, ATS, and ERS suggest that treatment with inhaled bronchodilators may be used.

**Recommendation 3:** For stable COPD patients with respiratory symptoms and FEV1 <60% predicted, ACP, ACCP, ATS, and ERS recommend treatment with inhaled bronchodilators.

**Recommendation 4:** ACP, ACCP, ATS, and ERS recommend monotherapy using either long-acting inhaled anticholinergics or long-acting inhaled B-agonists for symptomatic patients with COPD and FEV1 <60% predicted. Clinicians should base the choice of specific monotherapy on patient preference, cost, and adverse effect profile.

**Recommendation 5:** ACP, ACCP, ATS, and ERS suggest that clinicians may administer combination inhaled therapies (long-acting inhaled anticholinergics, long-acting inhaled B-agonists, or inhaled corticosteroids) for symptomatic patients with stable COPD and FEV1 <60% predicted.

**Recommendation 6:** ACP, ACCP, ATS, and ERS recommend that clinicians should prescribe pulmonary rehabilitation for symptomatic patients with an FEV1 <50% predicted. Clinicians may consider pulmonary rehabilitation for symptomatic or exercise-limited patients with an FEV1 <50% predicted.

**Recommendation 7:** ACP, ACCP, ATS, and ERS recommend that clinicians should prescribe continuous oxygen therapy in patients with COPD who have severe resting hypoxemia (PaO2 ≤55 mm Hg or SpO2 ≤88%).

The Global Initiative for Chronic Obstructive Lung Disease3 issued an update in 2014 to their report, A Global Strategy for Diagnosis, Management, and Prevention of COPD. Highlights are included below; the full report can be accessed at [http://www.goldcopd.org/Guidelines/guidelines-resources.html](http://www.goldcopd.org/Guidelines/guidelines-resources.html).

**Component 1: Assess and Monitor Disease.** Include a detailed medical history of a new patient known or thought to have COPD. Assessment should include a thorough medical history including:

- Exposure to risk factors, including intensity and duration
- Past medical history, including asthma, allergy, sinusitis or nasal polyps, respiratory infections in childhood, and other respiratory diseases
- Family history of COPD or other chronic respiratory disease
- Pattern of symptom development
- History of exacerbations or previous hospitalizations for respiratory disorder
- Presence of comorbidities (e.g., heart disease, malignancies, osteoporosis, and musculoskeletal disorders)
- Appropriateness of current medical treatments
- Impact on patient’s life (e.g., decreased activity, missed work, effect on family routines, behavioral health)
- Social and family support available to the patient
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**Original Effective Date:** 4/2009  

### Component 2: Reduce Risk Factors

Possibilities for reducing risk factors include smoking prevention, reducing occupational exposures and avoiding indoor and outdoor air pollution. Smoking cessation is the most effective and cost-effective intervention to reduce the risk of developing COPD and slow its progression. Pharmacotherapy (nicotine replacement, bupropion/nortryptiline, and/or varenicline) is recommended when counseling is not sufficient.

### Component 3: Manage Stable COPD

Management of stable COPD should be guided by the following principles:

- Determine disease severity on an individual basis by taking into account symptoms, airflow limitation, frequency and severity of exacerbations, complications, respiratory failure, comorbidities, and general health status.
- Implement a stepwise treatment plan that reflects this assessment of disease severity.
- Choose treatments according to national and cultural preferences, the patient’s skills and preferences, and the local availability of medications.

*Patient education* can help improve skills, ability to cope with illness, and health status – it is effective in accomplishing smoking cessation, initiating discussions and understanding of advance directives and end-of-life issues, and improve responses to acute exacerbations.

*Pharmacologic treatment* can control and prevent symptoms, reduce the frequency and severity of exacerbations, improve health status and improve exercise tolerance. Pharmacologic treatment options include bronchodilators, glucocorticosteroids, vaccines, antibiotics, mucolytic (mucokinetic, mucoregulator) agents, and antitussives.

*Non-Pharmacologic Treatment* includes rehabilitation*, oxygen therapy, and surgical interventions. Rehabilitation programs should include, at a minimum: exercise training, nutrition counseling, and education. It may include oxygen therapy and surgical treatments.

**Note:** The minimum length of an effective rehabilitation program is six weeks. Benefit does wane after a rehabilitation program ends, but if exercise training is maintained at home the patient’s health status remains above pre-rehabilitation levels.

**Note:** There is no convincing evidence that mechanical ventilatory support has a role in the routine management of stable COPD.

### Component 4: Manage Exacerbations

An exacerbation of COPD is defined as an event in the natural course of the disease characterized by a change in the patient’s baseline dyspnea, cough, and/or sputum that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in regular medication in a patient with underlying 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. Severity of exacerbations should include arterial blood gas measurements (in hospital), chest X-ray & ECG, and other necessary laboratory tests. The patient should be educated on home management (e.g., bronchodilators and/or glucocorticosteroids). Antibiotics may also be prescribed.

Providers should be versed in identifying patients who should be hospitalized. Characteristics of patients may include:

- Marked increase in intensity of symptoms, such as sudden development of resting dyspnea
- Severe background COPD
- Onset of new physical signs (e.g., cyanosis, peripheral edema)
- Failure of exacerbation to respond to initial medical management
- Significant comorbidities
- Frequent exacerbations
- Newly occurring arrhythmias
- Diagnostic uncertainty
- Older age
- Insufficient home support

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HEDIS AND STAR MEASURES

CMS has not published a metric for COPD.

NCQA has published the following standard metrics related to COPD:

Use of Spirometry Testing in the Assessment and Diagnosis of COPD. Members 40 years of age and older with a new diagnosis of COPD or newly active COPD should receive appropriate spirometry testing to confirm the diagnosis.

In addition, NCQA published the following standard metric for smoking cessation for adults 18 years of age or older:

Medical assistance with smoking cessation. Current smokers who were seen by a practitioner during the measurement year and:
- Received advice to quit
- Cessation medications were recommended and discussed
- Cessation methods were recommended or discussed

RELATED CLINICAL PRACTICE GUIDELINES

In addition to the information contained in this document, please reference the following CPGs:
- Asthma (HS-1001)
- Smoking Cessation (HS-1035)

REFERENCES


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MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS

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