General

Guideline Title

Chronic obstructive pulmonary disease.

Bibliographic Source(s)

University of Michigan Health System. Chronic obstructive pulmonary disease. Ann Arbor (MI): University of Michigan Health System; 2017 Nov. 28 p. [99 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: University of Michigan Health System. Chronic obstructive pulmonary disease. Ann Arbor (MI): University of Michigan Health System; 2010 May. 17 p. [7 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

NEATS Assessment

National Guideline Clearinghouse (NGC) has assessed this guideline's adherence to standards of trustworthiness, derived from the Institute of Medicine's report Clinical Practice Guidelines We Can Trust.

 = Poor  = Fair  = Good  = Very Good  = Excellent

Assessment	Standard of Trustworthiness
YES	Disclosure of Guideline Funding Source
	Disclosure and Management of Financial Conflict of Interests
	Guideline Development Group Composition
YES	Multidisciplinary Group

YES	Methodologist Involvement
▮▯▯▯▯	Patient and Public Perspectives
	Use of a Systematic Review of Evidence
▮▮▮▮▮	Search Strategy
▮▮▮▮▮	Study Selection
▮▮▮▮▯	Synthesis of Evidence
	Evidence Foundations for and Rating Strength of Recommendations
▮▮▮▯▯	Grading the Quality or Strength of Evidence
▮▮▮▮▯	Benefits and Harms of Recommendations
▮▮▮▯▯	Evidence Summary Supporting Recommendations
▮▮▯▯▯	Rating the Strength of Recommendations
▮▮▮▯▯	Specific and Unambiguous Articulation of Recommendations
▮▯▯▯▯	External Review
▮▮▮▮▮	Updating

Recommendations

Major Recommendations

Note from the University of Michigan Health System (UMHS) and the National Guideline Clearinghouse (NGC): The following guidance was current as of November 2017. Because UMHS occasionally releases minor revisions to its guidance based on new information, users may wish to consult the original guideline document for the most current version.

Note from NGC: The following key points summarize the content of the guideline. Refer to the original guideline document for additional information.

The strength of recommendation (I-III) and levels of evidence (A-E) are defined at the end of the "Major Recommendations" field.

Key Points

Chronic obstructive pulmonary disease (COPD) is underdiagnosed and misdiagnosed. See Table 1 in the original guideline document for an overview of diagnosis and management of COPD.

Do not perform population-wide screening for COPD *[III-C]*.

Appropriate comprehensive treatment can improve symptoms and quality of life *[I-A]*.

Diagnosis

Consider COPD in any patient with dyspnea, chronic cough or sputum production *[I-C]*. Consider early diagnostic case finding in persons with a history of inhalation exposures known to be risk factors for COPD *[I-D]*.

Pulmonary function testing with post-bronchodilator assessment demonstrating a reduced forced expiratory volume in the first second/forced vital capacity (FEV_1/FVC) ratio is required for diagnosis *[I-C]*.

Assess COPD severity by determining extent of airflow limitation (spirometry), symptom severity, and exacerbation history (see Table 5 in the original guideline document) *[I-C]*.

Treatment

Smoking cessation is the single most important intervention to slow the rate of lung function decline, regardless of disease severity *[I-C]*.

Chronic medication management includes:

- Bronchodilators (beta-2 agonists and anticholinergics), selected based on symptoms and severity (see Figure 1 & Table 7 in the original guideline document), with the goal of improving symptoms and functioning and reducing exacerbations *[I-A]*.
- Inhaled corticosteroids – consider adding to bronchodilators for patients with frequent exacerbations despite bronchodilator therapy *[I-A]* or with features suggestive of asthma-COPD overlap *[II-D]*.
- Supplemental oxygen if resting oxygen saturation ≤88% or arterial partial pressure of oxygen (PaO_2) ≤ 55 mm Hg *[I-A]*.

Acute exacerbation medication management includes bronchodilators (beta-2 agonists and anticholinergics) *[I-C]*, systemic corticosteroid therapy *[I-A]*, and antibiotics *[II-A]* based on clinical indications (see Table 9 in the original guideline document). Empiric antibiotics are recommended for patients with increased sputum purulence plus either increased dyspnea or increased sputum volume *[I-A]*. Sputum culture is not routinely recommended *[III-D]*.

Pulmonary rehabilitation should be considered for all patients with functional impairment *[I-A]*.

Surgical and minimally invasive options include bullectomy, lung volume reduction procedures, and lung transplantation *[II-B]*. Life expectancy should be incorporated into shared decision making regarding the potential benefits of surgery *[II-D]*. Pulmonary consultation is recommended prior to consideration of invasive options *[I-D]*.

Palliative care should be discussed with patients with advanced COPD. Doing so may help limit unnecessary and burdensome personal and societal costs and invasive approaches *[I-C]*.

Definitions

Levels of Evidence

- Systematic reviews of randomized controlled trials
- Randomized controlled trials
- Systematic review of non-randomized controlled trials or observational studies, non-randomized controlled trials, group observation studies (e.g., cohort, cross-sectional, case-control)
- Individual observation studies (case study or case series)
- Opinion of expert panel

Strength of Recommendation

- Generally should be performed
- May be reasonable to perform
- Generally should not be performed

Clinical Algorithm(s)

An algorithm titled "Overview of COPD Management: Patient Education, Preventive Care, Pharmacologic Therapy, and Pulmonary Rehabilitation" is provided in the original guideline document.

Scope

Disease/Condition(s)

Chronic obstructive pulmonary disease (COPD)

Guideline Category

Diagnosis

Evaluation

Management

Prevention

Treatment

Clinical Specialty

Critical Care

Family Practice

Internal Medicine

Preventive Medicine

Pulmonary Medicine

Thoracic Surgery

Intended Users

Advanced Practice Nurses

Nurses

Occupational Therapists

Pharmacists

Physician Assistants

Physicians

Respiratory Care Practitioners

Guideline Objective(s)

- To provide a framework for management of chronic obstructive pulmonary disease (COPD) and for the

treatment of mild to moderate acute exacerbations
- To improve symptoms, quality of life and lung function while reducing morbidity and mortality for patients with COPD

Target Population

Adults with chronic obstructive pulmonary disease (COPD)

Interventions and Practices Considered

Diagnosis

Consideration of a diagnosis of chronic obstructive pulmonary disease (COPD) in patients with dyspnea, chronic cough, sputum production, or a history of inhalation exposures
Pulmonary function testing with post-bronchodilator assessment
Assessment of COPD severity

Treatment

Smoking cessation
Chronic and acute medication management
    Bronchodilators (beta-2-agonists and anticholinergics)
    Inhaled corticosteroids
    Systemic corticosteroids
    Supplemental oxygen
    Antibiotics
Pulmonary rehabilitation
Bullectomy
Lung volume reduction surgery
Lung transplantation
Palliative care

Major Outcomes Considered

- Predictive sensitivity/specificity of diagnostic tests
- Disease severity
- Disease progression
- Morbidity
- Mortality
- Quality of life
- Cost of treatment
- Adverse events of medication
- Pulmonary function

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search

The team began the search of literature by accepting the results of a systematic literature review performed in 2014:

> VA/DoD Clinical Practice Guideline for the Management of Chronic Obstructive Pulmonary Disease. The Management of Chronic Obstructive Pulmonary Disease Working Group, Department of Veterans Affairs and Department of Defense. Dec. 2014. (Searched literature from January 2005 through February 2014.) (See the "Availability of Companion Documents" field)

To update those results, they performed a systematic search of literature on Medline and in the Cochrane Database of Systematic Reviews for the time period 1/1/14–9/8/16.

The major search term was chronic obstructive pulmonary disease. The searches were for guidelines, controlled trials (including meta-analyses), and cohort studies, for literature on humans in the English language. Within these parameters individual searches were performed for the following topics:

> Etiology: smoking, particulate inhalation exposures, alpha-1 antitrypsin deficiency, life expectancy based on forced expiratory volume in the first second (FEV_1)/Body-mass index, airflow Obstruction, Dyspnea, and Exercise (BODE)
> Screening: questionnaires, pulmonary function testing/spirometry
> Diagnosis: History (risk factors, symptoms), physical exam
> Diagnostic studies: pulmonary function tests (PFTs), alpha-1 antitrypsin level, chest X-ray, 6-minute walk test, chest computed tomography (CT)
> Diagnostic classification: Global Initiative for Chronic Obstructive Lung Disease (GOLD) classes, Medical Research Council (MRC) or Modified Medical Research Council (mMRC) dyspnea scale, BODE index
> Definition and diagnosis: acute exacerbation
> Other diagnoses not included in C–F above
> Comorbid diseases (increased risk)
> Prevention: smoking cessation, vaccination (influenza, pneumococcus)
> Prevention: irritant avoidance
> Pharmacologic treatment: bronchodilators, inhaled corticosteroids
> Treatment: supplemental oxygen
> Treatment: pulmonary rehabilitation
> Nutrition
> Treatment: complementary and alternative medicine
> Treatment: mental health, psychosocial support
> Treatment: acute exacerbation – outpatient management, hospitalization
> Referral to pulmonary subspecialist
> Surgical treatment: lung volume reduction surgery, lung transplantation
> Treatment: follow up care, monitoring, chronic disease management
> Treatment: palliative care
> Other "treatments" not in I–U above
> Other not in A–V above

The search was conducted in components of a formal problem structure (outlined above). The search was supplemented with very recent clinical trials known to expert members of the panel. The search was a single cycle.

A more formal presentation of the inclusion and exclusion criteria, as well as the detailed search strategies, are presented in the methodological appendix (see the "Availability of Companion Documents"

field).

Literature Review and Assessment

Members of the guideline team reviewed the publications identified to be relevant to specific topics in order to select those with best evidence. Criteria to identify overall best evidence included relevance of the study setting and population, study design, sample size, measurement methods (variables, measures, data collection), intervention methods (appropriateness, execution), appropriateness of analyses, and clarity of description.

Beginning with best evidence identified by the VA/DoD systematic literature review, team members checked publications identified in the more recent search (1/1/14–9/8/16) to determine whether better evidence was available. Team members also had the option of considering very recent literature (published since 9/8/16) in determining whether even better evidence was available.

Number of Source Documents

The review process resulted in 56 studies identified as presenting best evidence on a topic by either the VA/DoD literature review or the review of more recent evidence.

The number of publications identified is presented in Section IV of the accompanying Literature Review Methods and Results (see the "Availability of Companion Documents" field).

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

Systematic reviews of randomized controlled trials
Randomized controlled trials
Systematic review of non-randomized controlled trials or observational studies, non-randomized controlled trials, group observation studies (e.g., cohort, cross-sectional, case-control)
Individual observation studies (case study or case series)
Opinion of expert panel

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The best evidence regarding specific topics was summarized in evidence tables listing articles, study designs, patient populations, main outcome variables, results, and notes regarding methodological issues and harms.

The process of review and assessment is described in more detail in the methods companion (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The guideline team reviewed the evidence and determined the importance of performing or not performing key aspects of care. In the absence of empirical evidence, the guideline team based recommendations on their expert opinion.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendation

Generally should be performed
May be reasonable to perform
Generally should not be performed

Cost Analysis

Cost-effectiveness of lung volume reduction surgery is not demonstrated for even the most favorable subgroup (i.e., chronic obstructive pulmonary disease [COPD] patients with upper lobe emphysema and reduced exercise capacity) unless outcomes are expected to remain favorable for 10 years.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

A draft of this guideline was reviewed in clinical conferences and by distribution for comment within departments and divisions of University of Michigan Health System (UMHS) to which the content is most relevant: Emergency Medicine, Family Medicine, General Medicine, Geriatric Medicine, Obstetrics & Gynecology (Women's Health), and Pulmonary & Critical Care Medicine. The draft was revised based on comments from these groups.

The final version of this guideline was endorsed by the Clinical Practice Committee of the University of Michigan Medical Group and by the Executive Committee for Clinical Affairs of the University of Michigan Hospitals and Health Centers.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Chronic obstructive pulmonary disease (COPD) is responsive to multiple treatments. Appropriate comprehensive treatment can improve patients' quality of life and prognosis.

Refer to the "Clinical Background and Rationale for Recommendations" section of the original guideline document for the benefits of specific interventions.

Potential Harms

Long-Acting Beta-2-Agonists (LABAs) and Anticholinergics

LABAs. A U.S. Food and Drug Administration (FDA) advisory panel recommended that LABAs not be used as single-agent therapy in asthma (see University of Michigan Health System [UMHS] Asthma guideline). However, for patients with chronic obstructive pulmonary disease (COPD), LABAs may still be used as single-agent therapy without an inhaled corticosteroid. While LABAs may increase blood pressure and heart rate, data for COPD patients from the TORCH study (a three-year trial in COPD patients of fluticasone propionate and salmeterol combination versus fluticasone alone, salmeterol alone, or placebo), found no increased risk of all-cause death or cardiovascular death in the salmeterol group. These data further underscore the importance of distinguishing asthma from COPD.

Anticholinergics. Anticholinergic drugs may worsen symptoms and signs associated with narrow-angle glaucoma, prostatic hyperplasia, or bladder-neck obstruction and should be used with caution in patients with any of these conditions. Concerns about cardiovascular effects have diminished. Initially a meta-analysis suggested that inhaled anticholinergics (ipratropium and tiotropium) were associated with significantly increased risk of cardiovascular death, myocardial infarction (MI), or stroke among patients with COPD. However, since then, data from the UPLIFT study (a four-year, placebo controlled trial of tiotropium) found no significant increase in MI or stroke in the tiotropium treated group.

Inhaled Glucocorticosteroids (ICS)

Withdrawal from treatment with ICS can lead to a short term increase in exacerbations in some patients.

An increase in the frequency of pneumonia has been reported in COPD patients using ICS, particularly in patients age 65 and older. The frequency of reported pneumonia appears to be approximately double in several studies comparing ICS/LABA combinations versus placebo in COPD. However, in the largest published mortality study in COPD, no increase in pulmonary related deaths was noted in the ICS/LABA combination therapy group as compared to placebo. In patients with COPD being treated with ICS, particularly those age 65 and older, consider the possible increased risk of pneumonia and maintain a lower threshold for considering a diagnosis of pneumonia when patients present with increased symptoms.

ICS may also increase a patient's risk for cataracts or glaucoma. Consider regular eye exams for patients using these medications. Patients using ICS should also be warned about the possibility of oral candidiasis and vocal changes. Rinsing the mouth after administration of ICS should be encouraged.

Decrease in bone density is a theoretical risk of this class of medication, but available long-term data suggest there is no meaningful association between ICS use and decreased bone mineral density in this patient population.

Qualifying Statements

Qualifying Statements

These guidelines should not be construed as including all proper methods of care or excluding other acceptable methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific clinical procedure or treatment must be made by the physician in light of the circumstances presented by the patient.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Audit Criteria/Indicators

Clinical Algorithm

Patient Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

End of Life Care

Getting Better

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2017 Nov

Guideline Developer(s)

University of Michigan Health System - Academic Institution

Source(s) of Funding

The development of this guideline was funded by University of Michigan Health System (UMHS).

Guideline Committee

Chronic Obstructive Pulmonary Disease (COPD) Guideline Team

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Financial Disclosures/Conflicts of Interest

University of Michigan Health System (UMHS) endorses the Standards of the Accreditation Council for Continuing Medical Education that the individuals who present educational activities disclose significant relationships with commercial companies whose products or services are discussed. Contributions of team members with relevant financial relationships are reviewed by team members without relevant financial relationships to assure the information is presented without bias.

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Guideline Status

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This guideline updates a previous version: University of Michigan Health System. Chronic obstructive pulmonary disease. Ann Arbor (MI): University of Michigan Health System; 2010 May. 17 p. [7 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the University of Michigan Health System (UMHS) Web site .

Availability of Companion Documents

The supplemental methodological appendix is available from the University of Michigan Health System (UMHS) Web site .

A self-study continuing medical education (CME) activity for this guideline is available from UMHS Web site .

Performance measures are provided in the original guideline document .

Patient Resources

Patient education materials are available on the University of Michigan Health System (UMHS) Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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