CLINICAL GUIDELINE:

POTENTIALLY AVOIDABLE CHRONIC CONDITIONS
Chronic Obstructive Pulmonary Disease

Physician Clinical Integration Network, LLC

Scope

According to the World Health Organization (WHO), 65 million people suffer from moderate to severe chronic obstructive pulmonary disease (COPD) [1]. The most common symptoms affecting the quality of life for most patients include shortness of breath, productive cough, fatigue, and limited exercise. Primary care providers are tasked with the challenges of correctly diagnosing COPD, improving patient adherence to treatment, and reducing the risk of acute exacerbations [2,9]. COPD is a major cause of chronic morbidity and mortality globally and is expected to increase, primarily due to continued exposure to COPD risk factors and an aging population [2].

This guideline provides recommendations, based on the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines for COPD, to reduce exacerbations and frequent hospitalizations. Certain co-morbidities may exist, and the implications of this coexistence must be considered when determining treatment.

Population Included

Adults ≥18 years of age

Exclusions

None

Guidance

The PCIN Quality Committee and its designees reviewed the available information in the medical literature and societal guidelines on the evaluation and management for COPD patients in the Primary Care setting, as well as information derived from their clinical practices to devise these guidelines.

The GOLD guidelines and updates by the American College of Physicians, American College of Chest Physicians, American Thoracic Society, and European Respiratory Society provide proven standards instrumental in the development of this guideline.

Recommendations

- ✓ Assessment and diagnosis should be based on a combination of:
  - Spirometry results
  - Physical examination findings
  - Medical history, including:
    - Onset and progression of symptoms
    - Social and occupational exposures
- ✓ Nonpharmacologic treatment should be based on the Refined ABCD Assessment Tool (Table 1) and the COPD severity level (Table 2), per Gold guidelines.
- ✓ The COPD Assessment Test (CAT) should be used and completed by patients to determine the level of impact the disease has on the patient (Table 3).
- ✓ Smoking Cessation
  - Assessment and education should be provided regarding smoking cessation at each visit.
- ✓ Influenza & pneumococcal vaccinations should be administered to reduce the risk of vaccine preventable diseases.
- ✓ Pulmonary rehabilitation should be provided for patients who had a recent exacerbation (i.e., <4 weeks).
- ✓ Education and care management should be provided focusing on:
  - A personalized action plan
  - Self-management skills to manage COPD
  - Medication adherence
  - Coping with COPD
  - Smoking cessation and environmental exposures
  - Importance of vaccinations
- ✓ Pharmacologic interventions based on GOLD guidelines (Tables 4, 5, 6 & 7)

Rationale

Assessment and Diagnosis

An accurate diagnosis of COPD is made using spirometry results combined with physical examination findings and a medical history review, providing information on the onset/progression of symptoms and any social/occupational risk factors (Figure 1) [9].

A chest X-ray will assist the clinician in excluding alternative diagnoses; however, it is not useful in establishing a diagnosis of COPD. While the CT scan is not routinely recommended, it may be beneficial in detecting bronchiectasis and cancer for those who meet specific risk criteria [2]. GOLD guidelines indicate spirometry can be used in stable patients, with a postbronchodilator Forced Expiratory Volume (FEV)/Forced Vital Capacity (FVC) ratio of less than 0.70 indicative of COPD (Table 2) [6].

GOLD guidelines developed a classification system of airflow limitations in COPD patients (Table 1) based on severity of the disease, assessed by the degree of airflow restriction, patient symptoms, and the number of exacerbations in one year. To improve the management of COPD, GOLD guidelines introduced the CAT test, a symptom questionnaire focusing on the level of impact the disease has on the patient (Table 3).

Nonpharmacologic Treatments

Based on the GOLD groups (A, B, C & D), the clinician can design a personalized approach to self-management of COPD [2]. Nonpharmacologic management and education should focus on the progression/stage of COPD:

Groups A, B, C & D: Focus on behavioral risk factors (smoking cessation, physical activity, ensuring adequate sleep, healthy diet)

Groups B & D: Assist the patient to self-manage breathlessness, energy conservation techniques, and stress management strategies

Groups C & D: Focus on avoidance of risk factors, monitoring and managing worsening symptoms, developing a written action plan and ongoing follow-up/communication with the medical provider

Group D: Focus on discussing palliative strategies and advance care directives

Smoking Cessation

Cigarette smoking is the leading environmental risk factor for COPD, with genetics playing a major role in the modification of this risk factor. While unclear if there is a genetic predisposition for the development of COPD, the effects of cigarette smoking on this population accentuates the risk [2]. Evidence supports that smoking cessation reduces COPD symptoms and functional decline [3].

The *International Journal of Chronic Obstructive Pulmonary Disease* reported the benefits of smoking cessation for COPD patients is noticeable within the first year of abstinence, particularly for female patients. Lung function may even mirror those who have never smoked. Knowing lung function diminishes with age, it's imperative smoking cessation be initiated at a young age for patients not yet diagnosed with COPD. For those who have already been diagnosed, smoking cessation is the only proven way of slowing down the progression of the disease [3].

Pneumococcal & Influenza Vaccinations

The U.S. Centers for Disease Control and Prevention recommends patients with COPD receive both the pneumonia and influenza vaccinations. Both pneumonia and influenza places substantial disease burden on COPD patients, increasing the mortality risk [4]. COPD patients are particularly susceptible to influenza, associated with exacerbations and pneumonia, resulting in increased risk for premature mortality [5].

Pulmonary Rehabilitation

Pulmonary rehabilitation is defined by The GOLD guidelines as "a comprehensive intervention based on thorough patient assessment followed by patient-tailored therapies that include, but are not limited to, exercise training, education, self-management intervention aiming at behavior change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviors" [2]. Pulmonary rehabilitation improves quality of life, exercise tolerance, and dyspnea, and it has been proven beneficial at reducing hospital readmissions for patients with an acute exacerbation $\leq$4 weeks post hospitalization [6].

These benefits are affected by the content, scope, frequency, and intensity of the rehab sessions. It is recommended the patient undergo a thorough assessment prior to rehab, taking into consideration patient goals, healthcare needs, smoking status, nutritional health, self-management capacity, health literacy, psychological health status and social circumstances, comorbid conditions and exercise capabilities/limitations [2].

Education & Case Management

According to the WHO, health education for COPD patients has a significant role in improving skills/health status and assists in their ability to cope with the disease [10].

While education is a key component in patient care, the GOLD guidelines state knowledge alone does not lead to a behavior change in COPD patients. Enhancing patient knowledge is an important step; however, successful change requires personalized education and training, considering specific patient needs that will enhance long-term behavior changes [2]. "A COPD self-management intervention is structured but personalized and often multi-component, with goals of motivating, engaging and supporting the

patients to positively adapt their health behavior(s) and develop skills to better manage their disease" [11]. Pilot studies on the effectiveness of a case management program for COPD patients offer striking results. A study by A.E. van Eeden et al, resulted in a 56% decrease in hospitalizations of patients with frequent readmissions. Patients experienced a more positive outlook on life, less anxiety, diagnosis acceptance, demonstration of when to contact their physicians, and medication adherence [8]. Research published in the *International Journal of Chronic Obstructive Pulmonary Disease* on the effects of a case management program identified positive results with a 13% decrease in admissions, increased median time between admissions, lower readmission rates, and significantly decreased length of stays [7].

COPD education should focus on supporting self-management by encouraging smoking cessation, promoting healthy lifestyle behaviors, providing routine monitoring (including spirometry for early identification of symptom changes), managing exacerbation risks and progression of ongoing treatment goals, and promoting medication adherence [9].

Pharmacologic Interventions

For a patient with stable COPD, medications can minimize symptoms, reduce risk and severity of exacerbations, and aid in improving health status and exercise tolerance. Most of these medications are inhaled; therefore, education on the proper inhalation technique is crucial to proper treatment [2]. Utilizing the ABCD classification system, GOLD guidelines has developed a model for the initiation (Table 5) and follow-up of pharmacological management of COPD [2].

All pharmacologic measures for this guideline are from the GOLD guidelines, determined to be best practice for the diagnosis and treatment of COPD (Tables 4, 5, 6 & 7) [2].

Follow-Up Treatment

In 2019, the GOLD guidelines updated to include a "Management Cycle" to ensure goals are attained and barriers are identified (Figure 2) [2].

Recommendations for the Treatment of Dyspnea:

- For patients already on a long-acting bronchodilator monotherapy, the use of two bronchodilators is recommended.
    - If adding the second long-acting bronchodilator does not improve the symptoms, consider stepping treatment down again to monotherapy or switching inhaler devices.
- For patients already on long-acting beta agonists/inhaled corticosteroids (LABA/ICS) treatment, long-acting muscarinic antagonists (LAMA) can be added.
    - If the original indication for the Inhaled Corticosteroids (ICS) was inappropriate or if there is a lack of response to ICS, consider switching from LABA/ICS to LABA/LAMA.
- Investigate for other causes of progressing dyspnea. [6]

References

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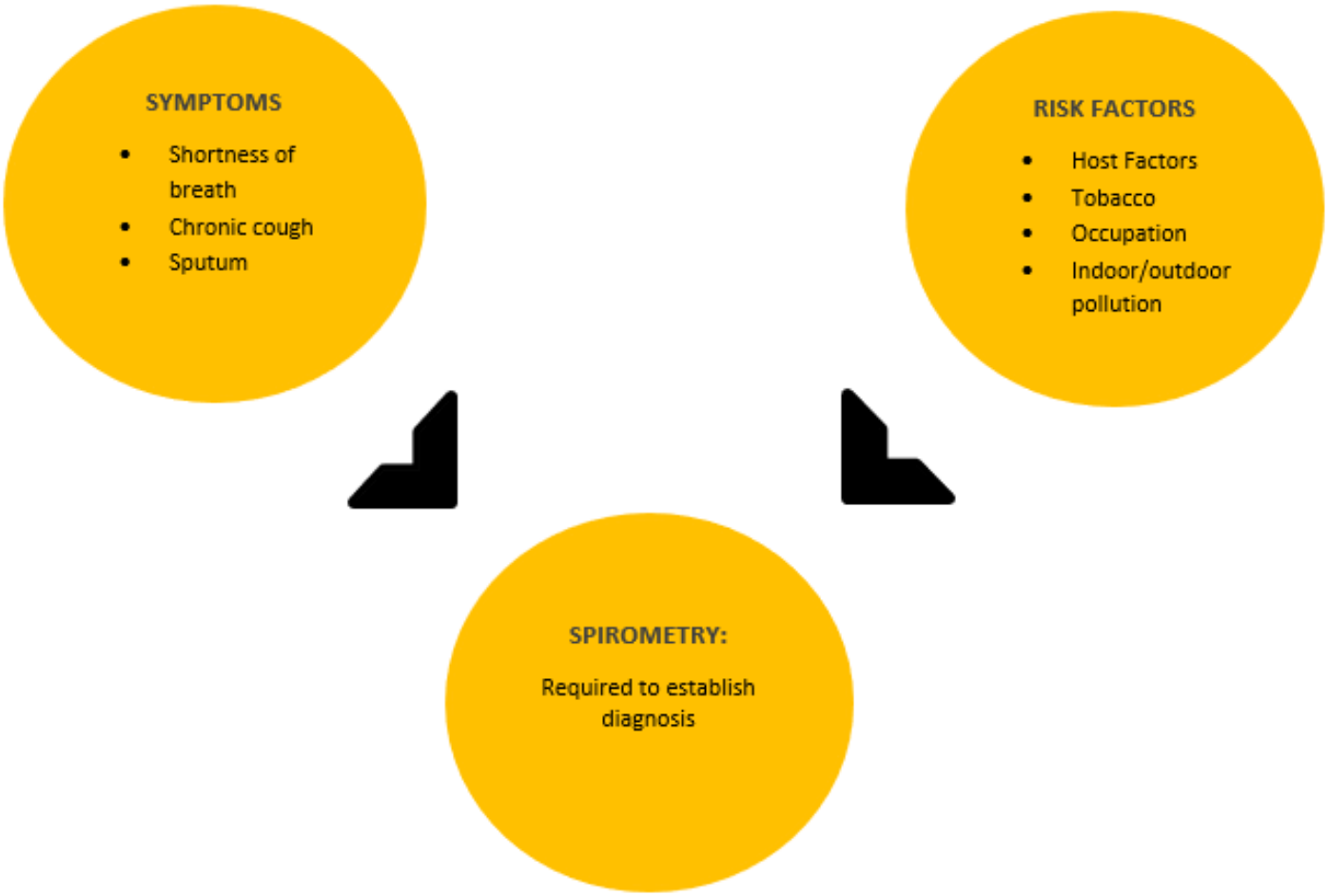
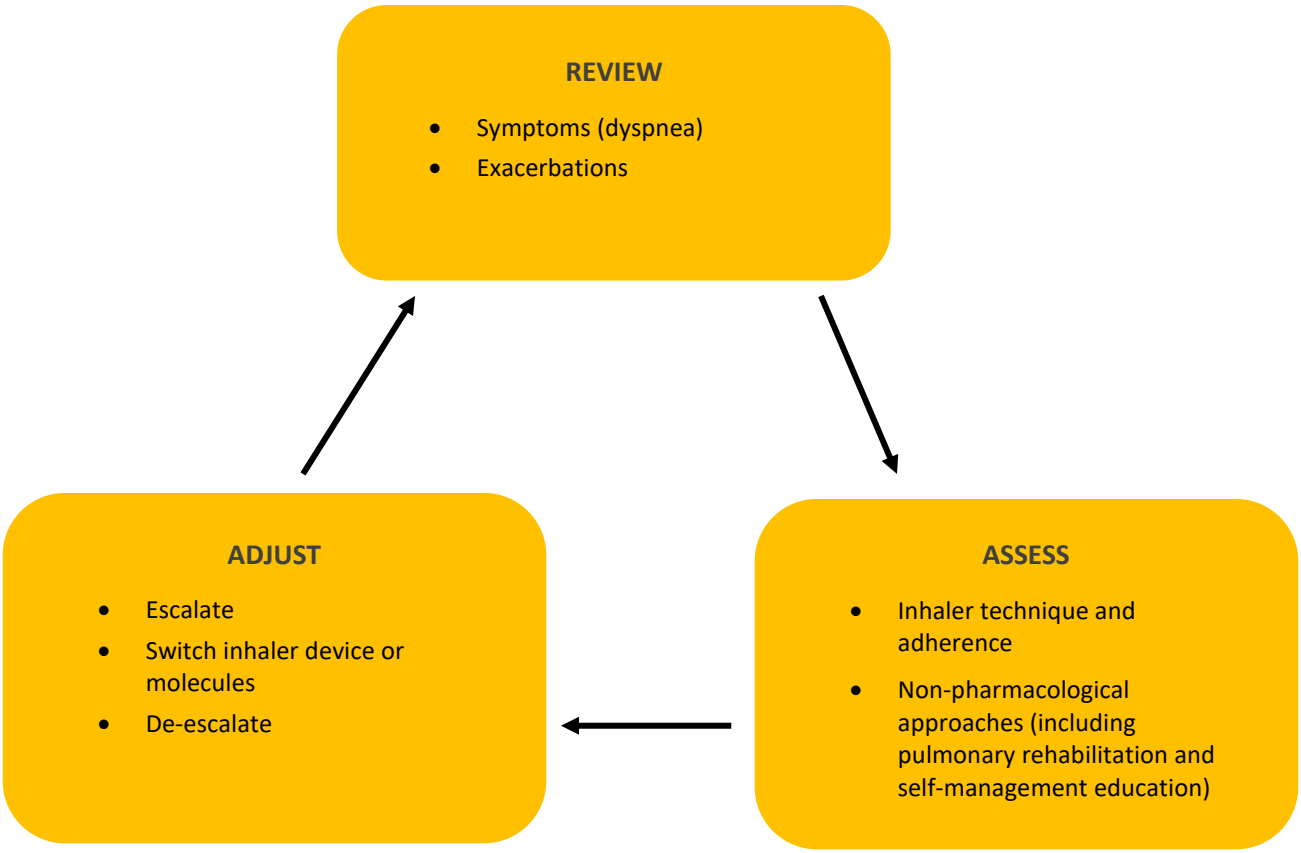
Appendix

Figure 1: Pathways to Diagnosis of COPD



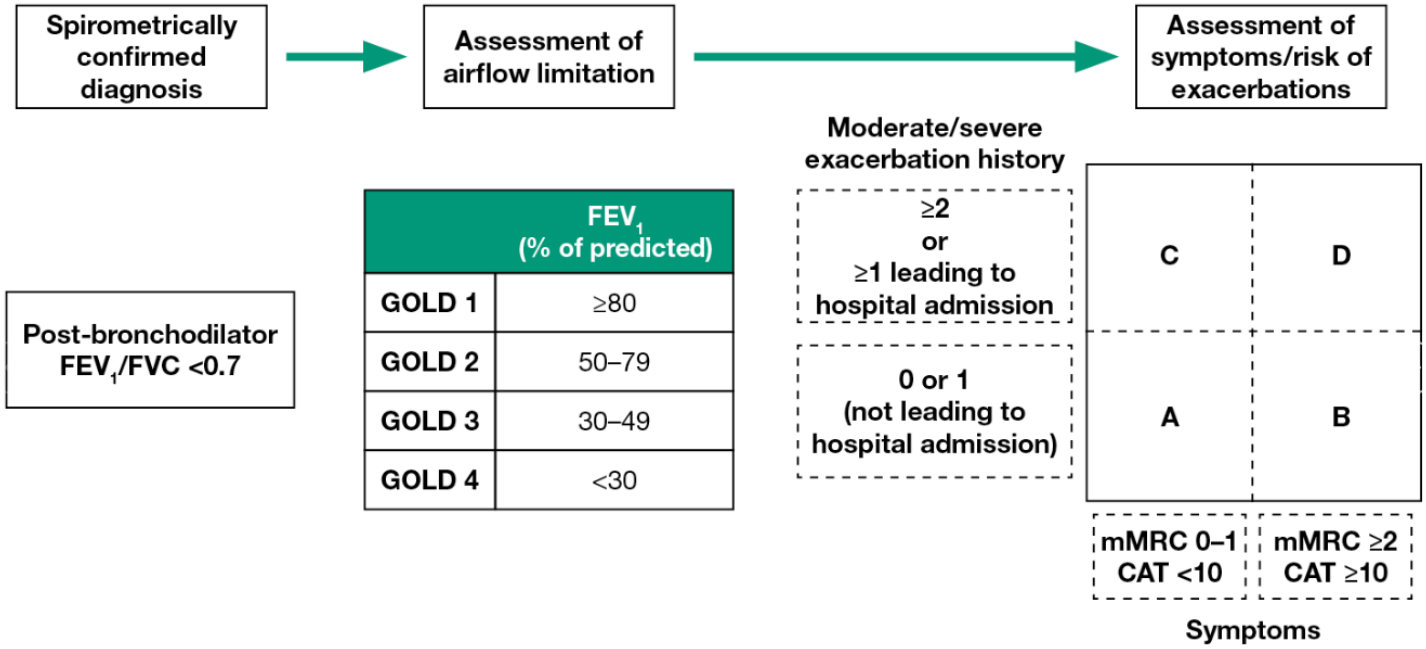
Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease. Updated 2019. Global Initiative for Chronic Obstructive Lung Disease website. https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-v1.7-FINAL-14Nov2018-WMS.pdf

Figure 2: Management Cycle



Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease. Updated 2019. Global Initiative for Chronic Obstructive Lung Disease website. https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-v1.7-FINAL-14Nov2018-WMS.pdf

Table 1: The Refined ABCD Assessment Tool (2019)



FEV_1=forced expiratory volume in the first second; FVC=forced vital capacity; mMRC=modified Medical Research Council; CAT=COPD assessment test.

Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease. Updated 2019. Global Initiative for Chronic Obstructive Lung Disease website. https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-v1.7-FINAL-14Nov2018-WMS.pdf

Table 2: Classification of Severity of Airflow Limitation in COPD

Classification of Severity of Airflow Limitation in Chronic Obstructive Pulmonary Disease**

In patients with FEV/FVC < 0.70:

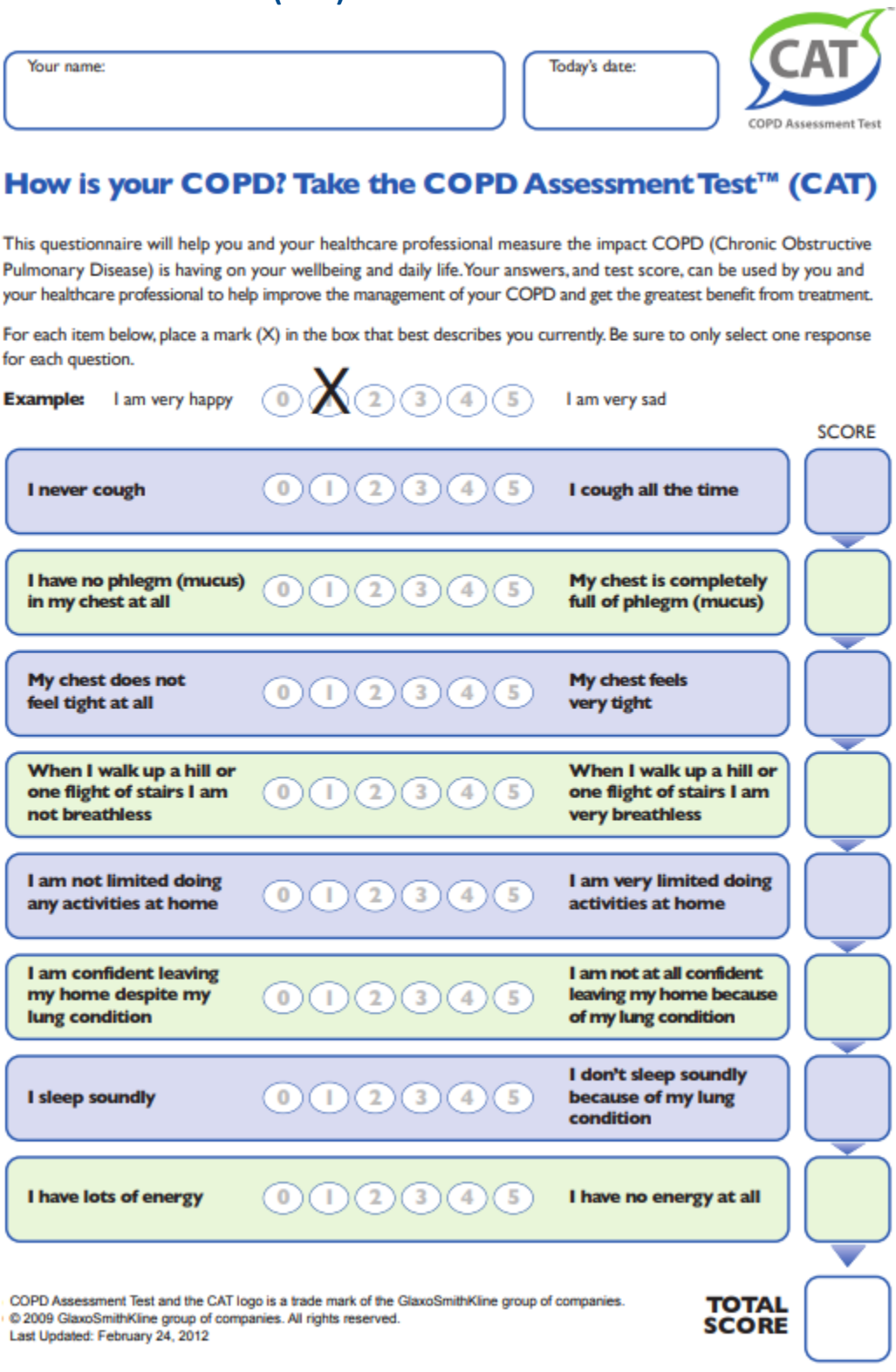
- GOLD 1 (mild): FEV ≥ 80% predicted
- GOLD 2 (moderate): 50% ≤ FEV, 80% predicted
- GOLD 3 (severe): 30% ≤ FEV, 50% predicted
- GOLD 4 (very severe): FEV < 30% predicted

FEV = forced expiratory volume in one second
FVC = forced vital capacity
GOLD = Global Initiative for Chronic Obstructive Lung Disease

** Based on postbronchodilator FEV

Lee H, Kim J, Tagmazyan K. (2013). Treatment of Stable Chronic Obstructive Pulmonary Disease: The GOLD Guidelines. American Family Physician.pdf. Retrieved from: https://www.aafp.org/afp/2013/1115/p655.html

Table 3: COPD Assessment Test (CAT)



Your name:

Today's date:

CAT
COPD Assessment Test

How is your COPD? Take the COPD Assessment Test™ (CAT)

This questionnaire will help you and your healthcare professional measure the impact COPD (Chronic Obstructive Pulmonary Disease) is having on your wellbeing and daily life. Your answers, and test score, can be used by you and your healthcare professional to help improve the management of your COPD and get the greatest benefit from treatment.

For each item below, place a mark (X) in the box that best describes you currently. Be sure to only select one response for each question.

Example: I am very happy 0 X 2 3 4 5 I am very sad

			SCORE
I never cough	0 1 2 3 4 5	I cough all the time	
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless	
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	
I have lots of energy	0 1 2 3 4 5	I have no energy at all	
		TOTAL SCORE	

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Last Updated: February 24, 2012

Lee H, Kim J, Tagmazyan K. (2013). Treatment of Stable Chronic Obstructive Pulmonary Disease: The GOLD Guidelines. American Family Physician.pdf. Retrieved from: https://www.aafp.org/afp/2013/1115/p655.html

Table 4: Initial Pharmacologic Management of Chronic Obstructive Pulmonary Disease

PATIENT GROUP	FIRST CHOICE	SECOND CHOICE	ALTERNATIVES
A	Short-acting anticholinergic as needed (e.g., ipratropium [Atrovent HFA]); or Short-acting beta2 agonist (e.g., Albuterol) as needed	Long-acting anticholinergic (e.g., Tiotropium [Spirva]); or Long-acting beta2 agonist (e.g., salmeterol [Serevent Diskus]); or Short-acting beta2 agonist and short-acting anticholinergic	Theophylline
B	Long-acting anticholinergic; or Long-acting beta2 agonist	Long-acting anticholinergic and long-acting beta2 agonist	Short-acting anticholinergic as needed and/or short-acting beta2 agonist as needed Theophylline
C	Inhaled corticosteroid (e.g., fluticasone [Flovent]) and long-acting beta2 agonist; or Long-acting anticholinergic	Long-acting anticholinergic and long-acting beta2 agonist	Phosphodiesterase-4 inhibitor (e.g., roflumilast [Dairesp]) Short-acting anticholinergic as needed and/or short-acting beta2 agonist as needed Theophylline
D	Inhaled corticosteroid and long-acting beta2 agonist; or Long-acting anticholinergic	Inhaled corticosteroid and long-acting anticholinergic; or Inhaled corticosteroid and long-acting beta2 agonist and long-acting anticholinergic; or Inhaled corticosteroid and long-acting beta2 agonist and phosphodiesterase-4 inhibitor; or Long-acting anticholinergic and long-acting beta2 agonist; or Long-acting anticholinergic and phosphodiesterase-4 inhibitor	Short-acting anticholinergic as needed and/or short-acting beta2 agonist as needed Theophylline

See Table 1 for the 2019 refined ABCD Assessment

Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease. Updated 2019. Global Initiative for Chronic Obstructive Lung Disease website. https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-v1.7-FINAL-14Nov2018-WMS.pdf

Table 5: Initial Pharmacological Treatment

≥2 moderate exacerbations or ≥1 leading to hospital admission	**Group C** LAMA	**Group D** LAMA or LAMA + LABA* or ICS + LABA** *Consider if highly symptomatic (e.g. CAT.20) **Consider if eos > 300
0 or 1 moderate exacerbations not leading to hospital admission	**Group A** A Bronchodilator	**Group B** A Long Acting Bronchodilator (LABA or LAMA)
	mMRC 0-1 CAT < 10	mMRC ≥ 2 CAT ≥ 10

Definition of abbreviations: eos: blood eosinophil count in cells per microliter; mMRC: modified Medical Research Council dyspnea questionnaire (Table 6); CAT: COPD Assessment Test (Table 3).

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Table 6: Modified Medical Research Council Dyspnea Questionnaire (mMRC)

Grade	Response
0	"I only get breathless with strenuous exercise."
1	"I get short of breath when hurrying on the level or walking up a slight hill"
2	"I walk slower than people of the same age on the level because of breathlessness or have to stop for breath when walking at my own pace on the level."
3	"I stop for breath after walking about 100 yards or after a few minutes on the level"
4	"I am too breathless to leave the house" or "I am breathless when dressing"

Anelise B Munari, Aline A Gulart, Karoliny dos Santos, Raysa S Venâncio, Manuela Karloh and Anamaria F Mayer. Respiratory Care September 2017, respcare.05636; DOI: https://doi.org/10.4187/respcare.05636

Table 7: Follow-Up Pharmacological Treatment – GOLD Standards (Page 93)

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