COPD Review

Webinar for
Michigan Center for Clinical Systems Improvement (Mi-CCSI)

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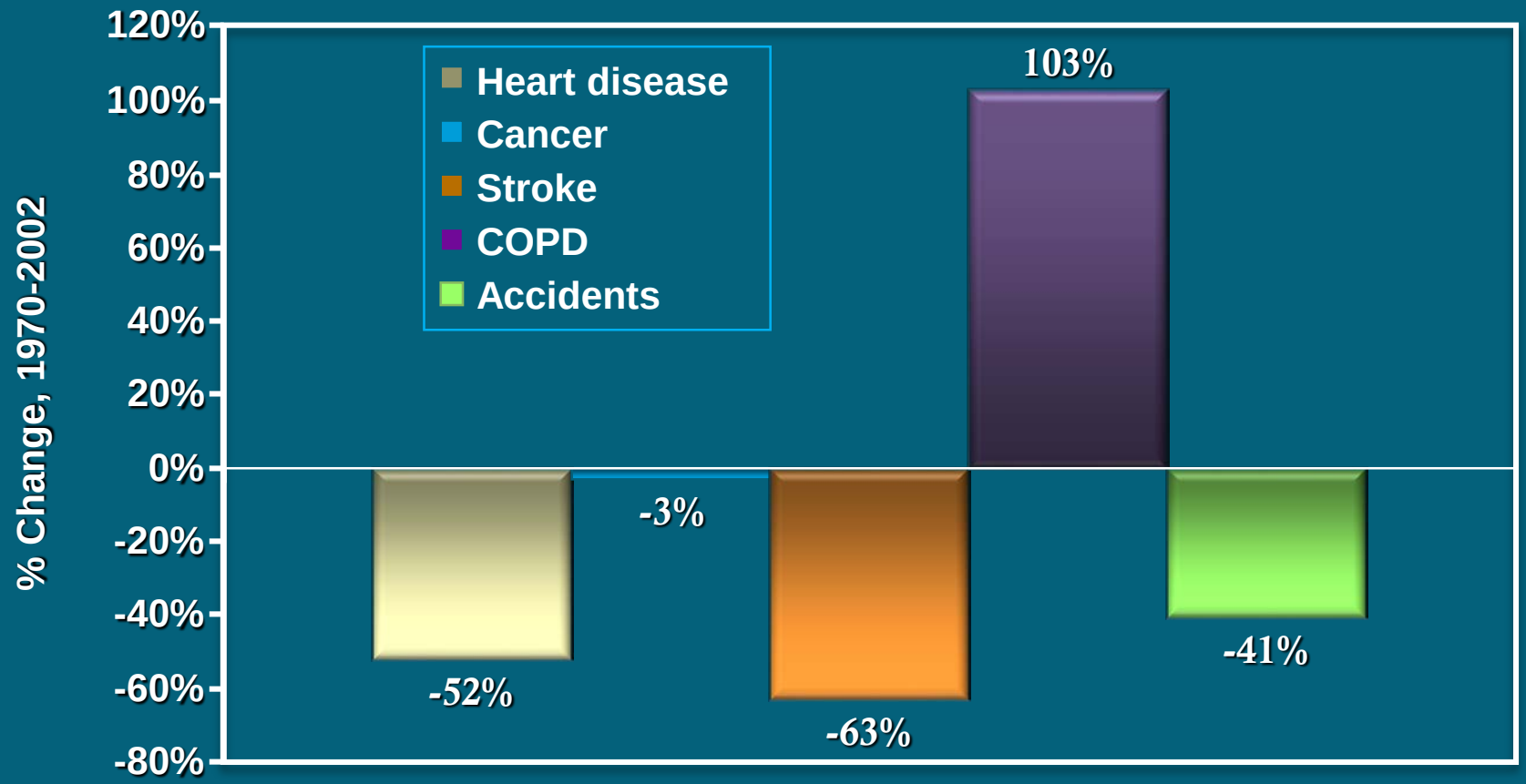
Priority Health

Top 5 Causes of Death

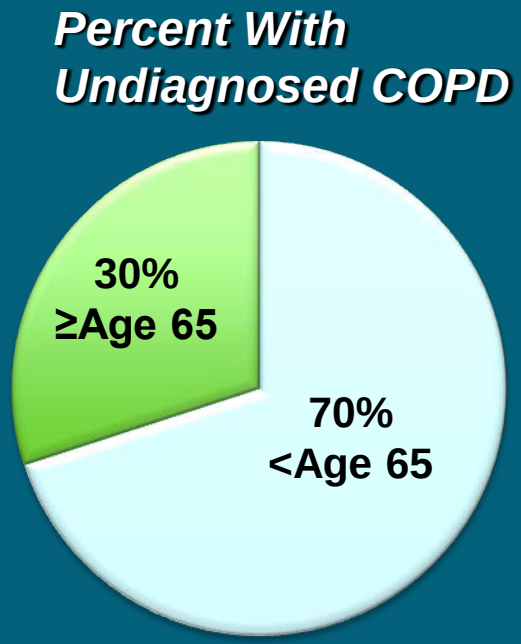
COPD 3rd Leading Cause of Death after Heart Disease and Cancer



Jemal A, et al. *JAMA.* 2005; 294:1255-1259.

Under-diagnosis of COPD in the United States

- Approximately 24 million adults have evidence of impaired lung function indicative of COPD
  - Over 12.7 million people have been diagnosed with COPD
  - Approximately half (50%) are undiagnosed
  - Most (70%) of patients with undiagnosed COPD are <65 years of age



Mannino DM, et al. *MMWR Surveill Summ*. 2002;51(1):1-13.
Mannino DM, et al. *Proc Am Thorac Soc.* 2007;4(7):502-306.
Pleis JR, et al. *Vital Health Stat*. 2006;132:1-153.

Significant Burden of COPD

- Why are approximately 50% of people with COPD undiagnosed?
  - Patients typically seek medical attention at the moderate stage of COPD
  - 81% of patients already had moderate to very severe COPD at initial spirometry-confirmed diagnosis
- Each year due to COPD, there are approximately
  - 16.3 million office visits
  - 672,000 hospitalizations
- More than 22% of Medicare patients hospitalized for COPD were readmitted within 30 days of discharge; 36% of these readmissions were due to COPD

Why is Early Diagnosis of COPD Important?

- Lung damage starts early and is progressive
- Breathlessness occurs early, increases with severity, and is underestimated by patients
- Inactivity is common but must be carefully assessed by the health care provider
- Even patients with mild disease can have exacerbations
- Earlier intervention (i.e., smoking cessation) leaves patients with more lung function

Definition of COPD

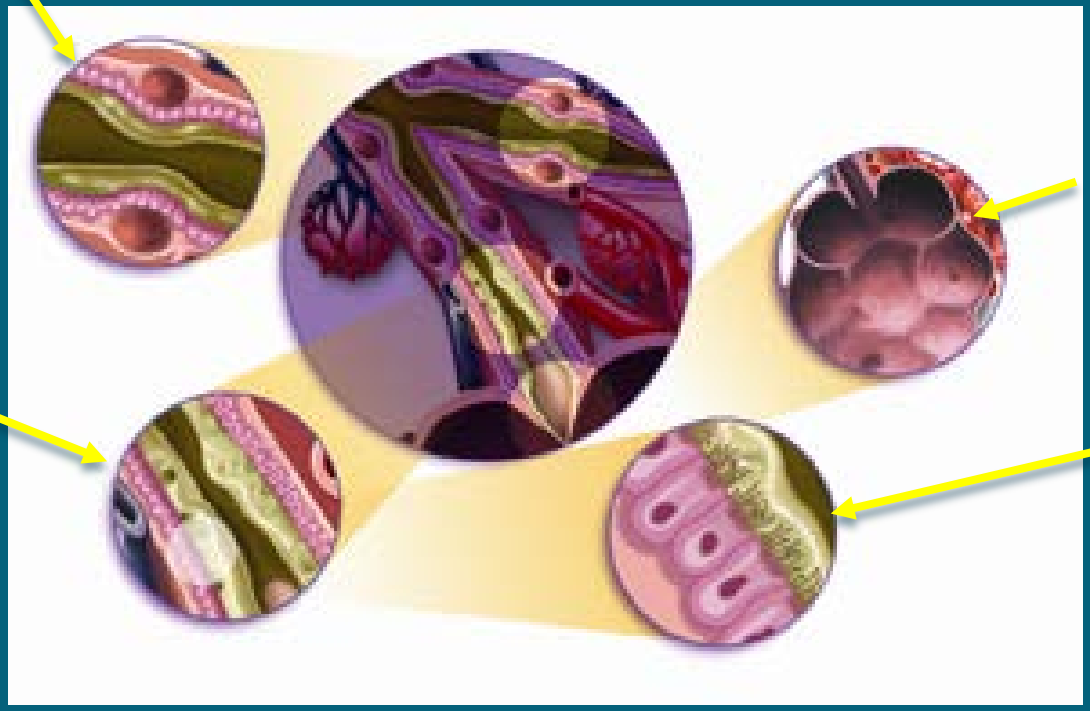
- According to the ATS/ERS COPD Guidelines, COPD is…"a **preventable** and **treatable** disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and is associated with an abnormal inflammatory response of the lungs to noxious particles or gases, primarily caused by cigarette smoking. Although COPD affects the lungs, it also produces significant systemic consequences."
- According to the GOLD guidelines, COPD is characterized by chronic inflammation throughout the airways

Definitions of Chronic Bronchitis and Emphysema

- Chronic bronchitis is clinically defined as chronic productive cough for 3 months in each of 2 successive years in a patient in whom other causes of productive chronic cough have been excluded
- Emphysema is defined as abnormal, permanent enlargement of the airspaces distal to the terminal bronchioles, accompanied by destruction of their walls, yet without obvious fibrosis

COPD Is a Multicomponent Disease[1-3]

BRONCHOCONSTRICTION
- Tightness in the smooth muscle surrounding the airways in the lungs



STRUCTURAL CHANGES
- Permanent damage to airways and alveoli

INFLAMMATION
- Structural changes
- Narrowing of small airways
- Increase in inflammatory cells

MUCOCILIARY DYSFUNCTION
- Excessive mucus production and decreased clearance

1. Global Initiative for Chronic Obstructive Lung Disease. *Global Strategy for the Diagnosis, Management and Prevention of COPD*, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2010. http://www.goldcopd.org. Accessed April 13, 2011.
2. Agusti AG. *Respir Med*. 2005;99:670-682.
3. Rodriguez-Roisin R. *COPD*. 2005;2:253-262.

Some Diagnostic Indicators for COPD

- Dyspnea
  - Initially during exercise
  - Progresses to occur with minimal exercise or at rest
- Chronic cough
  - Intermittent early in disease process
  - Occurring primarily in morning
  - Persists throughout day with disease progression
- Sputum production
  - Any pattern of chronic sputum production may indicate COPD
- History of exposure to risk factors
  - Tobacco smoke
  - Occupational dusts and chemicals
  - Smoke from wood-burning stoves and heating fuels

Who Is the COPD Patient?

Perception[3-5]

Myth: COPD is a disease of the elderly[1]

Myth: COPD is a disease of men[2]

1. Tinkelman, et al. *Am J Manag Care*. 2003;9:767-771. 2. Chapman KR. *Clin Chest Med.* 2004; 25:331-334. 3. Rennard SI. *New Engl J Med*. 2004; 350:965-966. 4. Kleinschmidt P. COPD and emphysema. Available at http://emedicine.medscape.com/article/807143-overview. 5. Rennard SI. *N Engl J Med*. 2004;305:965-966.

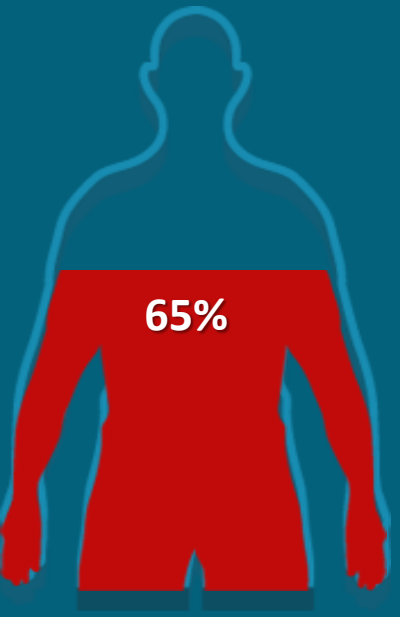
COPD in Younger Patients and Women Is on the Rise

Reality

- Reality: COPD afflicts the working-age population.
- Reality: COPD is also a disease of women.

Mannino, et al. *MMWR.* 2002;51(1)(6 suppl):1-13.

COPD Is Not a Man's Disease

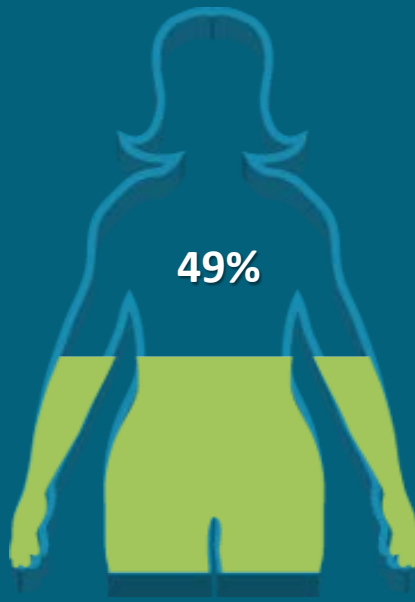


Hypothetical Male Patient With COPD Symptoms

Diagnosed as COPD by 65% of physicians

Hypothetical Female Patient With COPD Symptoms

Diagnosed as COPD by 49% of physicians



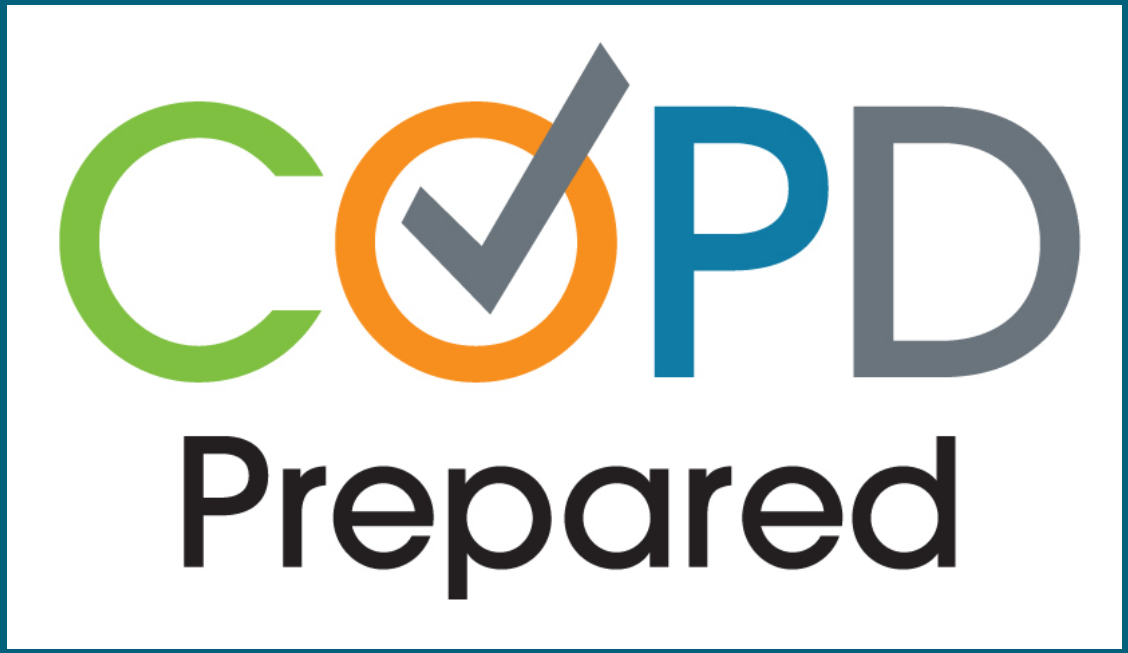
COPD symptoms in women were most commonly misdiagnosed as asthma.

Chapman KR, et al. *Chest.* 2001;119(6):1691-1695.

Patient Education

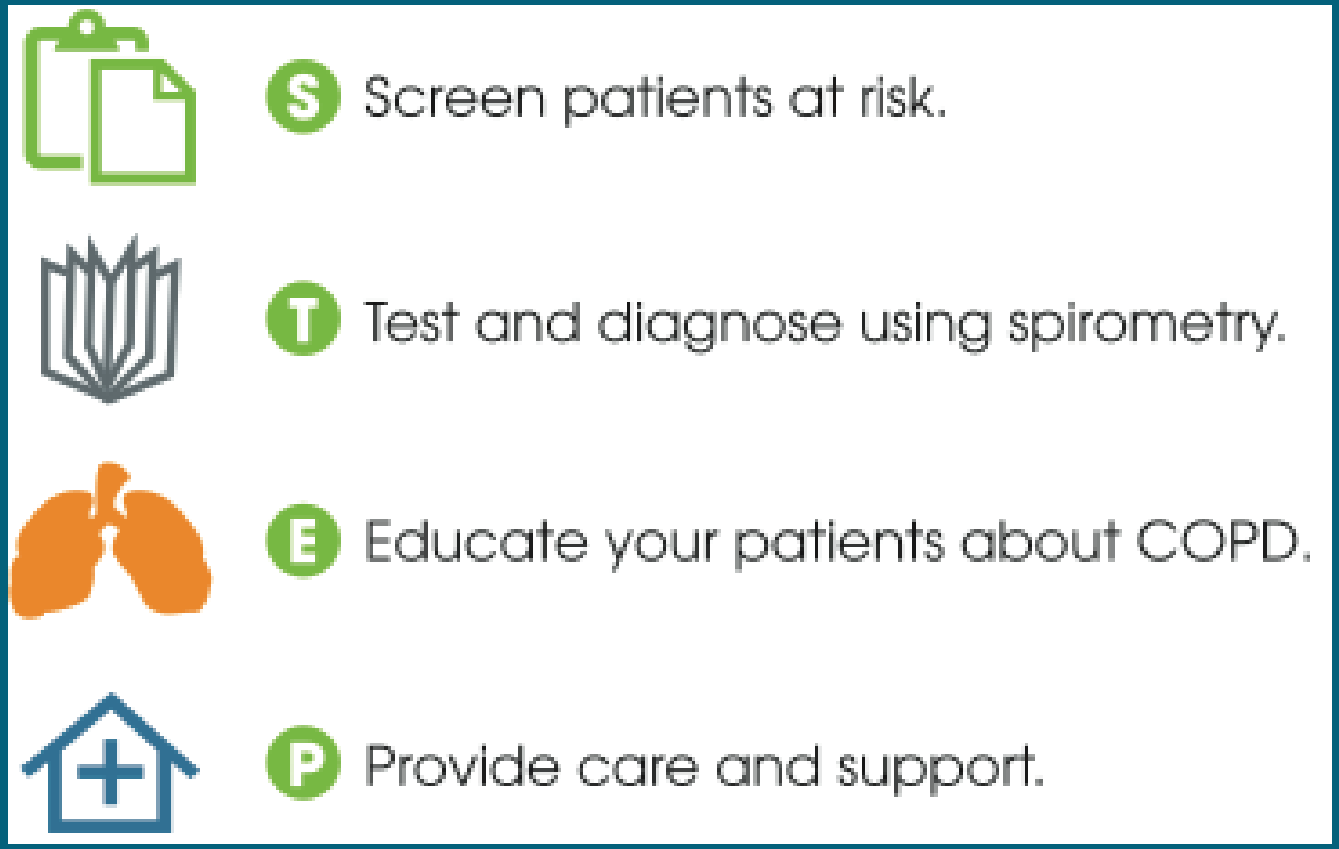
The goal of all patient education is to help patients take the actions needed to control their asthma or COPD.

Becoming COPD Prepared: A 4-STEP Approach



www.copd.org

STEP: A Framework for COPD Care



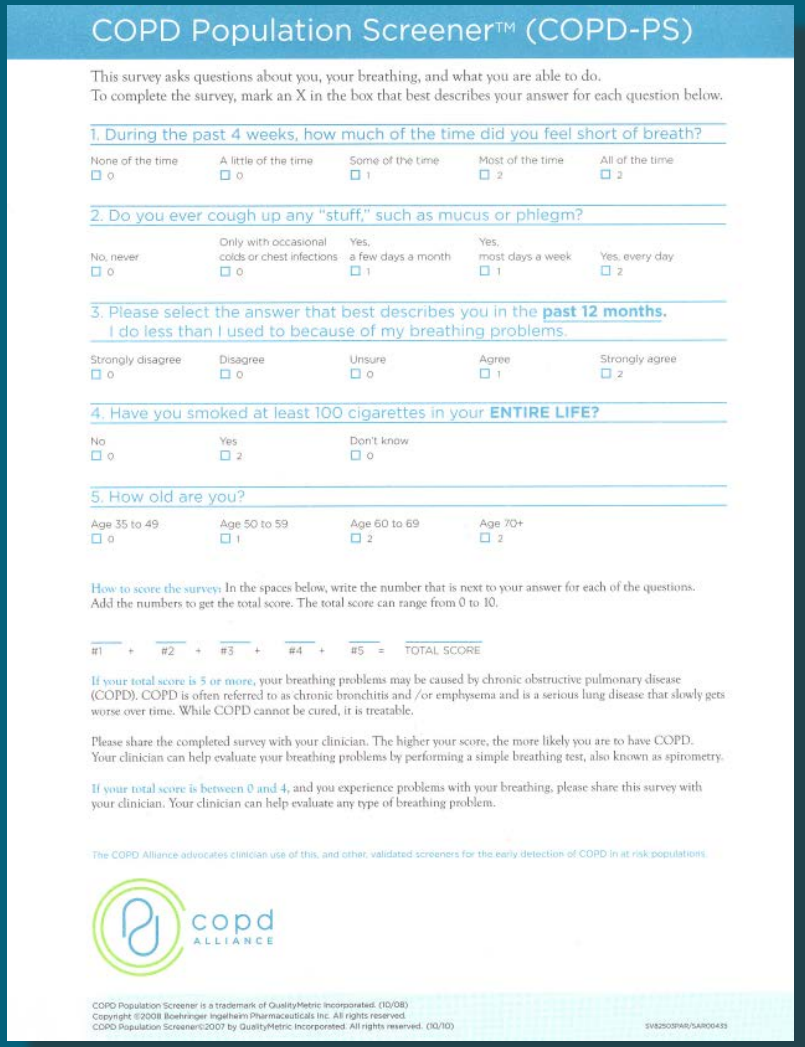
Screening for COPD using a validated screening tool is an important step in identifying patients who may be at risk for COPD.

STEP Tools on COPD.org

- **COPD Screener**
  - This validated COPD screening tool uses five questions to determine a patient's risk for COPD and the potential need for spirometry testing.
  - The screener is available in English and Spanish
  - Treatment room poster

Screening patients for COPD

- The COPD Alliance[1] recommends the utilization of a simple validated[2] questionnaire
- **COPD Population Screener™** - download at www.COPD.org
- Persons at risk should be asked to complete the screener.



COPD Population Screener™ (COPD-PS)

This survey asks questions about you, your breathing, and what you are able to do.
To complete the survey, mark an X in the box that best describes your answer for each question below.

1. During the past 4 weeks, how much of the time did you feel short of breath?

None of the time	A little of the time	Some of the time	Most of the time	All of the time
☐ 0	☐ 0	☐ 1	☐ 2	☐ 2

2. Do you ever cough up any "stuff," such as mucus or phlegm?

No, never	Only with occasional colds or chest infections	Yes, a few days a month	Yes, most days a week	Yes, every day
☐ 0	☐ 0	☐ 1	☐ 1	☐ 2

3. Please select the answer that best describes you in the **past 12 months.**
I do less than I used to because of my breathing problems.

Strongly disagree	Disagree	Unsure	Agree	Strongly agree
☐ 0	☐ 0	☐ 0	☐ 1	☐ 2

4. Have you smoked at least 100 cigarettes in your **ENTIRE LIFE?**

No	Yes	Don't know
☐ 0	☐ 2	☐ 0

5. How old are you?

Age 35 to 49	Age 50 to 59	Age 60 to 69	Age 70+
☐ 0	☐ 1	☐ 2	☐ 2

How to score the survey: In the spaces below, write the number that is next to your answer for each of the questions. Add the numbers to get the total score. The total score can range from 0 to 10.

___ #1 + ___ #2 + ___ #3 + ___ #4 + ___ #5 = ___ TOTAL SCORE

If your total score is 5 or more, your breathing problems may be caused by chronic obstructive pulmonary disease (COPD). COPD is often referred to as chronic bronchitis and /or emphysema and is a serious lung disease that slowly gets worse over time. While COPD cannot be cured, it is treatable.

Please share the completed survey with your clinician. The higher your score, the more likely you are to have COPD. Your clinician can help evaluate your breathing problems by performing a simple breathing test, also known as spirometry.

If your total score is between 0 and 4, and you experience problems with your breathing, please share this survey with your clinician. Your clinician can help evaluate any type of breathing problem.

The COPD Alliance advocates clinician use of this, and other, validated screeners for the early detection of COPD in at risk populations.

copd ALLIANCE

[1]The COPD Alliance is composed of multidisciplinary societies, i.e., AANP, AAPA, ACCP, ACOFP, ACOI

[2] Martinez FJ et al. COPD.2008;5(2):85-95

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No, never	Only with occasional colds or chest infections	Yes, a few days a month	Yes, most days a week	Yes, every day
☐ 0	☐ 0	☐ 1	☐ 1	☐ 2

3. Please select the answer that best describes you in the **past 12 months.** I do less than I used to because of my breathing problems.

Strongly disagree	Disagree	Unsure	Agree	Strongly agree
☐ 0	☐ 0	☐ 0	☐ 1	☐ 2

4. Have you smoked at least 100 cigarettes in your **ENTIRE LIFE?**

No	Yes	Don't know
☐ 0	☐ 2	☐ 0

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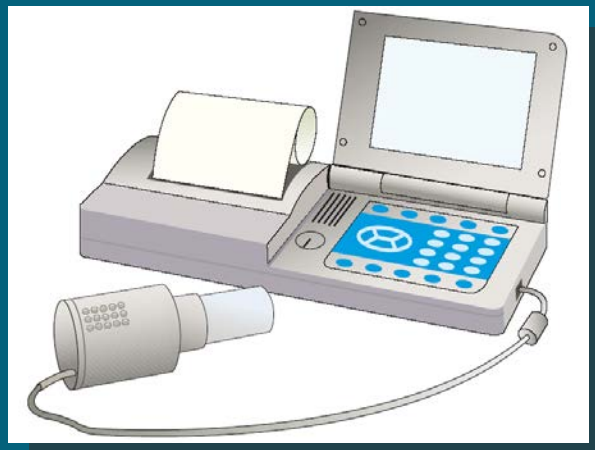
www.copd.org

SVIE2503PAR/SAR004355

Spirometry is a test that measures the amount of air a patient can breathe out and the amount of time it takes to do so. Spirometry can be administered by trained office staff in a primary care setting.

Diagnosis of COPD

- Diagnosis often does not occur until the disease has progressed significantly
  - Lack of serious symptoms and poor recognition of clinical symptoms in early phase
- COPD is confirmed by performing a lung function test: post-bronchodilator spirometry.



Global Initiative for Chronic Obstructive Disease. Global strategy for the diagnosis, management, and prevention of COPD. Updated 2011. http://www.goldcopd.org

Recommendations From the National Lung Health Education Program

- Primary care clinicians should perform an office spirometry test for the following patients:
  - Patients ≥45 years old who report smoking (current smokers and those who recently quit) in order to detect COPD
  - Patients with respiratory symptoms, such as chronic cough, sputum production, wheezing, or dyspnea on exertion

Ferguson GT, et al. *Chest.* 2000;117(4):1146-1161.

Spirometry Is Essential for Diagnosing COPD

If . . . Chronic symptoms = cough, sputum, and/or shortness of breath

And . . . Exposure to risk factors = tobacco, occupational irritants, and/or indoor/outdoor pollution

Then . . . Spirometry* to confirm COPD diagnosis
- FEV1/FVC <0.70
- FEV1 determines staging

***Additional testing: chest radiograph, echocardiogram, arterial blood gas, sputum analysis, CT scan.**

Global Initiative for Chronic Obstructive Disease. Global strategy for the diagnosis, management, and prevention of COPD. Updated 2011. www.goldcopd.org

Barriers to Spirometry Use

- Overcoming barriers to spirometry use may lead to increased COPD diagnosis.
  - Uncertainty about the impact of the test on outcome[1]
  - Lack of training on spirometry use[1,2]
  - Poor education on interpreting results[1,2]
  - Time and logistical constraints[3]
  - Reimbursement concerns[1]

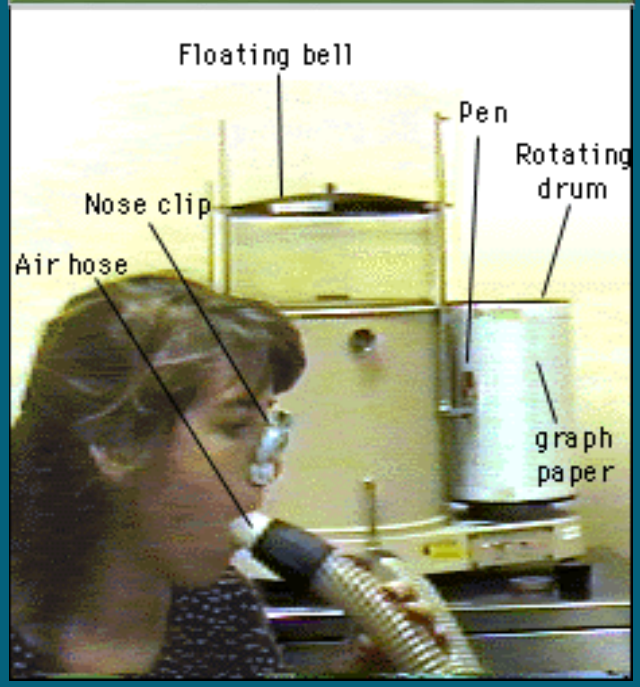
1. Kaminsky DA, et al. *Respir Care.* 2005;50(12):1639-1648. 2. Díaz-Lobato, et al. *Chest.* 2004;126(5):1712-1713. 3. Caramori, et al. *Monaldi Arch Chest Dis.* 2005;62:6-12.

Spirometry in Primary Care

- Clinical Value
  - Confirms diagnosis and assesses severity of COPD
  - Helps to differentiate asthma from COPD
  - Helps to assess response to bronchodilator therapy
- The instrument is inexpensive, easy to maintain, and well reimbursed.
- Primary care clinicians can be trained to perform accurate interpretations.

Yawn BP, et al. *Chest*. 2007;132(4):1162-1168.

Old Spirometer



NEW Portable Office Spirometers

Predicted Normal Values

Affected by:

- Age
- Height
- Sex
- Ethnic Origin

Spirometric Diagnosis of COPD

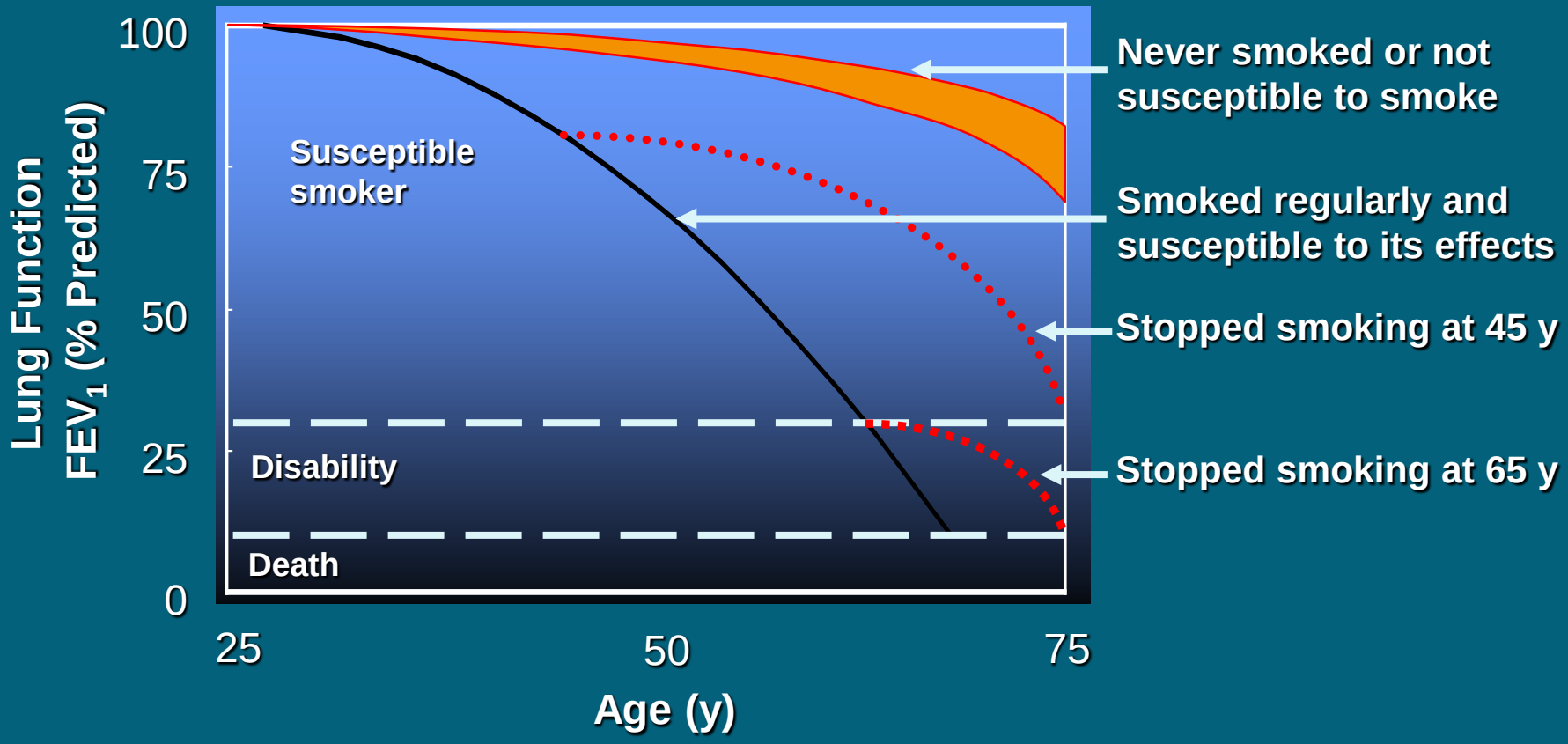
- COPD is confirmed by post-bronchodilator $FEV_1/FVC < 0.70$
- Post-bronchodilator FEV_1 measured 10-15 minutes after 2 to 4 puffs of a short-acting bronchodilator

Pharmacologic Therapy for Stable COPD

- All patients who are symptomatic merit a trial of drug treatment.
- Current long-acting medications can
  - Reduce symptoms
  - Increase exercise capacity
  - Reduce number and severity of exacerbations
  - Improve health status

Celli et al. *Eur Respir J.* 2004;23(6):932-946.

Smoking Abstinence: Slows Progression of COPD



Fletcher C, et al. *Br Med J.* 1977;1(6077):1645–1648.

It is essential that you take the time to educate your patients about COPD, including symptoms, diagnosis, triggers of an exacerbation, and how to live better with the disease.

STEP Tools on COPD.org

- ✓Flip Chart – Developed by the AANP “A Breath of Fresh Air” enables clinicians to have a thorough dialogue with their patients about everything from adherence to nutrition.
- ✓Video to show patients the proper use of all available inhalers.

Providing care and support to COPD patients is what clinicians strive to do at the highest levels and it is also the fourth STEP in becoming COPD Prepared.

Role of Care Managers in Managing Patients with COPD

- Care Managers can assist in identifying patients complaining of cough or shortness of breath who may be at risk for respiratory disorders
- Ask patients over 40 years of age who are current or ex-smokers the following questions:
  - Do you cough regularly?
  - Do you cough up phlegm regularly?
  - Do simple chores make you short of breath?
  - Do you wheeze when you exert yourself, or at night?
  - Do you get frequent colds that persist longer than those of other people you know?
- If patients answer yes to any of these questions, consider spirometric testing

Role of Care Managers in Managing Patients with COPD

- Promote education on COPD and self-management techniques
- Counsel patients on the correct use of inhalers
- Care Managers should demonstrate or review the use of all newly prescribed devices and observe the patient's use of each device
- Question patients about their medication adherence in a nonjudgmental manner and take steps to resolve any reported problems

Role of Care Managers in Managing Patients with COPD

- Care Managers can assist patients in the prevention and management of COPD and COPD exacerbations by:
  - Identifying and referring patients who may have COPD
  - Educating patients on COPD and self-management techniques
  - Counseling patients on smoking cessation
  - Recommending vaccinations
  - Educating patients on signs/symptoms of COPD exacerbation
- Care Managers are well positioned to play a key role in many aspects of COPD management

Prevent COPD Exacerbations

- Defined as an acute change in a patient's baseline dyspnea, cough, and/or sputum beyond day-to-day variability, and sufficient to warrant a change in therapy
- The prevention of exacerbations is recognized as a goal in COPD disease-state management
- Frequency of exacerbations contributes to a decline in lung function and significant worsening in quality of life

Prevent COPD Exacerbations

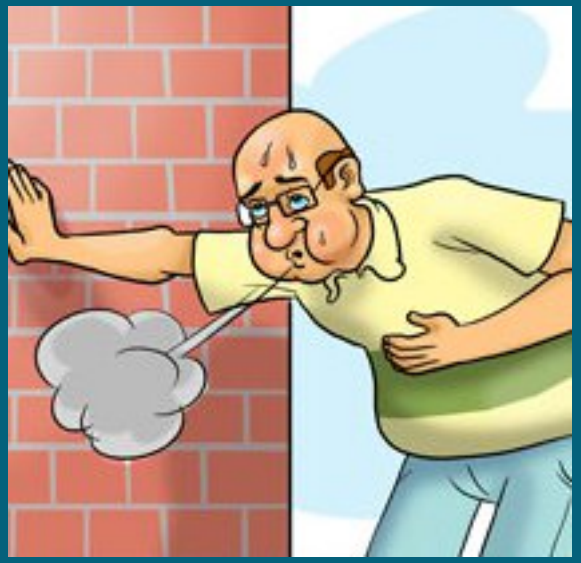
- Changes in the following that are beyond normal day-to-day variations, are acute in onset, and may warrant a change in regular medication:
  - Baseline dyspnea (or breathlessness)
  - Cough
  - Sputum
- Increased breathlessness that may be accompanied by the following:
  - Wheezing and chest tightness
  - Increased cough and sputum
  - Change of the color and/or tenacity of sputum
  - Fever
- Tachycardia and tachypnea, malaise, insomnia, sleepiness, fatigue, depression, and confusion may accompany COPD exacerbations
- Decrease in exercise tolerance, fever, and/or new radiologic anomalies suggestive of pulmonary disease may be additional signs of COPD exacerbation

Prevent COPD Exacerbations

- Defined as an acute change in a patient's baseline dyspnea, cough, and/or sputum beyond day-to-day variability, and sufficient to warrant a change in therapy
- Evidence supports that exacerbations are acute inflammatory events superimposed on the chronic inflammation characteristic of COPD
- In a 12-month study, 77% of patients had at least 1 exacerbation
- Frequency of exacerbations contributes to a decline in lung function and significant worsening in quality of life
- The prevention of exacerbations is recognized as a goal in COPD disease-state management

Help Patients Recognize and Treat Exacerbations

- Changes in signs and symptoms from baseline:
  - Shortness of breath, even at rest
  - More wheezing, coughing, mucus
  - Mucus looks different
  - Chest tightness
  - Irritable, fatigued, no energy
  - Fever
  - Color changes
  - Rapid breathing, heart rate



Tips for Reducing Exacerbations

- Wash hands often
- Avoid close contact with people who are ill
- Get a flu shot yearly and make sure pneumonia immunization is up to date
- Use your long-term control medications daily
- Use antibiotics quickly for infections or sinus problems
- Follow the COPD Action Plan

MY COPD ACTION PLAN

It is recommended that patients and physicians /healthcare providers complete this action plan together. This plan should be discussed at each physician visit and updated as needed.

AMERICAN LUNG ASSOCIATION.
Fighting for Air

The green, yellow and red zones show groups of symptoms of COPD. The list of symptoms is not comprehensive, and you may experience other symptoms. In the "Actions" column, your healthcare provider will recommend actions for you to take based on your symptoms by checking the appropriate boxes. Your healthcare provider may write down other actions in addition to those listed here.

Green Zone: I am doing well today	Actions
• Usual activity and exercise level • Usual amounts of cough and phlegm/mucus • Sleep well at night • Appetite is good	☐ Take daily medicines ☐ Use oxygen as prescribed ☐ Continue regular exercise/diet plan ☐ At all times avoid cigarette smoke, inhaled irritants* ☐ _____ ☐ _____

Yellow Zone: I am having a bad day or a COPD flare	Actions
• More breathless than usual • I have less energy for my daily activities • Increased or thicker phlegm/mucus • Using quick relief inhaler/nebulizer more often • Swelling of ankles more than usual • More coughing than usual • I feel like I have a "chest cold" • Poor sleep and my symptoms woke me up • My appetite is not good • My medicine is not helping	☐ Continue daily medicati ☐ Use quick relief inhaler every _____ hours ☐ Start an oral corticosteroid (specify name, dose and duration) ☐ _____ ☐ Start an antibiotic (specify name, dose and duration) ☐ _____ ☐ Use oxygen as prescribed ☐ Get plenty of rest ☐ Use pursed lip breathing ☐ At all times avoid cigarette smoke, inhaled irritants* ☐ Call provider immediately if symptoms don't improve*

Red Zone: I need urgent medical care	Actions
• Severe shortness of breath even at rest • Not able to do any activity because of breathing • Not able to sleep because of breathing • Fever or shaking chills • Feeling confused or very drowsy • Chest pains • Coughing up blood	☐ Call 911 or seek medical care immediately ☐ While getting help, immediately do the following: ☐ _____ ☐ _____

*The American Lung Association recommends that the providers select this action for all patients.

For more information, visit www.Lung.org or call 1-800-LUNG-USA (1-800-586-4872)

October 2012

Know When to Call the Provider

- Shortness of breath or wheezing that does not resolve after using inhaler
- Change in color, smell, amount or thickness of mucus coughed up
- New or increased ankle swelling
- Awaken with shortness of breath > once/night
- Very tired and this lasts > than one/day
- Have a fever that lasts

Know When to go to the Hospital

- Confusion, slurring of speech or sleepiness during a serious lung infection
- Loss of alertness or two or more of:
  - Increase in seriousness of symptoms, such as trouble breathing at rest
  - Struggling to use your upper chest or neck muscles to try to breathe
  - A large increase in how fast your heart is beating
  - A large increase in how fast you are breathing
- Any severe shortness of breath or chest pain or any other severe symptom

Your name:

Today's date:

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	

Last Updated: February 24, 2012

eFigure A. COPD Assessment Test.

Reprinted with permission from GlaxoSmithKline. COPD assessment test. http://catestonline.org/english/indexEN.htm. Accessed August 20, 2013. Copyright © GlaxoSmithKline group of companies. All rights reserved.

COPD Assessment Test (CAT)

- I never cough…I cough all the time
- I have no phlegm (mucus) in my chest at all…My chest is completely full of phlegm (mucus)
- My chest does not feel tight at all…My chest feels very tight
- When I walk up a hill or one flight of stairs I am not breathless…I am very breathless…
- I am confident leaving my home despite my lung condition…I am not confident…
- I sleep soundly…I don't sleep soundly because of my lung condition
- I have lots of energy…I have no energy at all

* Range of CAT scores from 0–40. Higher scores denote a more severe impact of COPD on a patient's life. The difference between stable and exacerbation patients was five units. No target score represents the best achievable outcome.

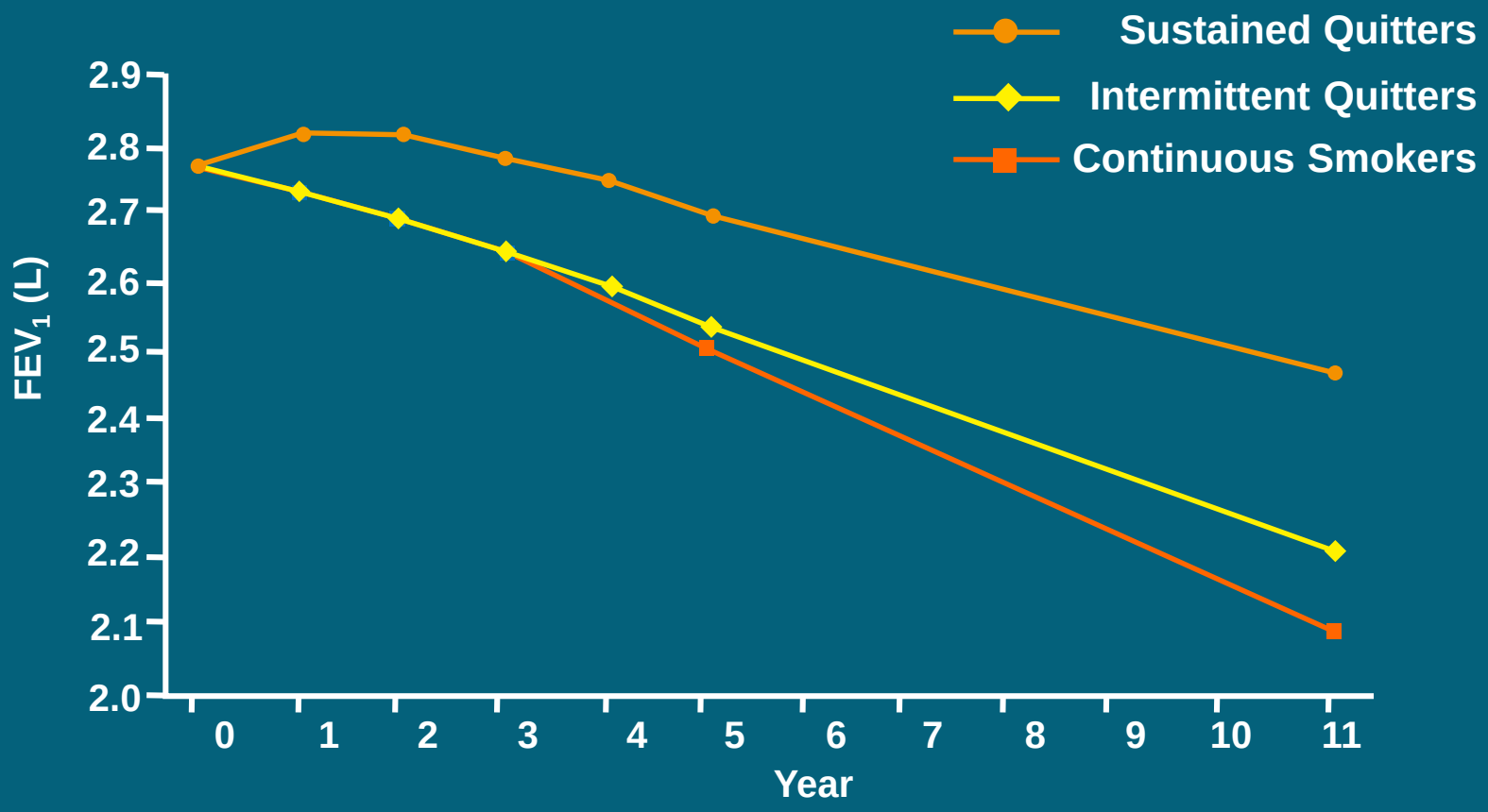
Role of the Care Manager in Managing Patients with COPD

Smoking cessation is the single most effective and cost-effective intervention to reduce the risk of developing COPD and slow its progression

- Smoking cessation has the greatest capacity to influence the natural history of COPD. Health care providers should encourage all patients who smoke to quit.

- Additional benefits of smoking cessation:
  - Lung function begins to improve in 2 weeks to 3 months after quitting
  - Coughing and shortness of breath decreases in 1-9 months after quitting

Smoking Cessation: It's never too late to benefit lung function



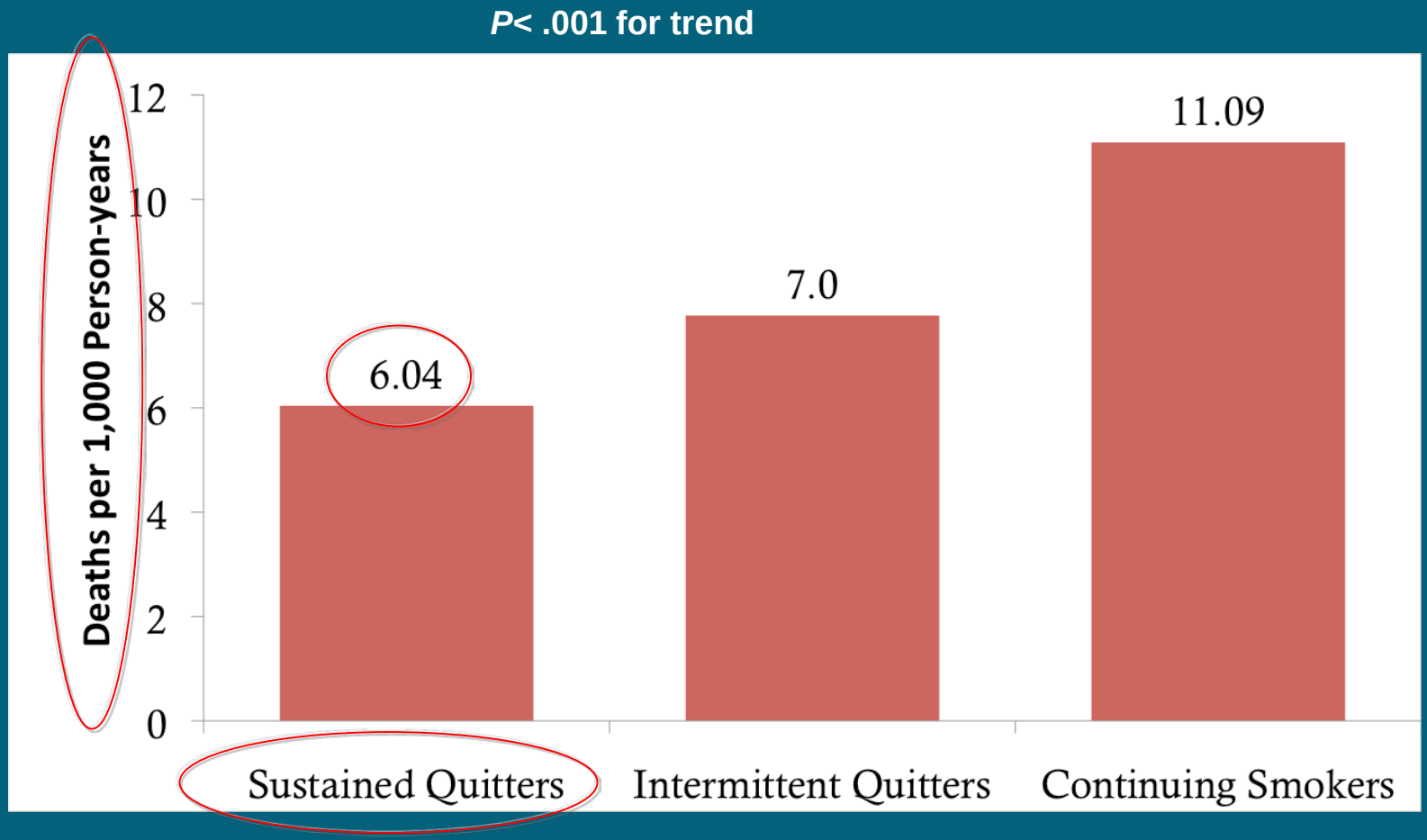
Loss of lung function over 11 years in the Lung Health Study.

Anthonisen NR, Connett JE, Murray RP for the Lung Health Study Research Group. Smoking and Lung Function of Lung Health Study Participants after 11 Years. *Am J Respir Crit Care Med.* 2002;166:675-679.

Brief Strategies to Help the Patient Willing to Quit Smoking

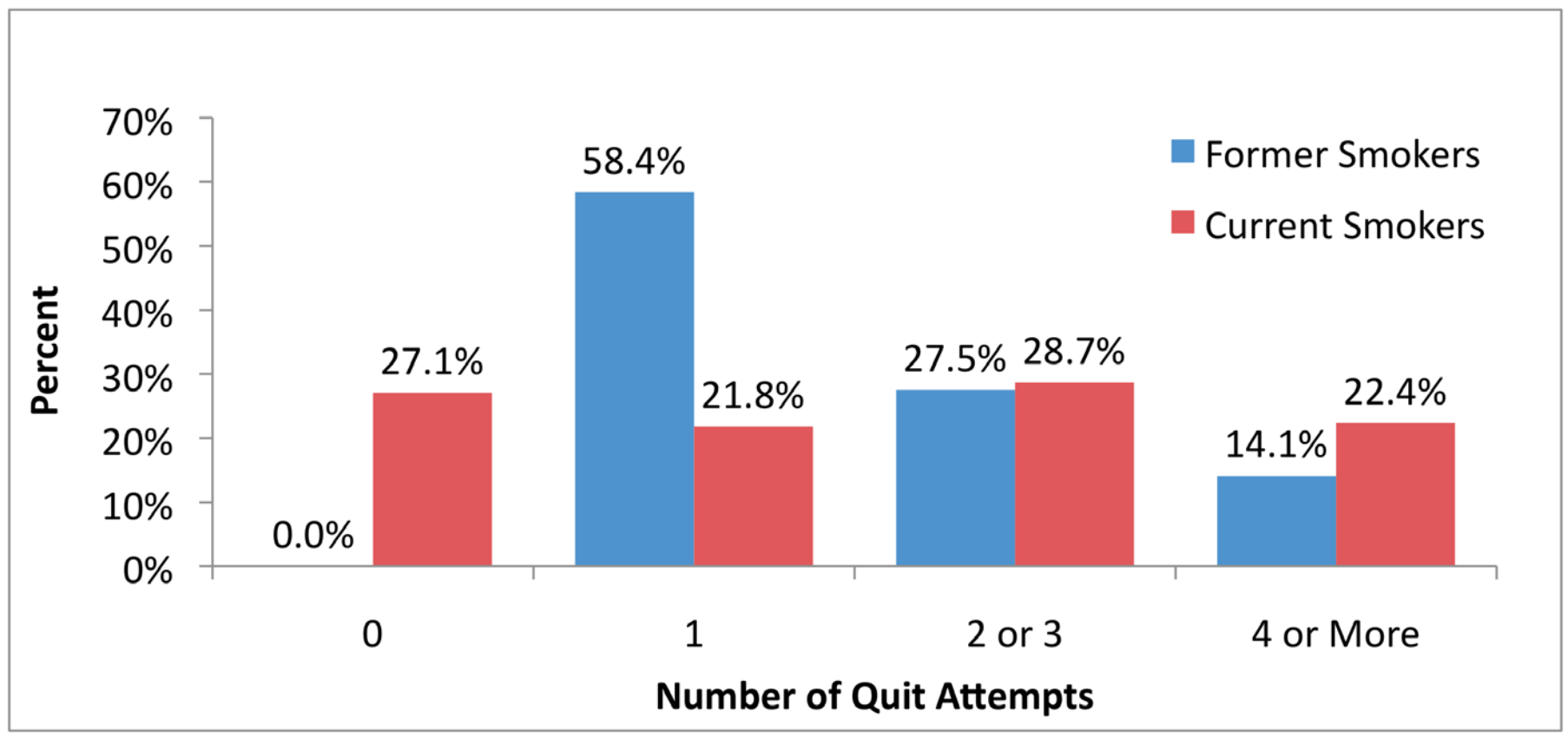
- ASK — Systematically identify all tobacco users at every visit
- ADVISE — Strongly urge all tobacco users to quit
- ASSESS — Determine willingness to make a quit attempt
- ASSIST — Aid the patient in quitting
- ARRANGE — Schedule follow-up contact

Sustained Quitters Had Lowest Mortality



Anthonisen NR, et al. *Ann Intern Med*. 2005;142(4):233-239.

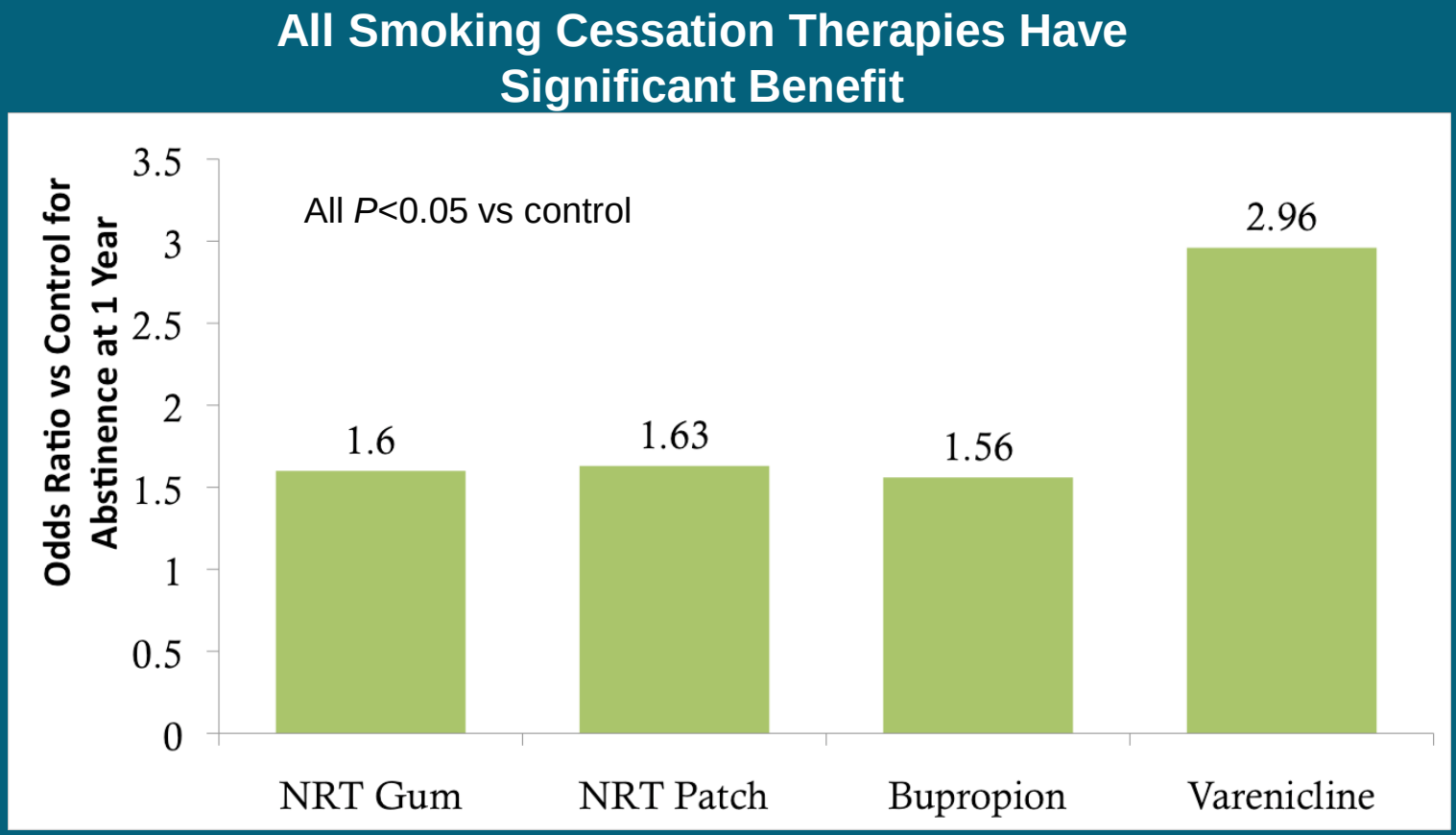
Smoking Cessation Requires Multiple Attempts (8 on Average)



Fiore MC, et al. Treating tobacco use and dependence: 2008 Update-Clincial Practice Guideline, US Department of Health and Human Services, 2008

John U, et al. *Prev Med.* 2004; 38(3):350-358.

Pharmacotherapy for Smoking Cessation



NRT = Nicotine replacement therapy.

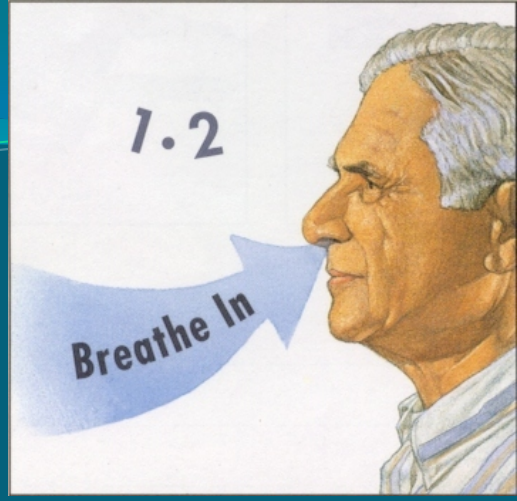
Wu P, et al. *BMC Public Health.* 2006;6:300-315. Accessed 1-28-2011

ACCP's Tobacco Dependence Treatment Toolkit

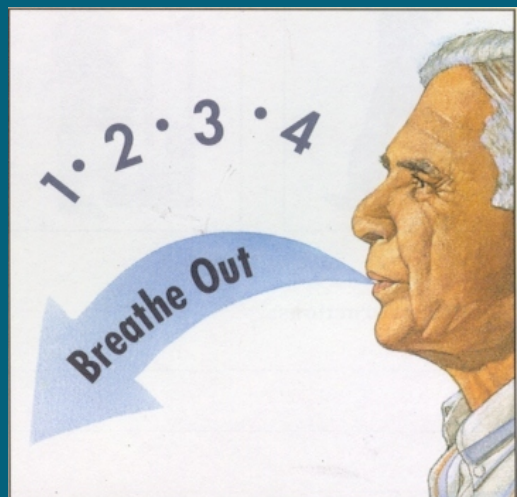
A complete online resource for you and your patients

Visit http://tobaccodependence.chestnet.org

COPD Education Topics



- Pulmonary rehabilitation
- Maintain proper nutritional status
- Conserve energy and control stress
- Control breathing
- Oxygen therapy
- Support groups – Better Breathers Club



Global Initiative for Chronic Obstructive Lung Disease

GLOBAL STRATEGY FOR THE DIAGNOSIS, MANAGEMENT, AND PREVENTION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Definition and Overview

OVERALL KEY POINTS (1 of 2):

- Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.

- The most common respiratory symptoms include dyspnea, cough and/or sputum production. These symptoms may be under-reported by patients.

- The main risk factor for COPD is tobacco smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute.

Definition and Overview

OVERALL KEY POINTS (2 of 2):

- Besides exposures, host factors predispose individuals to develop COPD. These include genetic abnormalities, abnormal lung development and accelerated aging.
- COPD may be punctuated by periods of acute worsening of respiratory symptoms, called exacerbations.
- In most patients, COPD is associated with significant concomitant chronic diseases, which increase its morbidity and mortality.

Diagnosis of COPD

SYMPTOMS

Shortness of breath

Chronic cough

Sputum

EXPOSURE TO RISK FACTORS

Host factors

Tobacco

Occupation

Indoor/outdoor pollution

SPIROMETRY: Required to establish diagnosis

Diagnosis and Initial Assessment

- Symptoms of COPD
  - Chronic and progressive dyspnea
  - Cough
  - Sputum production
  - Wheezing and chest tightness
  - Others – including fatigue, weight loss, anorexia, syncope, rib fractures, ankle swelling, depression, anxiety.

Medical History

- Patient's exposure to risk factors
- Past medical history
- 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
- Impact of disease on patient's life
- Social and family support available to the patient.
- Possibilities for reducing risk factors, especially smoking cessation.

Spirometry

Figure 2.2A. Spirometry – Normal Trace

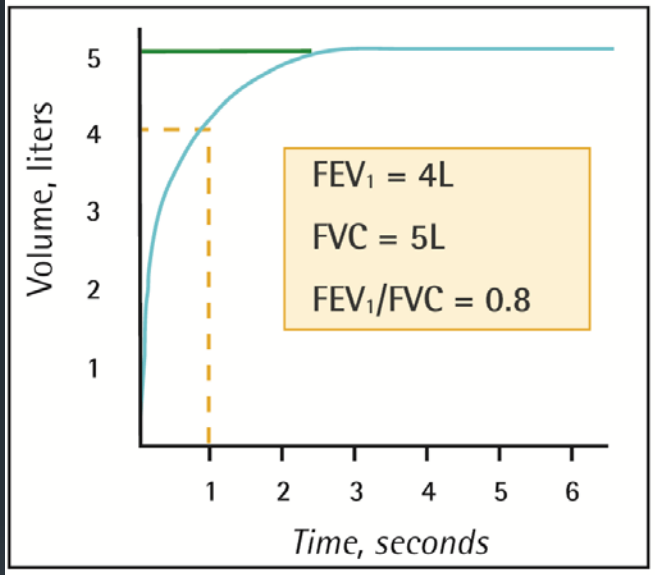
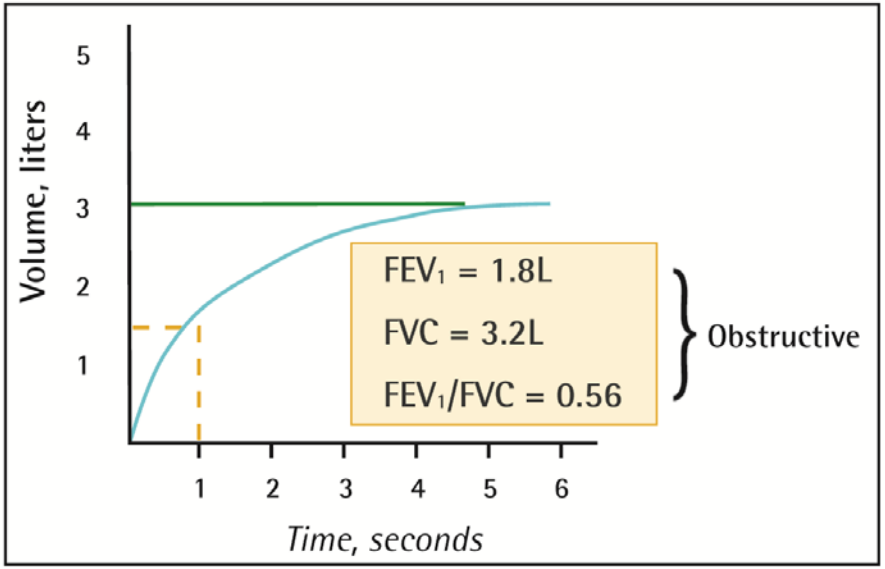


Figure 2.2B. Spirometry – Obstructive Disease



FVC =

FEV_1 =

Classification of severity of airflow limitation

Table 2.4. Classification of airflow limitation severity in COPD (Based on post-bronchodilator FEV_1)		
In patients with $FEV_1/FVC < 0.70$:		
GOLD 1:	Mild	$FEV_1 \geq 80\%$ predicted
GOLD 2:	Moderate	$50\% \leq FEV_1 < 80\%$ predicted
GOLD 3:	Severe	$30\% \leq FEV_1 < 50\%$ predicted
GOLD 4:	Very Severe	$FEV_1 < 30\%$ predicted

Choice of thresholds

- COPD Assessment Test (CAT ™)
- Chronic Respiratory Questionnaire (CCQ®)
- St George's Respiratory Questionnaire (SGRQ)
- Chronic Respiratory Questionnaire (CRQ)
- Modified Medical Research Council (mMRC) questionnaire

Figure 2.3. CAT Assessment

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

Example: I am very happy 0 ✗ 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

Reference: Jones et al. ERJ 2009; 34 (3); 648-54.

Table 2.5. Modified MRC dyspnea scale[a]

PLEASE TICK IN THE BOX THAT APPLIES TO YOU (ONE BOX ONLY) (Grades 0–4)

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

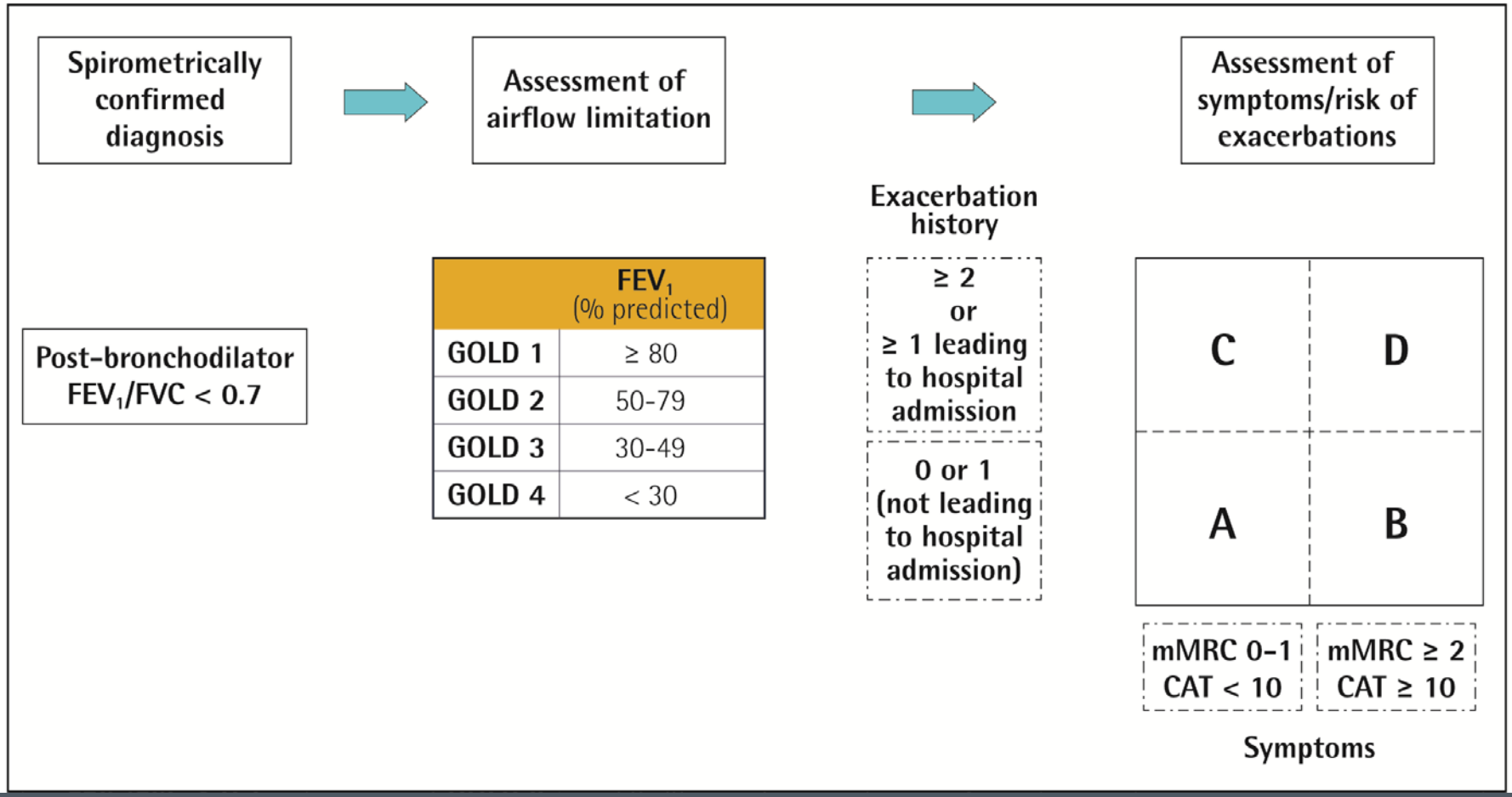
[a] Fletcher CM. BMJ 1960; 2: 1662.

Assessment of Exacerbation Risk

- COPD exacerbations are defined as an acute worsening of respiratory symptoms that result in additional therapy.
- Classified as:
  - Mild (treated with SABDs only)
  - Moderate (treated with SABDs plus antibiotics and/or oral corticosteroids) or
  - Severe (patient requires hospitalization or visits the emergency room). Severe exacerbations may also be associated with acute respiratory failure.
- Blood eosinophil count may also predict exacerbation rates (in patients treated with LABA without ICS).

ABCD Assessment Tool

Figure 2.4. The refined ABCD assessment tool



ABCD Assessment Tool

Example

- Consider two patients:
  - Both patients with FEV_1 < 30% of predicted
  - Both with CAT scores of 18
  - But, one with 0 exacerbations in the past year and the other with 3 exacerbations in the past year.

- Both would have been labelled GOLD D in the prior classification scheme.
- With the new proposed scheme, the subject with 3 exacerbations in the past year would be labelled GOLD grade 4, group D.
- The other patient, who has had no exacerbations, would be classified as GOLD grade 4, group B.

Summary

Table 2.6. Role of spirometry

- **Diagnosis**
- **Assessment of severity of airflow obstruction (for prognosis)**
- **Follow-up assessment**
  - » Therapeutic decisions.
    - – Pharmacological in selected circumstances (e.g., discrepancy between spirometry and level of symptoms).
    - – Consider alternative diagnoses when symptoms are disproportionate to degree of airflow obstruction.
    - – Non-pharmacological (e.g., interventional procedures).
  - » Identification of rapid decline.

Differential Diagnosis

Table 2.7. Differential diagnosis of COPD	
Diagnosis	**Suggestive Features**
COPD	Onset in mid-life. Symptoms slowly progressive. History of tobacco smoking or exposure to other types of smoke.
Asthma	Onset early in life (often childhood). Symptoms vary widely from day to day. Symptoms worse at night/early morning. Allergy, rhinitis, and/or eczema also present. Family history of asthma. Obesity coexistence.
Congestive Heart Failure	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. Chest X-ray/CT shows bronchial dilation, bronchial wall thickening.
Tuberculosis	Onset all ages. Chest X-ray shows lung infiltrate. Microbiological confirmation. High local prevalence of tuberculosis.
Obliterative Bronchiolitis	Onset at younger age, nonsmokers. May have history of rheumatoid arthritis or acute fume exposure. Seen after lung or bone marrow transplantation. CT on expiration shows hypodense areas.
Diffuse Panbronchiolitis	Predominantly seen in patients of Asian descent. Most patients are male and nonsmokers. Almost all have chronic sinusitis. Chest X-ray and HRCT show diffuse small centrilobular nodular opacities and hyperinflation.
These features tend to be characteristic of the respective diseases, but are not mandatory. For example, a person who has never smoked may develop COPD (especially in the developing world where other risk factors may be more important than cigarette smoking); asthma may develop in adult and even in elderly patients.	

Management of Stable COPD

OVERALL KEY POINTS:

- The management strategy for stable COPD should be predominantly based on the individualized assessment of symptoms and future risk of exacerbations.
- All individuals who smoke should be strongly encouraged and supported to quit.
- The main treatment goals are reduction of symptoms and future risk of exacerbations.
- Management strategies are not limited to pharmacologic treatments, and should be complemented by appropriate non-pharmacologic interventions.

Management of Stable COPD

- Once COPD has been diagnosed, effective management should be based on an individualized assessment to reduce both current symptoms and future risks of exacerbations.

Table 4.1. Goals for treatment of stable COPD

- Relieve symptoms
- Improve exercise tolerance
- Improve health status

→ REDUCE SYMPTOMS

and

- Prevent disease progression
- Prevent and treat exacerbations
- Reduce mortality

→ REDUCE RISK

Management of Stable COPD

Identify and reduce exposure to known risk factors

- Identification and reduction of exposure to risk factors is important in the treatment and prevention of COPD.
- Cigarette smoking is the most commonly encountered and easily identifiable risk factor for COPD, and smoking cessation should be continually encouraged for all individuals who smoke.
- Reduction of total personal exposure to occupational dusts, fumes, and gases, and to indoor and outdoor air pollutants, should also be addressed.

Table 4.3. Identify and reduce risk factor exposure
• Smoking cessation interventions should be actively pursued in all COPD patients **(Evidence A)**.
• Efficient ventilation, non-polluting cooking stoves and similar interventions should be recommended **(Evidence B)**.
• Clinicians should advise patients to avoid continued exposures to potential irritants, if possible **(Evidence D)**.

Treatment of Stable COPD

Pharmacologic treatment

- Pharmacologic therapies can reduce symptoms, and the risk and severity of exacerbations, as well as improve health status and exercise tolerance.
- Most of the drugs are inhaled so proper inhaler technique is of high relevance.

Table 4.4. Key points for inhalation of drugs

- The choice of inhaler device has to be individually tailored and will depend on access, cost, prescriber, and most importantly, patient's ability and preference.
- It is essential to provide instructions and to demonstrate the proper inhalation technique when prescribing a device, to ensure that inhaler technique is adequate and re-check at each visit that patients continue to use their inhaler correctly.
- Inhaler technique (and adherence to therapy) should be assessed before concluding that the current therapy requires modification.

Pharmacologic Therapy

Table 3.3. Commonly used maintenance medications in COPD*

Drug	Inhaler (mcg)	Solution for nebulizer (mg/ml)	Oral	Vials for injection (mg)	Duration of action (hours)
Beta$_2$-agonists					
Short-acting					
Fenoterol	100-200 (MDI)	1	2.5 mg (pill), 0.05% (syrup)		4-6
Levalbuterol	45-90 (MDI)	0.1, 0.21, 0.25, 0.42			6-8
Salbutamol (albuterol)	90, 100, 200 (MDI & DPI)†	1, 2, 2.5, 5 mg/ml	2, 4, 5 mg (pill), 8 mg (extended release tablet) 0.024%/0.4 mg (syrup)	0.1, 0.5 mg	4-6, 12 (extended release)
Terbutaline	500 (DPI)		2.5, 5 mg (pill)	0.2, 0.25, 1 mg	4-6
Long-acting					
Arformoterol		0.0075†			12
Formoterol	4.5-9 (DPI)	0.01^			12
Indacaterol	75-300 (DPI)				24
Olodaterol	2.5, 5 (SMI)				24
Salmeterol	25-50 (MDI & DPI)				12
Anticholinergics					
Short-acting					
Ipratropium bromide	20, 40 (MDI)	0.2			6-8
Oxitropium bromide	100 (MDI)				7-9
Long-acting					
Aclidinium bromide	400 (DPI), 400 (MDI)				12
Glycopyrronium bromide	15.6 & 50 (DPI)‡		1 mg (solution)	0.2 mg	12-24
Tiotropium	18 (DPI), 2.5 & 5 (SMI)				24
Umeclidinium	62.5 (DPI)				24
Combination of short-acting beta$_2$-agonist plus anticholinergic in one device					
Fenoterol/ipratropium	50/20 (SMI)	1.25, 0.5 mg in 4ml			6-8
Salbutamol/ipratropium	100/20 (SMI), 75/15 (MDI)	0.5, 2.5 mg in 3ml			6-8

Pharmacologic Therapy

Combination of long-acting beta$_2$-agonist plus anticholinergic in one device				
Formoterol/aclidinium	12/400 (DPI)			12
Formoterol/glycopyrronium	9.6/18 (MDI)			12
Indacaterol/glycopyrronium	27.5/15.6 & 110/50 (DPI)*			12-24
Vilanterol/umeclidinium	25/62.5 (DPI)			24
Olodaterol/tiotropium	5/5 (SMI)			24
Methylxanthines				
Aminophylline		105 mg/ml (solution)	250, 500 mg	Variable, up to 24
Theophylline (SR)		100-600 mg (pill)	250, 400, 500 mg	Variable, up to 24
Combination of long-acting beta$_2$-agonist plus corticosteroids in one device				
Formoterol/beclomethasone	6/100 (MDI)			
Formoterol/budesonide	4.5/160 (MDI), 4.5/80 (MDI), 9/320 (DPI), 9/160 (DPI)			
Formoterol/mometasone	10/200, 10/400 (MDI)			
Salmeterol/fluticasone	5/100, 50/250, 5/500 (DPI), 21/45, 21/115, 21/230 (MDI)			
Vilanterol/fluticasone furoate	25/100 (DPI)			
Phosphodiesterase-4 inhibitors				
Roflumilast		500 mcg (pill)		

MDI = metered dose inhaler; DPI = dry powder inhaler; SMI = soft mist inhaler

* Not all formulations are available in all countries; in some countries other formulations and dosages may be available

† Dose availability varies by country

‡ Formoterol nebulized solution is based on the unit dose vial containing 20 mcg in a volume of 2.0 ml

§ Dose varies by country

Questions?

- Call: 616-464-4816
- Email: Karen.Meyerson@priorityhealth.com
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