

COPD: Current Medical Therapy

Angela Golden, DNP, FNP-C, FAANP
Owner, NP from Home, LLC

Outcomes

- As a result of this activity, learners will be able to:
 1. List the appropriate classes of medications for treatment of COPD
 2. Describe the process for selecting specific medications for COPD patients
 3. Explain diagnostics role in determining medication therapy

Disclosures

- AANP is a member of the COPD Alliance



COPD recognition

- A preventable and treatable disease state:
 - Characterized by airflow limitation that is partially reversible
 - Confirmed by postbronchodilator spirometry
 - Associated with an abnormal inflammatory response to noxious particles or gases
 - Associated with significant extrapulmonary effects and important comorbid conditions

Risk Factors

Evaluate for symptoms if indicators are present in an individual over age 40:

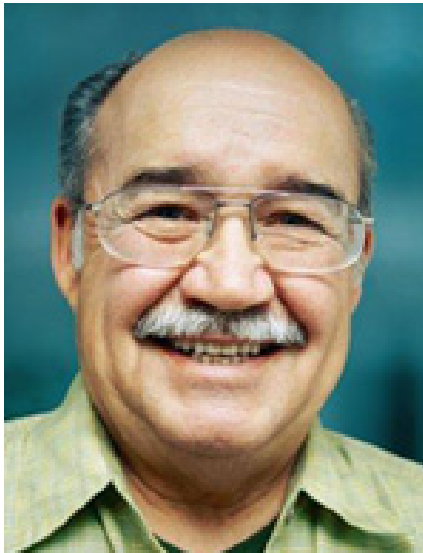
- History of tobacco smoke exposure
- Exposure to occupational dusts and chemicals
- Exposure to smoke from home cooking and heating fuels
- Patients with known coronary artery disease, especially if they are a current or former smoker

Symptoms and Diagnosis

- Symptoms to look for:
 - Dyspnea that is often worse with exertion
 - Chronic cough (may be intermittent and nonproductive)
 - Chronic sputum
- COPD is confirmed by performing postbronchodilator spirometry

COPD in Younger Patients and Women Is on the Rise

Reality



- Reality: working-age population
- Reality: disease of women

Prevalence of Alpha-1 Antitrypsin Deficiency in Patients With COPD

Early-onset COPD (≤ 45 years of age)

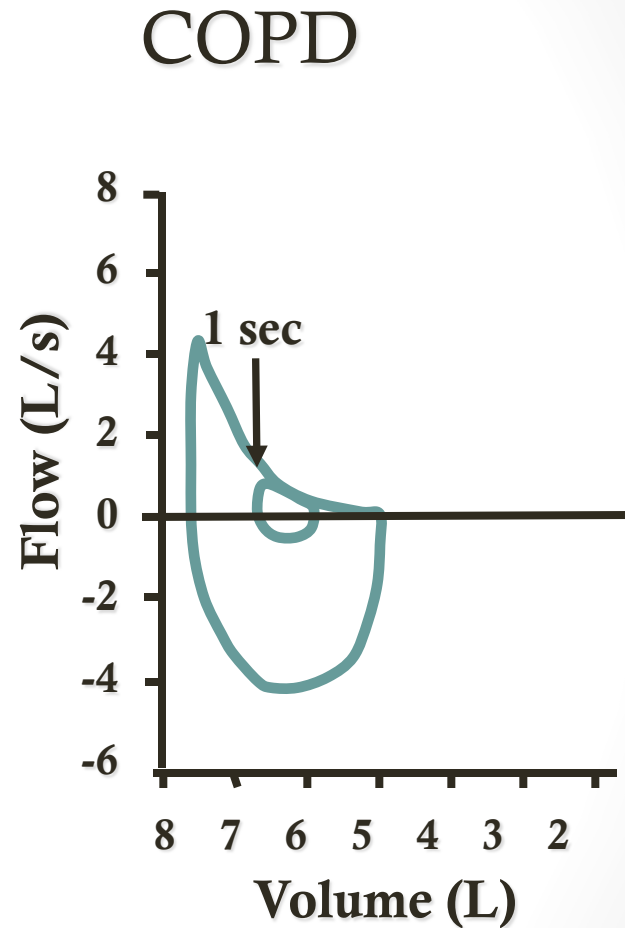
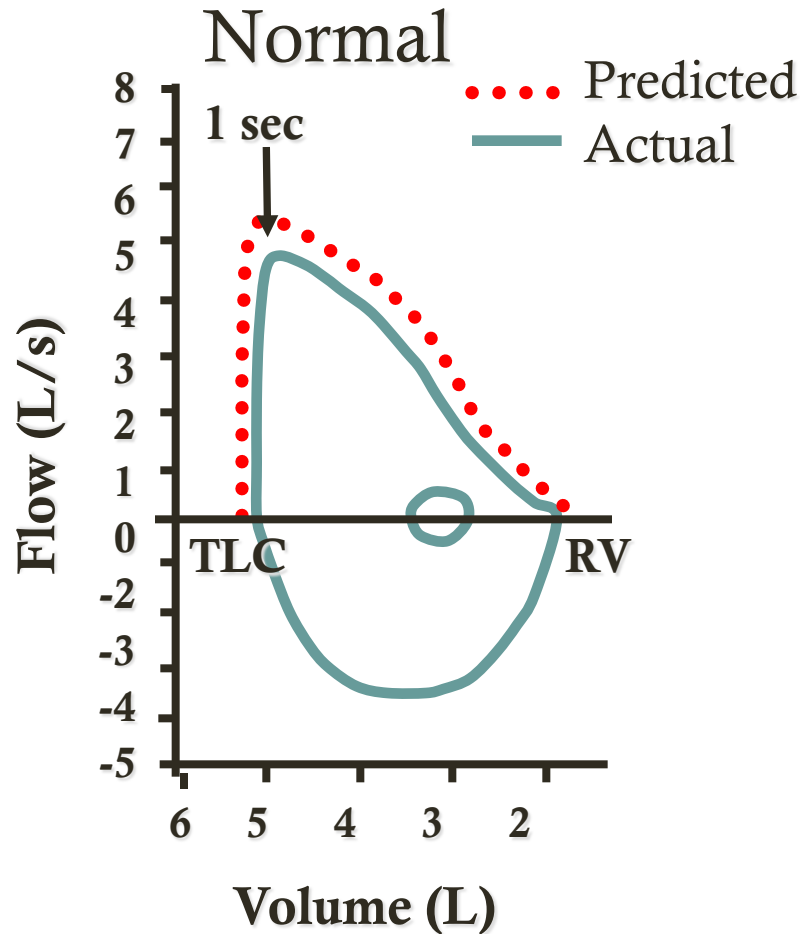
COPD in the absence of a recognized risk factor (smoking, occupational dust exposure, etc)

Radiograph with hyperlucent (black) lower lobes

Otherwise unexplained liver disease

Family history of any of the following: emphysema, bronchiectasis, or liver disease

Flow Volume Loops



Staging

- Assess symptoms
- Assess degree of airflow limitation using spirometry
- Assess risk of exacerbations

ASSESS SYMPTOMS

Global Strategy for Diagnosis, Management and Prevention of COPD

Modified MRC (mMRC) Questionnaire

PLEASE TICK IN THE BOX THAT APPLIES TO YOU
(ONE BOX ONLY)

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.

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.

If you wish to complete the questionnaire by hand on paper, [please click here](#) and then print the questionnaire.

If you complete the questionnaire on-line, for each question below, click your mouse to place a mark (X) in the box that best describes you currently.

Example: I am very happy 0 1 2 3 4 5 I am sad

			SCORE
I never cough	0 1 2 3 4 5	I cough all the time	<input type="text"/>
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is full of phlegm (mucus)	<input type="text"/>
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	<input type="text"/>
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	<input type="text"/>
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	<input type="text"/>
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	<input type="text"/>
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	<input type="text"/>
I have lots of energy	0 1 2 3 4 5	I have no energy at all	<input type="text"/>
			<input type="text"/>

**CLICK TO GET YOUR
TOTAL SCORE!**

ASSESS DEGREE OF AIRFLOW

Airflow

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
- **Based on Post-Bronchodilator*

Assess Exacerbations Risk

- Two exacerbations or more within the last year = high risk
- $FEV_1 < 50\%$ of predicted value are indicators of high risk.

Combined Assessment of COPD

Patient	Characteristic	Spirometric Classification	Exacerbations per year	mMRC	CAT
A	Low Risk Less Symptoms	GOLD 1-2	≤ 1	0-1	< 10
B	Low Risk More Symptoms	GOLD 1-2	≤ 1	≥ 2	≥ 10
C	High Risk Less Symptoms	GOLD 3-4	≥ 2	0-1	< 10
D	High Risk More Symptoms	GOLD 3-4	≥ 2	≥ 2	≥ 10

TREATMENT

Goals of Therapy

- REDUCE SYMPTOMS
 - Relieve symptoms
 - Improve exercise tolerance
 - Improve health status
- REDUCE RISKS
 - Prevent disease progression
 - Prevent and treat exacerbations
 - Reduce mortality



Nonpharmacologic Therapy to Manage COPD

Smoking Cessation



Patient Education



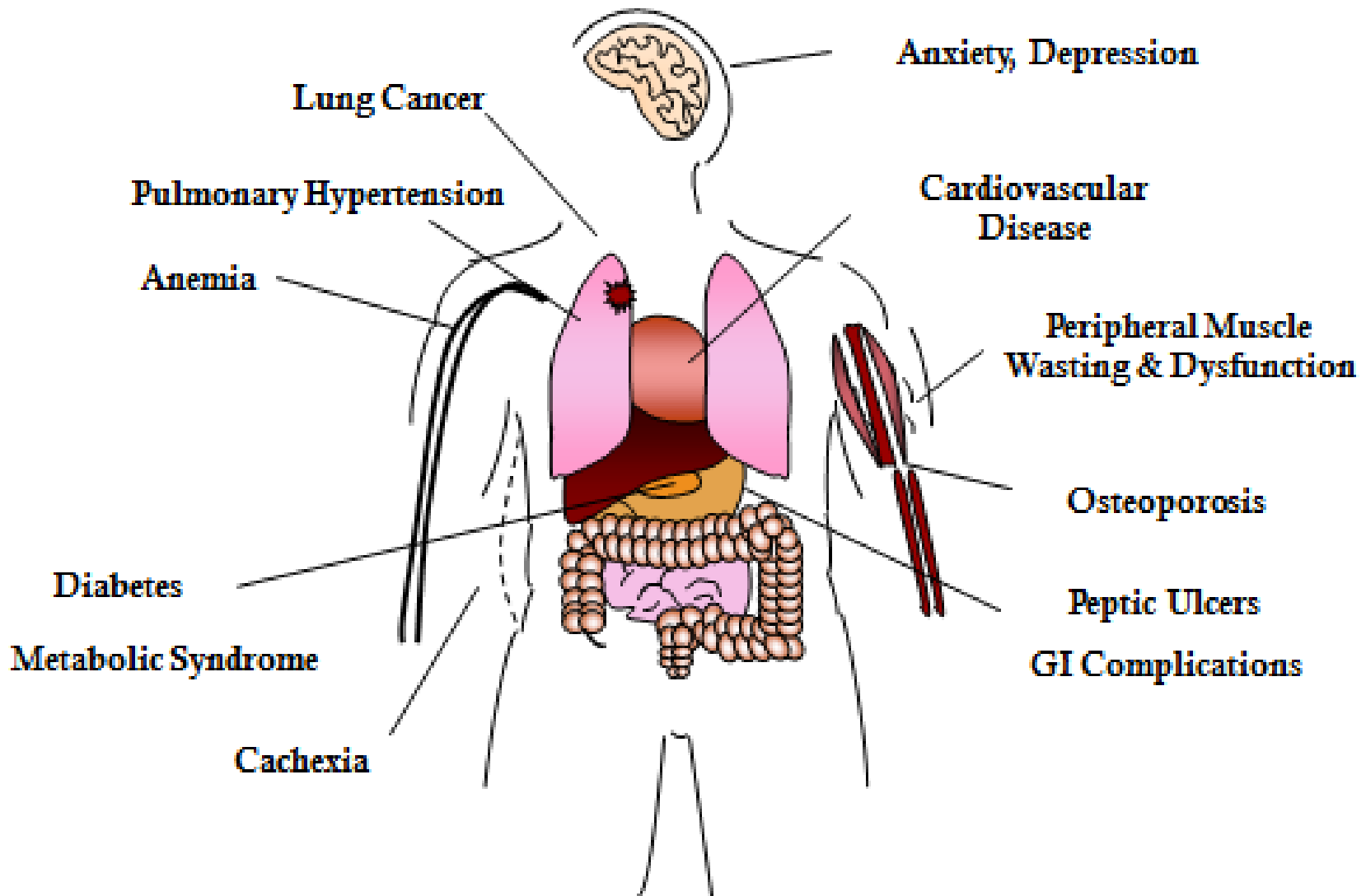
Pulmonary Rehabilitation



Surgical and Non-surgical Alternatives



Address Comorbidities of COPD



Adapted from Kao C, Hanania NA. Atlas of COPD, 2008.

Pharmacologic Therapy

Patient	Recommended First choice	Alternative choice
A	SAMA prn <i>or</i> SABA prn	LAMA <i>or</i> LABA <i>or</i> SABA and SAMA
B	LAMA <i>or</i> LABA	LAMA and LABA
C	ICS + LABA <i>or</i> LAMA	LAMA and LABA <i>or</i> LAMA and PDE4-inh. <i>or</i> LABA and PDE4-inh.
D	ICS + LABA <i>and/or</i> LAMA	ICS + LABA and LAMA <i>or</i> ICS+LABA and PDE4-inh. <i>or</i> LAMA and LABA <i>or</i> LAMA and PDE4-inh.

Pharmacologic Categories

- **Bronchodilators**
 - Beta-agonists
 - Short-Acting
 - Long-Acting
 - Anticholinergics/Muscarinics
 - Short-Acting
 - Long-Acting
- **Corticosteroids**

Bronchodilators

- Beta Agonists
 - Short acting beta agonists (SABA)
 - Fenoterol
 - Levalbuterol
 - Albuterol
 - Terbutaline
 - Long acting beta agonists (LABA)
 - Formoterol
 - Salmeterol



Bronchodilators

- Anticholinergics
 - Short acting
 - Ipratropium
 - Long acting
 - Tiotropium
 - Aclidinium



Corticosteroids

- Inhaled
 - Associated with risk of pneumonia
 - Monotherapy is not recommended
- Oral
 - Chronic treatment with systemic corticosteroids should be avoided because of an unfavorable benefit-to-risk

Combinations

- SABA + anticholinergic
 - Salbutamol/Ipratropium
- LABA + corticosteroid
 - Formoterol/budesonide
 - Formoterol/mometasone
 - Salmeterol/fluticasone



Other

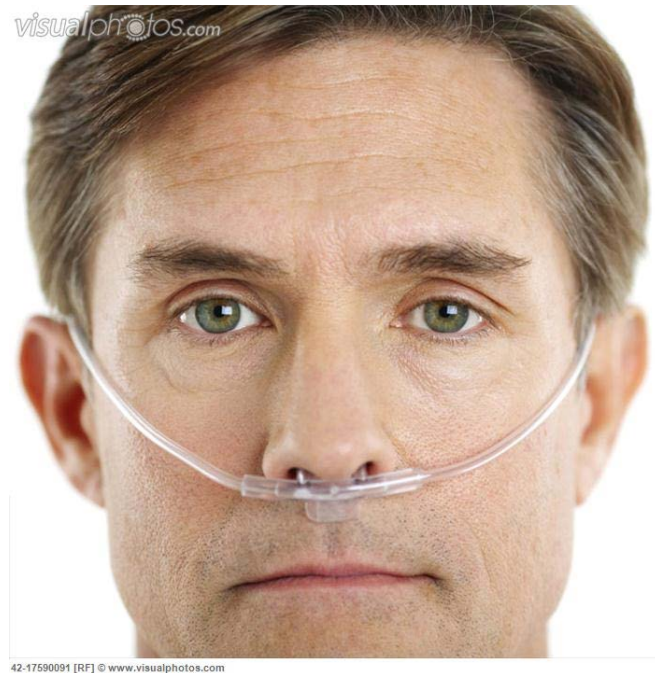
- Phosphodiesterase-4 inhibitor - romflumilast
- Influenza and pneumococcal vaccination should be offered depending on local guidelines



Indications for Supplemental Oxygen Therapy

Benefit for patients with:

- Less severe resting hypoxemia
- Desaturation during exercise ($\text{SaO}_2 \leq 88\%$)
- Desaturation during sleep ($\text{SaO}_2 \leq 88\%$)



What not to use

- Mucolytics +/-
- Antitussives – not recommended
- Antibiotics



Pulmonary Rehabilitation

- Moderate to very severe COPD
- Indications
 - Anxiety with activity
 - Breathlessness
 - Limitations with activity
 - Loss of independence
- Essential components
 - Education
 - Exercise training
 - Psychosocial/behavioral
 - Nutrition counseling

Cases

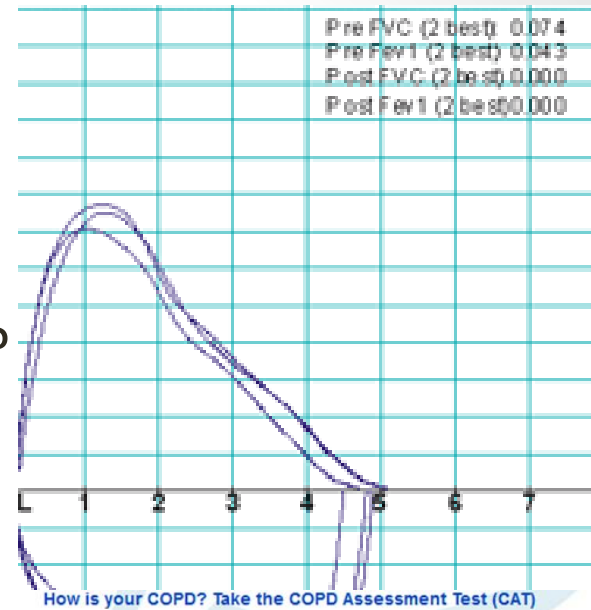
Case 1

- Marvin is a 47-year-old smoker with 3 weeks of dyspnea and cough productive of yellow sputum.
 - Upon initial questioning, he denied any shortness of breath or cough prior to 3 weeks ago.
 - With further questioning, he stated that he wasn't able to do as much at his construction job because he is "getting old" (short of breath).
 - He initially denied cough but admitted to sputum each morning from his "smokers' cough."
 - Has a 30 pack year history of smoking
 - No fever/chills, denies other symptoms
 - No hospitalizations in past year

Case 1 questions

- What are the next steps for this patient?
- Need to make the diagnosis
 - Post Bronchodilator Spirometry results
 - FEV₁/FVC 0.65
 - FEV₁ 80%
- Need to stage patient
 - GOLD 1
 - Exacerbations < 1
 - Symptoms – CAT – 9

GOLD A



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.

If you wish to complete the questionnaire by hand on paper, [please click here](#) and then print the questionnaire. If you complete the questionnaire on-line, for each question below, click your mouse to place a mark (X) in the box that best describes you currently.

Example: I am very happy (0) (1) (2) (3) (4) (5) I am sad

	SCORE
I never cough (0) <input checked="" type="radio"/> (1) (2) (3) (4) (5) I cough all the time	
I have no phlegm (mucus) in my chest at all (0) <input checked="" type="radio"/> (1) (2) (3) (4) (5) My chest is full of phlegm (mucus)	
My chest does not feel tight at all (0) <input checked="" type="radio"/> (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) <input checked="" type="radio"/> (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) <input checked="" type="radio"/> (1) (2) (3) (4) (5) I am very limited doing activities at home	
I am confident leaving my home despite my lung condition (0) <input checked="" type="radio"/> (1) (2) (3) (4) (5) I am not at all confident leaving my home because of my lung condition	
I sleep soundly (0) <input checked="" type="radio"/> (1) (2) (3) (4) (5) I don't sleep soundly because of my lung condition	
I have lots of energy (0) <input checked="" type="radio"/> (1) (2) (3) (4) (5) I have no energy at all	

CLICK TO GET YOUR TOTAL SCORE!

Case 1 treatment

- GOLD A
- Recommendation to start with
 - Short acting bronchodilator – either anticholinergic or beta-agonist used prn

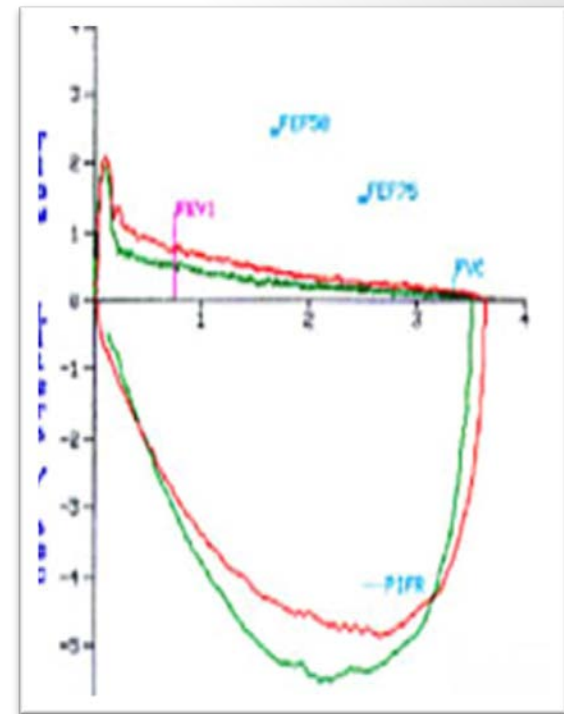
Case 2

- Kathy is a 62-year-old woman with a 42 pack-year history of tobacco, diabetes, depression, hypertension, and heart failure was diagnosed with “asthma” 2 years ago.
 - Dyspnea slowly progressive
 - Chronic daily cough (does not interfere with sleep)
 - No known triggers (such as perfume, etc)
 - No family history of asthma
 - No history of childhood asthma

Case 2 questions

- What are the next steps for this patient?
- Need to make the diagnosis
 - Post Bronchodilator Spirometry results
 - FEV_1/FVC 0.45
 - FEV_1 45%
- Need to stage patient
 - GOLD 3
 - Exacerbations 1 plus $FEV_1 < 50\%$
 - Symptoms –mMRC – 3

GOLD D



PLEASE TICK IN THE BOX THAT APPLIES TO YOU
(ONE BOX ONLY)

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.

Case 2 treatment

- GOLD D
- Education on COPD
- Medication management
 - First line choices ICS + LABA *and/or* LAMA
 - This patient has been receiving Ventolin MDI, but daughter has to help her and she has needed it 2-3 times a day (per her daughter report)
 - Explain the rescue use of the SABA, considering changing this to nebulizer
 - Start a combination of LABA + ICS – formoterol/budesonide (Symbicort) or salmeterol/fluticasone (Advair)
- Assure the comorbidities are undercontrol
- Pulmonary Rehabilitation
- Offer low-dose CT
- At recheck if symptoms are still significant
 - Evaluate inhaler technique and use
 - consider adding LAMA – tiotropium (Spiriva) or PDE-4 inhibitor – roflumilast (Daliresp)



Inhaler Device Selection

- Suboptimal use in technique leads to suboptimal health outcomes
- Types of inhalers
 - pMDI's +/- spacer
 - DPIs
 - nebulizers
- Elderly patients
 - Cognitive function
- Other considerations
 - Hand breath coordination
 - Manual dexterity
 - Hand strength
 - Breath activation
 - Multiple types of inhalers
- COST



Questions

References

- Global Institute for Chronic Obstructive Lung Disease (GOLD), 2013 update, available at <http://goldcopd.com>
- Mannino, et al. *MMWR*. 2002;51(1)(6 suppl):1-13
- ATS/ERS Standards. *Am J Respir Crit Care Med*. 2003; 168:818-900