

Chronic Obstructive Pulmonary Disorder (COPD): A Breathless Update

LTC Douglas Maurer, DO, MPH, FAAFP



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Learning Objectives

1. Examined COPD diagnosis and assessment.
2. Discussed treatment of stable COPD.
3. Evaluated treatment of acute exacerbations.
4. Reviewed the latest COPD evidence.



Audience Engagement System

The image shows three sequential screenshots of the Audience Engagement System app. Step 1 is the home screen with various icons for navigation. Step 2 shows a list of CME events, with a red arrow pointing to a specific event. Step 3 shows the details for the selected event, including the title 'CME011 Acute Coronary Syndromes: Unchain My Heart' and other relevant information.



Disclosures

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Practice Recommendations

- Must have spirometry for COPD diagnosis
- Long acting bronchodilators (LABAs/LAMAs) 1st
- Add inhaled corticosteroids if LABAs/LAMAs fail
- Prednisone 40mg x 5 days for exacerbations
- Non-invasive ventilation for severe exacerbations

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2016 GOLD Guideline Updates



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COPD Defined

- “Common preventable and treatable disease, characterized by airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. Exacerbations and comorbidities contribute to the overall severity in patients.”
- Causes: tobacco smoke, air pollution, occupational dusts and chemicals, genetic

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AES Poll Question #1

Spirometry is required to make a diagnosis of COPD?

- A. True
- B. False

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COPD Diagnosis

- Consider if: dyspnea, chronic cough, sputum, and risk factors (smoking, family history, etc.)
- Spirometry required for diagnosis
- USPSTF does not rec screening for COPD in asymptomatic adults (D)
- GOLD advocates “active case finding”

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AES Poll Question #2

Which of the following spirometry results is consistent with a COPD diagnosis?

- A. Postbronchodilator $FEV_1/FVC < 90\%$
- B. Postbronchodilator $FEV_1/FVC < 80\%$
- C. Postbronchodilator $FEV_1/FVC < 70\%$
- D. Non-reversible obstruction of at least 20% FEV1
- E. Non-reversible obstruction of at least 10% FEV1

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Spirometry Categories

- Positive: postbronchodilator $FEV_1/FVC < 70\%$
- 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

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AES Poll Question #3

Assessment of the COPD patient per the 2016 GOLD guidelines includes all of the following EXCEPT?

- A. Symptoms
- B. Spirometry
- C. Medications
- D. Exacerbation risk
- E. Comorbidities

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Assessment of COPD

Step 1: Symptoms: various questionnaires

Step 2: Airflow limitation: spirometry (GOLD 1-4)

Step 3: Risk of exacerbations: low or high

Step 4: Comorbidities: various

Combined assessment: Grade A-D

Global Strategy for Diagnosis, Management, and Prevention of COPD
 Updated January 2015. http://www.goldcopd.org/uploads/users/files/GOLD_Report_2015.pdf. Accessed February 24, 2015.

Step 1: Assess Symptoms

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		SCORE
I never cough	0 1 2 3 4 5	3
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	1
My chest does not feel tight at all	0 1 2 3 4 5	4
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	5
I am not limited doing any activities at home	0 1 2 3 4 5	2
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	1
I sleep soundly	0 1 2 3 4 5	4
I have lots of energy	0 1 2 3 4 5	3
I cough all the time		
My chest is full of phlegm (mucus)		
My chest feels very tight		
When I walk up a hill or one flight of stairs I am very breathless		
I am very limited doing activities at home		
I am not at all confident leaving my home because of my lung condition		
I don't sleep soundly because of my lung condition		
I have no energy at all		
CLICK TO GET YOUR TOTAL SCORE!		23

<http://www.catestonline.org/>

CLINICAL COPD QUESTIONNAIRE

Please circle the number of the response that best describes how you have been feeling during the past week.
(Only one response for each question)

On average, during the past week, how often did you feel?	never	hardly ever	a few times	several times	Many Times	a great many times	almost all the time
1. Short of breath at rest?	0	1	2	3	4	5	6
2. Short of breath doing physical activities?	0	1	2	3	4	5	6
3. Concerned about getting a cold or your breathing getting worse?	0	1	2	3	4	5	6
4. Depressed (down) because of your breathing problems?	0	1	2	3	4	5	6
In general, during the past week, how much of the time:							
5. Did you cough?	0	1	2	3	4	5	6
6. Did you produce phlegm?	0	1	2	3	4	5	6
On average, during the past week, how limited were you in doing activities because of your breathing problems?	not limited at all	very slightly limited	slightly limited	moderately limited	very limited	extremely limited	totally limited or unable to do
7. Strenuous physical activities (such as climbing stairs, housework, carrying things)?	0	1	2	3	4	5	6
8. Moderate physical activities (such as walking, housework, carrying things)?	0	1	2	3	4	5	6
9. Daily activities at home (such as dressing, washing yourself)?	0	1	2	3	4	5	6
10. Social activities (such as talking, being with children, visiting friends/relatives)?	0	1	2	3	4	5	6

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The MRC Breathlessness Scale

Grade	Degree of breathlessness related to activities
1	Not troubled by breathlessness except on strenuous exercise
2	Short of breath when hurrying on the level or walking up a slight hill
3	Walks slower than most people on the level, stops after a mile or so, or stops after 15 minutes walking at own pace
4	Stops for breath after walking about 100 yds or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when undressing

Step 2: Spirometry



Spirometry Categories

- Positive: postbronchodilator FEV₁/FVC < 70%
- GOLD 1: mild, FEV₁ ≥ 80% predicted
- GOLD 2: moderate, 50% ≤ FEV₁ < 80% predicted
- GOLD 3: severe, 30% ≤ FEV₁ < 50% predicted
- GOLD 4: very severe, FEV₁ < 30% predicted



Step 3: Risk of Exacerbations



Assess Exacerbation Risk

- Low risk: 0-1 exacerbations per year
- High risk: 2 or more exacerbations per year OR FEV₁ < 50%



Step 4: Comorbidities

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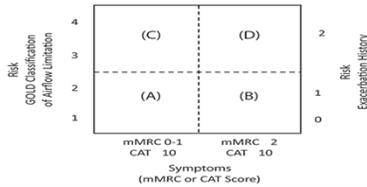
Assess Comorbidities

- CV disease
- Metabolic syndrome
- Osteoporosis
- Depression
- Lung cancer

Don't forget to treat these too!!

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Combined Assessment of COPD



Patient Category	Characteristics	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

CAT, COPD Assessment Test; COPD, chronic obstructive pulmonary disease; GOLD, Global Initiative for Chronic Obstructive Lung Disease; mMRC, Modified British Medical Research Council

Goals of COPD Management

- Reduce symptoms
 - Improve health status
 - Improve exercise tolerance
 - Relieve symptoms
- Reduce risk
 - Prevent progression
 - Prevent exacerbations
 - Treat exacerbations
 - Reduce mortality

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Therapeutic Options

- Smoking cessation: any and all options
- Smoking prevention: political solutions
- Reduce occupational exposures
- Reduce indoor/outdoor air pollution
- Increase physical activity
- Influenza and pneumococcal vaccination

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Vaccines and COPD

- PPSV23 and PCV13 recommended
 - Reduces pneumonia in moderate/severe COPD (age<65)
 - Do not reduce mortality
- Influenza vaccine
 - Reduces influenza rate (28.1 vs. 6.8 per 100 person-yrs)
 - Reduces influenza related mortality
 - Reduces COPD exacerbation frequency (WMD: -.37)

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Treatment of Stable COPD

- Oxygen:
 - Long-term O₂ (>15 hrs/day) increases survival
 - PaO₂ ≤ 55mmHg or SaO₂ ≤ 88% ± hypercapnia twice over a three week period
 - PaO₂ ≤ 55mmHg or SaO₂ ≤ 88%, with pulmonary HTN, peripheral edema suggestive of CHF, or polycythemia
- Rehabilitation:
 - Reduces dyspnea, fatigue, improves function
 - Benefits shown at all stages of COPD; wanes over time
 - Must be at least 6 wks long followed by home exercises

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Treatment of Stable COPD

- Non-invasive ventilation:
 - Improves survival in stable GOLD 4 only
 - Cochrane review found no benefit of nocturnal use
- Surgical treatments:
 - Limited data on optimal technique and outcomes
- Lung transplant:
 - Limited donor organs/high cost
- Palliative care/hospice:
 - Important, but **underutilized**

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AES Poll Question #4

Which medications are recommended 1st line for a COPD Grade B patient?

- A. SAMA alone
- B. SABA alone
- C. LABA + ICS
- D. LABA alone

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Pharmacologic Treatment of Stable COPD

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Bronchodilators

- First line treatment; LOTS of choices!
- **SABAs** or **SAMAs** for symptomatic relief only
 - Albuterol, levalbuterol, ipratropium
- **LABAs**, **LAMAs** or **both** for symptom prevention
- LABAs:
 - Salmeterol, vilanterol, olodaterol, indacaterol, aformoterol, formoterol
- LAMAs:
 - Tiotropium, umeclidinium, aclidinium

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Corticosteroids

- ICS improve symptoms, decrease exacerbations, but increase pneumonia
- For severe/very severe COPD, exacerbations not controlled by bronchodilators alone
- ICS monotherapy: not recommended
 - Budesonide, fluticasone, beclomethasone,
- LABA/ICS: more effective than either alone
 - Salmeterol/fluticasone, formoterol/budesonide, formoterol/mometasone, vilanterol/fluticasone
- Oral steroids: not recommended
 - Prednisone, methylprednisolone

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Others

- Phosphodiesterase-4 inhibitors:
 - Reduce exacerbations in GOLD 3 or 4
 - Overall weak evidence, expensive, side effects
 - Roflumilast, Cilomilast
- Methylxanthines:
 - Not recommended due to side effect profile
 - Theophylline, aminophylline

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Patient	Recommended First Choice	Alternative Choice	Other Possible Treatments
A	SAMA prn or SABA prn	LAMA or LABA or SABA and SAMA	Theophylline
B	LAMA or LABA	LAMA and LABA	SABA and/or SAMA Theophylline
C	ICS + LABA or LAMA	LAMA and LABA or LAMA and PDE4-inh. or LABA and PDE4-inh.	SABA and/or SAMA Theophylline
D	ICS + LABA and/or LAMA	ICS + LABA and LAMA or ICS+LABA and PDE4-inh. or LAMA and LABA or LAMA and PDE4-inh.	Carbocysteine SABA and/or SAMA Theophylline

AES Poll Question #5

What is the recommended steroid dosing regimen for acute exacerbations?

- Solmedrol 125mg IV q6hrs
- Prednisone 40 mg PO X 5 days
- Prednisone 20 mg x 14 days
- Solmedrol initially until discharge then oral Prednisone

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Management of COPD Exacerbations

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Management of Exacerbations

- “Acute event characterized by a **worsening** of the patient’s **respiratory** symptoms that is **beyond** normal day-to-day variations and leads to a **change** in medication”
- Work-up:
 - ABG/VBG (if ER/hospital setting)
 - Chest X-ray
 - EKG
 - CBC
 - Chemistry

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AES Poll Question #6

Which of the following is NOT a recommended 1st line antibiotic for a COPD exacerbation?

- Levofloxacin
- Nitrofurantoin
- TMP-SMX
- Azithromycin
- Doxycycline
- Amoxicillin

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Management of Exacerbations

- Oxygen: titrate to SpO₂ 88-92%
- Bronchodilators: short acting beta-agonists with or without short acting anticholinergics
- Steroids: 40mg prednisone daily x 5 days
- Antibiotics: many options; give if:
 - 2/3 cardinal symptoms: inc dyspnea, inc sputum volume, inc sputum purulence
 - Inc sputum purulence and one other symptom
 - Patient requires mechanical ventilation

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CRP and Antibiotics in AECOPD

- Spanish GP's assigned to education, education + CRP or control
- 952 patients with AECOPD, 339 providers
- Prescribed antibiotics if CRP >100 mg/L withheld if < 20 mg/L
- CRP testing reduced inappropriate antibiotic prescribing
 - 72% to 45%; OR = 0.35; 95% CI 0.18 - 0.68
- Education and feedback no effect
- Limitations: only study, nonrandomized, patient outcomes not evaluated

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Management of Exacerbations

- Non-invasive ventilation (NIV) :
 - Use when standard therapies fail
 - Improves respiratory acidosis
 - Decreases respiratory rate and dyspnea
 - Decreases complications, length of stay, costs
 - Decreases mortality and need for intubation

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Indications for Admission

- Marked increase in intensity of symptoms
- Severe underlying COPD
- Onset of new physical signs
- Failure to respond to initial management
- Presence of serious comorbidities
- Frequent exacerbations
- Older age
- Insufficient home support

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Indications for ICU Admission

- Severe dyspnea not responding to initial therapy
- Mental status changes
- Severe hypoxemia (PaO₂ < 40 mmHg) and/or acidosis (pH <7.25) despite O₂/NIV
- Intubation
- Pressors

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COPD Exacerbation Prognosis

- Dyspnea, Eosinopenia, Consolidation, Acidemia, and Atrial Fibrillation (DECAF) score
- Derivation = 880 patients; validation = 845 patients
- Divided into low (0 or 1 pts), moderate (2 pts), or high risk (3 +pts)
- Within group mortality: 1.0%, 5.4%, and 21.4% respectively
- Area under the receiver operating characteristic curve: 0.82
- DECAF: helps identify patients safe for discharge vs closer monitoring vs ICU

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Latest Evidence on COPD

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Deep Breath! These Help:

- Long acting bronchodilators (LABAs) reduce COPD exacerbations and hospitalizations
- Long acting anticholinergics reduce COPD exacerbations and hospitalizations
- Inhaled corticosteroids (ICS) can be withdrawn w/o increasing exacerbations but lung function decreases
- Oral N-acetylcysteine reduces exacerbations
- Integrated care programs reduce readmissions

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Deep Breath: These Don't!

- Daily azithromycin, vitamin D, simvastatin do NOT reduce COPD exacerbations!
- Sildenafil doesn't improve pulmonary rehab
- Long-term non-invasive ventilation (NIV) doesn't improve outcomes in stable COPD
- Integrated care programs don't work
- Air pollution causes exacerbations, inc mortality
- Lung reduction procedures still experimental

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Billing and Coding

- J44.-Other chronic obstructive pulmonary disease
- Includes:
 - Asthma with chronic obstructive pulmonary disease
 - Chronic asthmatic (obstructive) bronchitis
 - Chronic bronchitis with airways obstruction
 - Chronic bronchitis with emphysema
 - Chronic emphysematous bronchitis
 - Chronic obstructive asthma
 - Chronic obstructive bronchitis
 - Chronic obstructive tracheobronchitis
- Excludes:
 - Bronchiectasis (J47.-)
 - Chronic bronchitis NOS (J42)
 - Chronic simple and mucopurulent bronchitis (J41.-)
 - Chronic tracheitis (J42)
 - Chronic tracheobronchitis (J42)
 - Emphysema without chronic bronchitis (J43.-)
 - Lung diseases due to external agents (J60-J70)

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Billing and Coding

- J44.0 Chronic obstructive pulmonary disease with acute lower respiratory infection
- J44.1 Chronic obstructive pulmonary disease with (acute) exacerbation
 - Decompensated COPD
 - Decompensated COPD with (acute) exacerbation
- J44.9 Chronic obstructive pulmonary disease, unspecified
 - Chronic obstructive airway disease NOS
- 99406-99407 Smoking and tobacco use cessation counseling (3-10 minutes, >10 minutes)
- G0436-G0437 Smoking and tobacco use cessation counseling, asymptomatic patient (3-10 minutes, >10 minutes)
- 94010 Spirometry
- 94060 Pulmonary function testing, pre- and post-
- 94729 DLCO
- 94664 Demonstration of aerosol generator...
- 94760 Pulse oximetry; single determination
- 94761 Multiple determinations (i.e., six-min walk)
- 94640 Nebulizer treatment

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And Yes, There Are Apps!



iOS app: \$5.99
(no Android version)



iOS app: Free
(no Android version)

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Learning Objectives

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Practice Recommendations

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Questions?

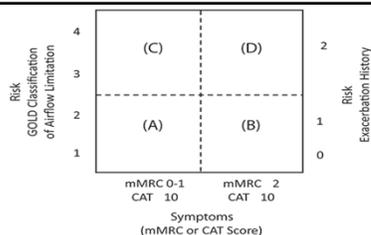
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Contact Informaton

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Billing & Coding

When services performed in conjunction with:

Office Visit 992xx

99406-99407 Smoking and tobacco use cessation counseling (3-10 minutes, >10 minutes)

G0436-G0437 Smoking and tobacco use cessation counseling, asymptomatic patient (3-10 minutes, >10 minutes) Medicare use codes

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Billing & Coding (Continued)

Additional tests to confirm or monitor:

94010 Spirometry
94060 Pulmonary function testing, pre- and post-
+94729 DLCO
94664 Demonstration of aerosol generator, nebulizer, metered dose inhaler,
or IPPB device
94760 Pulse oximetry;single determination
94761 ;multiple determinations (i.e., six-minute walk)
94640 Nebulizer treatment

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Associated Session

- Chronic Obstructive Pulmonary Disorder (COPD): PBL

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Interested in More CME on this topic?
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