“Breathe Again”
2019 Update on AECOPD

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Disclosures

None
Objectives

• Accurately diagnose acute exacerbations of COPD

• Describe evidence based management of acute exacerbations of COPD

• Outline how care should be transitioned to the ambulatory setting from the hospital
You Take My Breath Away

Burden of COPD

1. Prevalence 13 million
2. ED visits 1.5 million
3. Hospitalizations 715,000
4. Deaths 135,000
5. Cost $50 billion

CHEST April 2015; 147 (4):883-893
**CC:** Dyspnea, Wheezing, Cough x 4d

67 y/o man with COPD, dyslipidemia and HTN is in the ED with worsening dyspnea, increased productive cough with sputum color change from clear tan to greenish color and wheezing. He stated he was dyspneic on exertion but denied fevers, palpitations, chest pain or night sweats.
Social History
40 pack year smoking history but denied using alcohol or illicit drugs.

Medications
Lisinopril
Atorvastatin
Tiotropium
Levalbuterol inhaled
Ipratropium/albuterol
Fluticasone/salmeterol
BP 110/60 mm Hg, HR 110/min, T 98.7F, RR 34/min, SpO2 is 81% on room air

Thin man who appeared awake and alert. He was in moderate respiratory distress and using his accessory muscles.

CARDIAC-S1/S2, tachycardia, S3 gallop
LUNGS-Coarse rhonchi & diffuse wheezing
No cyanosis or lower extremity edema
The rest of the exam was unremarkable
**Labs**
pH 7.20, pCO2 67, pO2 61 HCO3 30
WBC: 14,000 cells/uL, H/H 15/48, Plts 150K

**Imaging**
Sinus tach (115/min), no ST/T wave changes
CXR: Lungs hyperinflated with flattened Diaphragms. No acute infiltrates were seen

**PFT**: FEV1 1.56 L (30% predicted)
          FVC 2.28 L (40% predicted)
          FEV1/FVC 0.68
Was the diagnosis accurate?

- **Yes.** COPD = **S**xs + **S**moking + **S**pirometry
  - **C**ough, **D**yspnea, **S**putum production
  - Beyond the normal day to day variation
  - Usually requires a change in treatment
- Smoking hx, multiple COPD admissions, worsening resp sxss → AECOPD
- Acute Resp Failure d/t resp sxss (difficulty breathing + hypoxemia and hypercapnea)
Fighting For Air

• Consider the diagnosis if age > 40 yrs
  • Cough, Dyspnea, Chronic sputum
  • Smoking or other risk factors
  • Post BD FEV1/FVC < 0.7

• Diagnosis of COPD requires 3 S’s
  • Symptoms
  • Smoking
  • Spirometry
THE GOLD Refined ABCD ASSESSMENT TOOL

Diagnosis = Assessment of airflow limitation + Assessment of symptoms/risk of exacerbations

FEV1/FVC<0.7

<table>
<thead>
<tr>
<th>Grade</th>
<th>FEV1 (%) pred.</th>
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<tbody>
<tr>
<td>1</td>
<td>≥80</td>
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<tr>
<td>2</td>
<td>50-79</td>
</tr>
<tr>
<td>3</td>
<td>30-49</td>
</tr>
<tr>
<td>4</td>
<td>&lt;30</td>
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Exacerbation History

C

≥ 2 or ≥1 leading to hospitalization

D

0 or 1 (not leading to hospital admission)

A

mMRC 0-1
CAT < 10
CCQ < 1

B

mMRC 2+
CAT 10+
CCQ 1+
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 well being and daily life. Your answers, and test score, can be used by you or 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 1 2 3 4 5 I am very sad

Score

Your name: ____________________________
Today’s date: ________________________

mMRC Score

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 only 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

Total score
ACO

**Asthma COPD Overlap**

- Significant overlap btn asthma & COPD
- Onset > 40 yrs with a FH asthma
- Past or current smoking history
- Atopy, Rhinitis, GERD history
- Freq & severe exacerbations
- Hyperresponsive ax (AHR)
- %FEV1<0.7+BD response
Acute Exacerbation

• **Definition**
  Acute event characterized by worsening respiratory symptoms that is beyond the normal day to day variations & leads to a change in medications

• **Triggers of COPD exacerbation**
  • Resp infxns, Air pollution, Comorbid dx
Exacerbations

• **Mild**
  Increase in quick relief bronchodilator

• **Moderate**
  Requires antibiotics &/or corticosteroids

• **Severe**
  $\geq 2$ exacerbations/yr or $\geq 1$ hospitalization
One Last Breath

- Severity of COPD (FEV1 30/50/80 rule)
- Prior intubations, ICU or hospital stay
- Chronic steroid use or O2 therapy
- Comorbidities (CAD, DM, HTN)
- Exacerbation frequency
Lose My Breath

- CXR
- ABG
- EKG
- CBC
- BMP
- Sputum gram stain & culture
  - If pt has failed home antibiotics
  - Severe airflow limitation
  - Pt is on a ventilator
Clinical course
Admitted to the wards with the diagnosis of COPD exacerbation and treated with oxygen 6L/min (N/C). He also got inhaled albuterol nebs 2.5mg every 2 hr and PO prednisone 60mg/d.

He deteriorated on D-2 with severe hypoxemia & increasing resp. mm fatigue leading to intubation, mech. ventilation and was transferred to the ICU.

He got IV steroids, albuterol/ipratropium nebs & IV antibiotics. He was weaned & extubated on D-8 & discharged home on a prednisone taper on D-10.
Was he managed effectively?

- **No.** Due to resp failure ? need for NIV & abx
  RR 34, SpO2 81% (RA) pH 7.20 pCO2 67

- Antibiotics should be given in AECOPD if
  - Worsening dyspnea
  - Purulent sputum production
  - Increased sputum production

- **Indications for Non Invasive Ventilation**
  - RR > **25/min**, pH < 7.35, pCO2 > **45**
  - Persistent resp acidosis after 1 hr of max medical rx
ICU Admission

• Severe dyspnea unresponsive to the initial rx
• Persistent hypoxemia (pO2< 40 on O2 rx)
• Severe resp acidosis (pH < 7.25 on NIV)
• Presence of other end organ failure
• Hemodynamic instability
• Mental status changes
Hospitalization

- High risk comorbidities
- Altered mental status
- Respiratory distress
- Unclear diagnosis
- Failed outpt mx
- Hypercapnea
- Hypoxemia
Hospitalization

BAP-65 score

BAP score 0-1 → Medical ward

BAP score ≥2 → ICU admission
BAP-65 Score

BAP-65 score for COPD risk

**Mechanical Ventilation**

- No risks: 0%
- Age only: 0%
- Two risks: 5%
- Three risks: 40%
- Four risks: 60%

**Mortality**

- No risks: 0%
- Age only: 0%
- Two risks: 10%
- Three risks: 20%
- Four risks: 30%

B – BUN >25  A – AMS  P – Pulse >109  >65 year old

Non Invasive Ventilation

INDICATIONS
» Exacerbation of COPD
» Cardiogenic pulm edema
» PNA in immunocomp. pts
» Post extubation resp failure
Avoid Complications

» Feeding
» Analgesia
» Sedation
» Thromboprophylaxis

» HOB > 30°
» Ulcer prophylaxis
» Glucose control
» SBT

» Bowel regimen
» Indwelling catheters
» De-escalation of abx
Take My Breath Away

Antibiotics

Severe exacerbation (FEV1 < 35%, MV, > 65yr, >3E’s/yr)

- Ceftriaxone 1 – 2g or Levofloxacin 750mg q 24hr IV
- Piperacillin/Tazobactam 4.5g every Q 6hr IV
- Cefepime 1 – 2g every 8 – 12 hr IV
- Aztreonam 2g every 8 hrs IV

Moderate exacerbations (FEV1 35-50% + above criteria)

- Amoxicillin-clavulanate 875/125 mg BID PO
- Doxicycline 100 mg BID PO
- Azithromycin 500 mg daily
- Moxifloxacin 400 mg daily
Every Breath You Take

• **Bronchodilators**
  1. Albuterol 2.5mg/3ml (0.083%) neb q 4hr
  2. Ipratropium 0.5mg/2.5ml (0.02%) neb q 6hr
  3. Albuterol + Ipratropium (2.5mg + 0.5mg) 3ml q 6hr

• **Corticosteroids**
  1. Methylprednisone 40mg IV daily or until they can take PO
  2. Prednisone 40mg daily PO x 5 - 7 day

• **Devices**
  1. Oxygen --- L/min via nasal cannula to keep SpO2 86-92%
  2. NIV if RR >25 & < 35, pH < 7.35 & > 7.25, p CO2 > 45 & < 60
Was his discharge appropriate?

- **No.** Our pt fits the criteria for stage D GOLD. He should be on the following medications
  - Short and long acting bronchodilators
  - Inhaled corticosteroid
  - ? Oxygen therapy
- He shd have been assessed for home O2
  - PaO2 < 55 mm Hg or SpO2 < 88% at rest
  - PaO2 56 – 59 mm Hg with Polycythemia, Pulmonale or Pedal edema
Indications for discharge

- Dyspnea symptoms return to baseline
- Oxygenation returns to baseline
- Tolerating oral meds and intake
- Inhalers no more than q 4hrs
- Hemodynamic stability
- Ambulating
Pharmacologic Treatment Algorithms by GOLD Grade

Exacerbation History

≥ 2
Or
≥ 1 Leading to Hospital admission

Group C

LAMA + LABA

LABA + ICS

Further Exacerbation(s)

LAMA

Group D

Consider Roflumilast if FEV₁ < 50% pred. and patient has chronic bronchitis

Consider Macrolide in former smokers

Further Exacerbation(s)

LAMA + LABA + ICS

Persistent Symptoms / Further Exacerbation(s)

LAMA

LAMA + LABA

LAMA + ICS

Group A

Continue, stop or try alternative class of bronchodilator

Evaluate effect

A Bronchodilator

Group B

LAMA + LABA

Persistent symptoms

A Long-Acting Bronchodilator LABA or LAMA

mMRC 0 – 1
CAT < 10

mMRC ≥ 2
CAT ≥ 10

SYMPTOMS

In patients with a major discrepancy between the perceived level of symptoms and severity of airflow limitation, further evaluation is warranted.
Summary – This care bundle is a group of evidence based items that should be delivered to all patients being discharged from the hospital following an Acute Exacerbation of Chronic Obstructive Pulmonary Disease (AECOPD). The care bundle aims to improve quality of care, patient experience and minimise the risk of re-hospitalisation. To ensure the bundle can apply to all we have prepared a combination of actions and documents to facilitate the discharge process.

Inform the COPD CNS of all COPD patients within **24 hours of arrival** including patients discharged. Extension 55362 or 58472.

**CARE BUNDLE STEPS**
All required documents are included in package.

1. **If patient is a smoker offer smoking cessation assistance**
   For community referral Fax 020 8962 4135
   For C&W clinic referral Fax 020 8746 5684
   Completed Declined N/A Not Done

2. **Pulmonary rehabilitation - assessed for suitability**
   First point of contact, either by the CNS Nurses or Physiotherapist, who
   will assess and refer patient. Nurse to contact if not done prior to
   discharge (fax referral form)
   Completed Declined N/A Not Done

3. **Written COPD patient information given including:**
   • British Lung Foundation Self Management Book
   • Oxygen alert WALLET card
   • Information about the Breathe Easy Group
   Completed Not Done

4. **Satisfactory use of inhalers demonstrated and understood**
   Please assess during medication rounds. Observe the patients using the
device(s) and document on electronic prescribing record adequate technique
demonstrated. (Refer to pharmacist or CNS if extra support is needed).
   Completed Not Done

5. **Follow up arrangements after discharge.**
   An out-patient appointment within 30 days of
   discharge should be arranged via ward clerk and patient informed.
   Completed Not Done

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The discharging nurse checks that all steps in the care bundle are completed

Nurse (Initials) __________

Date of discharge __/__/____

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Place the faxed referral form(s) in the plastic sleeve during the patients stay, at discharge place with the COPD Discharge Checklist in the ‘Completed’ COPD Care Bundle Box located;
AMU /David Erskine: Nurses Station (Maroon coloured boxes)

Care bundle components are based on:
NICE COPD guidelines 2004 (1-5)
A Patient Experience Survey CLAHRC team April 2009 [6]
Systematic Literature Review supported by CLAHRC April 2009 [1-6]
Transitions of Care

- Guideline directed rx protocols for pts
  - ED visits and hospitalized patients
- Patient and caregiver education on
  - Smoking cessation, Inhaler use, Action plan
- Patient assessment of
  - Comorbidities, O2 needs, Goals of care, Spirometry
- Follow up plan
  - Follow-up plan (Provider 7-10d, Phone call 48-72hr)
  - Community Home Services and Pulmonary Rehab
Breathe In and Out

1. Remove the mouthpiece cover and check the mouthpiece inside and outside to see that it is clean and free of objects. It is important to breathe as slowly as possible before using your inhaler.

2. Shake the inhaler 4 or 5 times to ensure that any loose objects are removed and that the contents of the inhaler are evenly mixed.

3. Hold the inhaler upright with your thumb on the base, below the mouthpiece. Breathe out as far as is comfortable.

4. Place the mouthpiece in your mouth between your teeth and close your lips firmly around it, do not bite.

5. Breathe in through your mouth. Just after starting to breathe in, press firmly down on the top of the canister to release a puff of medicine. Do this while still breathing in steadily and deeply.

6. Hold your breath, take the inhaler from your mouth and your finger from the top of the inhaler. Continue holding your breath a few seconds, or as long as is comfortable.

If you are to take a second puff keep the inhaler upright and wait about half a minute before repeating steps 2 to 6.

Afterwards, rinse your mouth with water and spit it out. This may help to stop you getting thrush and being hoarse.

After use always replace the mouthpiece cover to keep out dust. When the mouthpiece cover is fitted correctly it will ‘click’ into position. If it does not ‘click’ into place, turn the mouthpiece cover the other way round and try again. Do not use too much force.
Post Discharge Care

• Manage comorbid diseases
  • Median number of comorbidities is 9
  • Majority of 30d readmissions is not d/t COPD

• Transitional care CPT codes for billing
  • Includes office and certain non face to face contact
  • Codes are 99495 and 99496 billable by the 1st MD

• Telehealth/DME Programs/Home Health
  • What to monitor, who reviews data, what action to take
  • Org work with hospitals using common approaches
**MY COPD ACTION PLAN**

*Actions to take if my symptoms get worse*

Bring this plan with you every time you visit your doctor

### General Information
- **Name:**
- **Date of Birth:**
- **Emergency Contact:**
- **Phone Number:**
- **Physician/Healthcare Provider Name:**
- **Phone Number:**
- **Physician Signature:**
- **Date:**

### Inhaled Daily Medicines

<table>
<thead>
<tr>
<th>Name of Medicine</th>
<th>How Much to Take</th>
<th>When to Take It</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quick Relief</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Long-Acting</strong></td>
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<td></td>
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<tr>
<td><strong>Inhaled Steroid</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Combination</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Nebulizer</strong></td>
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### Green Zone: I am doing well today

- Usual activity and exercise level
- Usual amounts of cough and phlegm/mucus
- Sleep well at night
- Appetite is good

### Actions
- 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

- More breathless than usual
- I have less energy for my daily activities
- Increased or thicker phlegm/mucus
- Change in color of 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

### Actions
- Continue daily medications
- Use quick relief inhaler every ____ hours
- Start Prednisone: __________________
- Start Antibiotic: __________________
- Use oxygen as prescribed
- Get plenty of rest
- Use pursed lip breathing
- At all times avoid cigarette smoke, inhaled irritants
- Call provider if symptoms don’t improve

### Red Zone: I need urgent medical care

- 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 pain
- Coughing up blood

### Actions
- Call 911 or have someone take you to emergency room
- Increase oxygen to: __________________
- Take Prednisone: __________________

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For more information visit www.lungusa.org or call 1-800-LUNGUSA (586-4872)

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With Every Breath I Take

• Recognize acute exacerbations
  • Acute, worsening resp sx → medication change
  • Pulm infxns, Pollutants, Comorbid dx, h/o AECOPD

• Management of AECOPD pts
  • Antibiotics, BD, CS, Devices
  • SC, Immunizations, Pulm rehab, Oxygen therapy

• Transitions of Care
  • Address checklist and comorbid dxs
  • Follow-up visit, Education, Guideline directed rx