Chronic Obstructive Pulmonary Disease

CareOregon Pharmacy

Abridged sample of presentation content
Sample of physician’s slides

- Home Equipment
- Pathophysiology
- Guidelines
- Exacerbations
- Lifestyle Modification
- Medication Management
BREATHTAKING NUMBERS

Smoking is the primary cause of COPD

$49.9 BILLION
Annual economic cost of COPD (ER visits, hospitalizations and lost productivity)

13.1 MILLION
U.S. adults have diagnosed COPD

12.0 MILLION
U.S. adults have undiagnosed COPD

Among those living with COPD

51% say it limits their ability to work

53% say it limits their social activities

Source: www.hopkinsmedicine.org
What is COPD?

**Chronic Obstructive Pulmonary Disease**

– Preventable and treatable disease

• characterized by persistent airflow limitation (narrowing of the small airways)

• progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases

*Global Strategy for the Diagnosis, Management and Prevention of COPD,*
What will a COPD patient feel like?

- Shortness of breath, especially during physical activities
- Wheezing
- Chest tightness
- A chronic, productive cough, typically in the morning - produces sputum that may be clear, white, yellow or greenish
- Blueness of the lips or fingernail beds (cyanosis)
- Frequent respiratory infections
- Lack of energy
- Unintended weight loss (in later stages)
What causes COPD?

• Tobacco smoking.
  – About 20% of chronic smokers will develop COPD.
  – The more years you smoke and the more packs you smoke, the greater your risk.

• Genetic susceptibility to the disease - Alpha-1-antitrypsin deficiency
  – only about 1% of all COPD
Chronic inflammation results in structural changes that narrow the small airways

- Walls of the airways become inflamed, swell, and clog with mucus.
- This partly or completely blocks the airway, making it hard to move air in and out of the lungs.

## COPD vs. Asthma

<table>
<thead>
<tr>
<th></th>
<th>COPD</th>
<th>Asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age on onset</strong></td>
<td>Typically age &gt; 40</td>
<td>Typically in childhood</td>
</tr>
<tr>
<td><strong>Smoking history</strong></td>
<td>Usually</td>
<td>Not causal</td>
</tr>
<tr>
<td><strong>Family history</strong></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Clinical symptoms</strong></td>
<td>Persistent and progressive</td>
<td>Intermittent and variable</td>
</tr>
<tr>
<td><strong>Cough</strong></td>
<td>Usually productive cough in the morning</td>
<td>Usually dry cough at night</td>
</tr>
<tr>
<td><strong>Sputum production</strong></td>
<td>Frequently in the morning</td>
<td>Infrequent unless poorly controlled</td>
</tr>
<tr>
<td><strong>Reversibility of airflow obstruction</strong></td>
<td>No- not fully reversible after short-acting bronchodilator</td>
<td>Yes- mostly reversible after short-acting bronchodilator</td>
</tr>
<tr>
<td><strong>Exacerbations</strong></td>
<td>Frequency increases with disease severity</td>
<td>Common at all levels</td>
</tr>
<tr>
<td><strong>Inflammation Process</strong></td>
<td>Neutrophil and no mast cell activation</td>
<td>Eosinophil and mast cell activation</td>
</tr>
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</table>
Epidemiology of COPD

• 3rd leading cause of death in the US
• One death every 4 minutes
• 12 million people are diagnosed with COPD
  – Under-recognized and under-diagnosed
  – An additional 12 million have undiagnosed COPD

## COPD Severity in patients with FEV$_1$/FVC < 0.70

<table>
<thead>
<tr>
<th>GOLD staging</th>
<th>Severity</th>
<th>FEV$_1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD 1</td>
<td>Mild</td>
<td>FEV$_1$ $\geq$ 80% predicted</td>
</tr>
<tr>
<td>GOLD 2</td>
<td>Moderate</td>
<td>50% $\leq$ FEV$_1$ &lt; 80% predicted</td>
</tr>
<tr>
<td>GOLD 3</td>
<td>Severe</td>
<td>30% $\leq$ FEV$_1$ &lt; 50% predicted</td>
</tr>
<tr>
<td>GOLD 4</td>
<td>Very Severe</td>
<td>FEV$_1$ &lt; 30% predicted</td>
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### Need Spirometry: based on post-bronchodilator FEV$_1$

# Patient Classification

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<th>Patient Group</th>
<th>Characteristic</th>
<th>COPD Severity</th>
<th>Exacerbations per year</th>
<th>CAT</th>
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<td>GOLD 1-2</td>
<td>≤ 1</td>
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Symptom Classification:
- CAT: COPD Assessment Test
- mMRC: The Modified British Medical Research Council scale - only looks at breathlessness - **CAT is preferred**
# Low Risk

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**Low risk:** ≤1 per year exacerbations and no hospitalization for exacerbation

# High Risk

## Patient Group | Characteristic | COPD Severity | Exacerbations per year | CAT | mMRC
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**High risk:** ≥ 2 exacerbations per year or ≥ 1 with hospitalization

COPD complications

• **Exacerbations**: acute event with worsening respiratory symptoms and leads to change in medication
  – Poor prognosis and increased risk of death
  • Associated with rapid decline of lung function
  • Decreased quality of life
  – In-hospital mortality rate of 2-5%
  – 30-day mortality rate of 3-9%
  – 90-day mortality rate of >15%

Sample of pharmacist’s slides
Treatment options

• **Bronchodilators**
  - Relax airway smooth muscle and improve lung emptying
    - $\text{B}_2$-Agonists
      - Short-acting
      - Long-acting
    - **Anticholinergics**
      - Short-acting
      - Long-acting
    - **Methylxanthines**

• **Corticosteroids**
  - Inhaled
  - Systemic

• **Combination products**
  - $\text{B}_2$-Agonists/anticholinergic
  - $\text{B}_2$-Agonists/corticosteroids
# Short acting $\beta_2$-Agonists

“Rescue Medication”

<table>
<thead>
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<th>Medication</th>
<th>Typical Dosing</th>
<th>Delivery device</th>
<th>Side effects</th>
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<tbody>
<tr>
<td>Albuterol (ProAir, ProAir Respiclick, Ventolin, Proventil)</td>
<td>2 puffs every 4-6 hrs as needed</td>
<td>Aerosol inhaler, Dry powder nebulizer</td>
<td>tremors, resting sinus tachycardia, palpitations, insomnia</td>
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<tr>
<td>Levalbuterol (Xopenex)</td>
<td>2 puffs every 4-6 hrs as needed</td>
<td>Aerosol inhaler nebulizer</td>
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## Long acting $\beta_2$-Agonists (LABA)

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<tr>
<td>Formoterol (Foradil)</td>
<td>1 inhalation (12 mcg) twice daily</td>
<td>Aerolizer inhaler</td>
<td>tremors, palpitations, insomnia, dry mouth, headache</td>
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<tr>
<td>Salmeterol (Serevent)</td>
<td>1 inhalation (50 mcg) twice daily</td>
<td>Dry powder inhaler</td>
<td></td>
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<tr>
<td>Olodaterol (Striverdi Respimat)</td>
<td>2 inhalations once daily</td>
<td>Soft-mist inhaler</td>
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<tr>
<td>Arformoterol (Brovana)</td>
<td>12 mcg twice daily</td>
<td>Nebulizer</td>
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<tr>
<td>Indacaterol (Arcapta)</td>
<td>75 mcg daily</td>
<td>Capsule for inhalation</td>
<td></td>
</tr>
<tr>
<td>Vilanterol</td>
<td>Not available as single product- combination product with fluticasone and umeclidinium</td>
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Inhaled corticosteroids (ICS)

Place in therapy: repeated exacerbations

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Clinical benefits:

- improves symptoms, lung function, and quality of life, and reduces the frequency of exacerbations in COPD patients with an FEV1 < 60% predicted
- does not modify the long-term decline of FEV1 nor mortality in patients with COPD
Phosphodiesterase inhibitor

- Roflumilast (Daliresp)
- Relaxes airway smooth muscle cells and decreases activity of inflammatory cells and mediators (TNF-α and IL-8)
  - For severe COPD to reduce exacerbations
  - Should be used with at least one long-acting bronchodilator
  - Conflicting studies
Oral corticosteroid

Prednisone 40 mg a day for 5 days

- Shortens recovery time, length of hospital stay, improves FEV$_1$ for exacerbations
- Adverse effects: increases appetite, moodiness, increases in blood sugars
- Patient can be reminded to take in the morning
- Taper not needed
Health Maintenance

• Vaccinations
  – Yearly influenza
  – Pneumococcal

• Smoking Cessation
  – Greatest capacity to influence the natural history of COPD
  – All patients should be encouraged to quit

Global Strategy for the Diagnosis, Management and Prevention of COPD, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2015.
Quitting is Hard

50% of people who recover from lung cancer surgery start smoking again afterwards.

Source: FDA

The average person attempts to quit eight to eleven times before succeeding.

Resources To Help You Quit

CareOregon covers several medications to help people quit smoking, as well as enrollment in the Quit For Life program.

Call toll-free any day from 5 a.m. to 9 p.m.
866-784-8454
Reasons to Quit

• My risk of cancer, heart attacks, chronic lung disease, stroke, cataracts, and other diseases will drop.
• My blood pressure will go down.
• I’ll look better. My skin will be more hydrated and less wrinkled, my teeth will look less yellow and my fingers won’t be stained with nicotine.
• I’ll save money.
• My hair, clothes, car, and home won’t reek of smoke.
• I’ll have more energy.
• I’ll set a better example for my kids, friends, and family.
• I’ll live longer.
Traditional Counseling

• Advice given, patient expected to listen, follow instructions.
• Can increase resistance to change.
• Makes patient defensive.

Motivational Interviewing

• Patient does most of the talking.
• Help patient understand their own motivation for change.
• Patient is the expert on their personal circumstances.
What is an “exacerbation” and what are the typical causes?

• An exacerbation is a worsening of the patients cough, shortness of breath, or sputum that is beyond the normal day to day variations.

• The main cause of an exacerbation is usually a viral or bacterial infection.

• Smoking, improper use of an inhaler, and poor adherence to drug therapy are also commonly seen as causes.

Think about the possibility of an empty inhaler
Empty Inhaler Usage

• The method of floating an inhaler is no longer the correct way to tell if its empty. The change in propellant has made it impossible to tell by floating or shaking to feel for contents.

• The only way to tell is by using a counter or manually recording puffs taken.

• This change has led to an increase in the accidental use of empty inhalers.
Red Flags

• **Unusual sleepiness or confusion** – sleeping more during the day can be a big indicator of a problem.

• **Headaches/blurry vision** – An increase in the PaCO2 and low oxygen can both cause these symptoms.

• **Frequent nebulizer or inhaler use** with no/minimal relief from severe shortness of breath

• **Gray or blue skin tone** – most often seen in the nail beds and lips.
How Can a History of Trauma Impact COPD Patients?

• Claustrophobia (oxygen and CPAP/BIPAP masks)
• Anxiety (abnormally high with attacks/exacerbations)
• Difficulty with self calming techniques
• Substance abuse (may impact ability to follow through with meds/therapy)
Everyone should use a spacer!

Without a spacer more than **80%** of the medication deposits in the mouth and throat *without ever reaching the lungs.*
Thank you!