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

Staging

• Assess symptoms
• Assess degree of airflow limitation using spirometry
• Assess risk of exacerbations
ASSESS SYMPTOMS
<table>
<thead>
<tr>
<th>mMRC Grade 0. I only get breathless with strenuous exercise.</th>
<th>☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>mMRC Grade 1. I get short of breath when hurrying on the level or walking up a slight hill.</td>
<td>☐</td>
</tr>
<tr>
<td>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.</td>
<td>☐</td>
</tr>
<tr>
<td>mMRC Grade 3. I stop for breath after walking about 100 meters or after a few minutes on the level.</td>
<td>☐</td>
</tr>
<tr>
<td>mMRC Grade 4. I am too breathless to leave the house or I am breathless when dressing or undressing.</td>
<td>☐</td>
</tr>
</tbody>
</table>
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

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 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

Click to get your total score!
ASSESS DEGREE OF AIRFLOW
In patients with FEV$_1$/FVC < 0.70:

- **GOLD 1: Mild**  $\text{FEV}_1 \geq 80\%$ predicted
- **GOLD 2: Moderate**  $50\% \leq \text{FEV}_1 < 80\%$ predicted
- **GOLD 3: Severe**  $30\% \leq \text{FEV}_1 < 50\%$ predicted
- **GOLD 4: Very Severe**  $\text{FEV}_1 < 30\%$ predicted

*Based on Post-Bronchodilator*
Assess Exacerbations Risk

• Two exacerbations or more within the last year = high risk
• $\text{FEV}_1 < 50 \%$ of predicted value are indicators of high risk.
### Global Strategy for Diagnosis, Management and Prevention of COPD

#### Combined Assessment of COPD

<table>
<thead>
<tr>
<th>Patient</th>
<th>Characteristic</th>
<th>Spirometric Classification</th>
<th>Exacerbations per year</th>
<th>mMRC</th>
<th>CAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Low Risk Less Symptoms</td>
<td>GOLD 1-2</td>
<td>≤ 1</td>
<td>0-1</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>B</td>
<td>Low Risk More Symptoms</td>
<td>GOLD 1-2</td>
<td>≤ 1</td>
<td>≥ 2</td>
<td>≥ 10</td>
</tr>
<tr>
<td>C</td>
<td>High Risk Less Symptoms</td>
<td>GOLD 3-4</td>
<td>≥ 2</td>
<td>0-1</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>D</td>
<td>High Risk More Symptoms</td>
<td>GOLD 3-4</td>
<td>≥ 2</td>
<td>≥ 2</td>
<td>≥ 10</td>
</tr>
</tbody>
</table>

2013 Global Initiative for Chronic Obstructive Lung Disease
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

- Lung Cancer
- Pulmonary Hypertension
- Anemia
- Cardiovascular Disease
- Peripheral Muscle Wasting & Dysfunction
- Osteoporosis
- Peptic Ulcers
- GI Complications
- Diabetes
- Metabolic Syndrome
- Cachexia

## Pharmacologic Therapy

<table>
<thead>
<tr>
<th>Patient</th>
<th>Recommended First choice</th>
<th>Alternative choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SAMA prn or SABA prn</td>
<td>LAMA or LABA or SABA and SAMA</td>
</tr>
<tr>
<td>B</td>
<td>LAMA or LABA</td>
<td>LAMA and LABA</td>
</tr>
<tr>
<td>C</td>
<td>ICS + LABA or LAMA</td>
<td>LAMA and LABA or LAMA and PDE4-inh. or LABA and PDE4-inh.</td>
</tr>
<tr>
<td>D</td>
<td>ICS + LABA and/or LAMA</td>
<td>ICS + LABA and LAMA or ICS+LABA and PDE4-inh. or LAMA and LABA or LAMA and PDE4-inh.</td>
</tr>
</tbody>
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2013 GOLD
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

- Angicholinergics
  - 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
    • $\text{FEV}_1/\text{FVC}$ 0.65
    • $\text{FEV}_1$ 80%

• Need to stage patient
  • GOLD 1
  • Exacerbations < 1
  • Symptoms – CAT – 9

GOLD A
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
    • $\text{FEV}_1/\text{FVC} \ 0.45$
    • $\text{FEV}_1 \ 45\%$

• Need to stage patient
  • GOLD 3
  • Exacerbations 1 plus FEV1 < 50%
  • Symptoms –mMRC – 3

GOLD D
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 – romflumilast (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