COPD: Guidelines and Devices Update

Amber M. Hutchison, PharmD, BCPS, BCGP
Associate Clinical Professor
Auburn University
Harrison School of Pharmacy
Objectives

- Discuss updated guideline recommendations for treatment of chronic obstructive pulmonary disease (COPD)
- Review available treatment options for COPD including medication classes and medication delivery devices available
- List important patient-specific considerations for medication and medication delivery device selection
- Demonstrate appropriate counseling points for devices used for the treatment of COPD
Disclosures

• Neither I, nor my spouse, have relationships with pharmaceutical companies, biomedical device manufacturers, or other commercial companies whose products or services are related to the subject matter of this presentation.
COPD Definition

• Chronic obstructive pulmonary disease (COPD)
  – Common, preventable, and treatable
  – Characterized by persistent respiratory symptoms and airflow limitation
  – Usually caused by exposure to noxious particles or gas

GOLD Guidelines 2019. www.goldcopd.org
COPD Prevalence

- The direct costs of COPD for the US has been estimated around $30 billion per year
- Worldwide COPD is the fourth highest cause of death
  - Estimated to become the third leading cause of death by 2020
- In the United States:
  - In 2011, 6.5% of the US population had COPD
  - In 2010, there were 133,575 deaths caused by COPD
  - Overall, death rates for COPD have not declined

GOLD Guidelines 2019.  www.goldcopd.org
Age Adjusted Prevalence of COPD in adults ≥25 years of age in 2011

Age Adjusted Death-rates (per 100,000) of COPD in adults ≥25 years of age between 1999-2000

COPD Prevalence

Age Adjusted Death-rates (per 100,000) of COPD in adults ≥25 years of age between 2009-2010

Risk Factors

- Genetic factors
  - Alpha-1 antitrypsin deficiency
- Age and gender
- Lung growth and development
- Exposure to particles
  - Cigarette smoking
- Socioeconomic status—questionable
- Asthma/bronchial hyper-reactivity
- Chronic bronchitis
- Infections

GOLD Guidelines 2019.  www.goldcopd.org
COPD Treatment

- Pharmacologic treatment
  - No agent has been shown to decrease mortality for COPD patients
  - Reduces COPD symptoms, frequency of exacerbations, and improve health status
- Smoking cessation
  - Slows disease progression
- Oxygen therapy
  - Increases survival in patients with severe resting hypoxemia
- Pulmonary rehabilitation

GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
COPD Symptoms and Diagnosis

• Symptoms
  – Dyspnea
  – Cough
  – Sputum production
  – Wheezing and chest tightness

• Diagnosis
  – Spirometry demonstrating post-bronchodilator $FEV_1/FVC <0.70$

GOLD Guidelines 2019. www.goldcopd.org
Blood Eosinophil Count

- Eosinophils are part of the innate immune system
  - Contains different types of anti-inflammatory enzymes
- Predicts ICS effectiveness (when added to regular maintenance bronchodilators)

<table>
<thead>
<tr>
<th>Eosinophil Count</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100 cells/µL</td>
<td>Low likelihood of efficacy/benefit</td>
</tr>
<tr>
<td>&gt;300 cells/µL</td>
<td>Greatest likelihood of benefit</td>
</tr>
</tbody>
</table>

Normal Spirometry

Adapted from: GOLD Guidelines 2019.  www.goldcopd.org
Spirometry in Obstructive Disease

Adapted from: GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
ABCD Assessment Tool

Confirm dx via spirometry

Assess Airflow Limitation

Asses symptoms and exacerbation risk

Adapted from: GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
## GOLD Classification

<table>
<thead>
<tr>
<th>GOLD Grade</th>
<th>Severity</th>
<th>FEV₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD 1</td>
<td>Mild</td>
<td>FEV₁ ≥ 80% predicted</td>
</tr>
<tr>
<td>GOLD 2</td>
<td>Moderate</td>
<td>50% ≤ FEV₁ &lt; 80% predicted</td>
</tr>
<tr>
<td>GOLD 3</td>
<td>Severe</td>
<td>30% ≤ FEV₁ &lt; 50% predicted</td>
</tr>
<tr>
<td>GOLD 4</td>
<td>Very severe</td>
<td>FEV₁ &lt; 30% predicted</td>
</tr>
</tbody>
</table>

GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
<table>
<thead>
<tr>
<th>Exacerbation History</th>
<th>CAT &lt; 10 mMRC 0-1</th>
<th>CAT ≥ 10 mMRC ≥2</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥2/year OR ≥1 leading to admit</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>0-1 exacerbation/year</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
COPD Treatment
Common Agents

• Inhalers
  – Beta agonists
    • Short vs. long acting
  – Anticholinergics
    • Short vs. long acting
  – Corticosteroids
  – Combination inhalers

• Oral agents
  – Methylxanthines
    • Theophylline
    • Aminophylline
  – Phosphodiesterase-4 inhibitor (PDE4 inhibitor)
    • Roflumilast (Daliresp®)
  – Systemic corticosteroids
  – Mucolytic agent (not approved)
    • Erdosteine

GOLD Guidelines 2019. www.goldcopd.org
COPD Treatment Inhalers

• Beta$_2$-agonists
  – SABA: Short-acting beta agonists
    • Albuterol, levalbuterol
  – LABA: Long-acting beta agonists
    • Formoterol, aformoterol, indacaterol, salmterol, olodaterol

• Anticholinergics (muscarinic agents)
  – SAAC: Short-acting anticholinergics
    • Ipratropium
  – LAAC: Long-acting anticholinergics
    • Aclidinium, tiotropium, glycopyrrolate, umeclidinium

• Corticosteroids
  – ICS—inhaled corticosteroid—always in combination inhalers

GOLD Guidelines 2019. www.goldcopd.org
Previous Guidelines

### 2016 COPD Treatment Selection

<table>
<thead>
<tr>
<th>Group</th>
<th>First Line</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>Theophylline</td>
</tr>
<tr>
<td>B</td>
<td>LABA+LAAC or LAAC+PDE4 inhibitor or LABA+PDE4 inhibitor</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>LABA+LAAC or LABA+PDE4 inhibitor</td>
<td></td>
</tr>
</tbody>
</table>

GOLD Guidelines 2016
# ABCD Assessment Tool

<table>
<thead>
<tr>
<th>Exacerbation History</th>
<th>CAT &lt; 10</th>
<th>CAT ≥ 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥2/year OR ≥1 leading to admit</td>
<td>mMRC 0-1</td>
<td>mMRC ≥2</td>
</tr>
<tr>
<td>0-1 exacerbations/year</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
<table>
<thead>
<tr>
<th></th>
<th>Initial Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>LAMA</td>
</tr>
<tr>
<td>D</td>
<td>LAMA or LAMA+LABA* or ICS+LABA**</td>
</tr>
<tr>
<td></td>
<td>*If highly symptomatic</td>
</tr>
<tr>
<td></td>
<td>**EOS ≥300</td>
</tr>
<tr>
<td>A</td>
<td>Long acting bronchodilator (LABA or LAMA)</td>
</tr>
</tbody>
</table>

GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
Management Cycle

Review
- Symptoms
- Exacerbations

Assess
- Technique
- Non-drug tx

Adjust
- Escalate
- Switch device or drug
- De-escalate

Adapted from: GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
Treatment Strategy: Dyspnea

LABA or LAMA

LABA + LAMA

• Consider switching device or drug
• Evaluate and treat other causes of dyspnea

LABA + LAMA + ICS

LABA + ICS

De-escalation

De-escalation of ICS if:
• Pneumonia
• Inappropriate original indication
• Lack of response

LABA: Long-acting β agonist
LAMA: Long-acting anti-muscarinic
ICS: Inhaled corticosteroid

Adapted from: GOLD Guidelines 2019. www.goldcopd.org
Treatment Strategy: Exacerbations

- **LABA or LAMA**
- **LABA + LAMA**
- **LABA + ICS**
- **LABA + LAMA + ICS**

**LABA**:
- Long-acting β agonist

**LAMA**:
- Long-acting anti-muscarinic

**ICS**:
- Inhaled corticosteroid

**EOS**:
- Eosinophils

- **EOS >100**
- **EOS <100**

De-escalation of ICS if:
- Pneumonia
- Inappropriate original indication
- Lack of response

**Roflumilast**
- FEV1<50% + chronic bronchitis

**Azithromycin**
- In former smokers

Adapted from: GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
COPD Treatment

• Methods of inhalation administration
  – Metered dose inhalers
  – Soft mist inhalers
  – Dry powder inhalers
  – Nebulizer solutions
COPD Treatment

• Metered dose inhaler
  – Medication is administered as aerosol with propellant
  – Actuation and inhalation require coordination
    • Can use with spacer to help with coordination
  – Patient should inhale slowly
  – Priming is required
  – Shake before use
COPD Treatment

- Dry powder inhaler
  - Multiple forms on the market
  - Medication is in powder form
    - No propellant
  - Patient inhalation triggers actuation
  - Coordination is not necessary
    - Spacer cannot be used
  - Patient should inhale quickly
    - Relies on peak inspiratory flow
COPD Treatment

• Nebulizers
  – Medication is in liquid form
  – Device uses compressed air to aerosolize medication
    • Nebulization device is bulky and requires electricity
    • Administration time is prolonged compared to other devices
  – No coordination required
MDI

• Ingredients
  – Albuterol—ProAir HFA®
  – Albuterol and ipratropium—Combivent®
  – Budesonide and formoterol—Symbicort®

• Counseling points
  – Priming
    • Spray away from face 3 times
      – Shake before each spray
    • Will need to be re-primed if not used for 3 weeks

ProAir® PI. Horsham, PA: Teva Respiratory LLC; 2018.
MDI

• Counseling points
  – Administration:
    • Shake well
    • Breathe out through the mouth
    • Mouthpiece in mouth
    • Seal lips around the mouthpiece
    • Push the canister down while breathing in slowly and deeply
    • Hold breath for ~10 seconds
    • Breathe out slowly
    • Wait 1 minute between doses

ProAir® PI. Horsham, PA: Teva Respiratory LLC; 2018.
MDI

• Counseling points
  – Clean the device once per week
    • Remove the canister
    • Run the actuator under warm running water through both the top and through the mouth piece for 30 seconds each
    • Let dry overnight
    • Replace the canister and spray twice away from the face

ProAir® PL. Horsham, PA: Teva Respiratory LLC; 2018.
MDI

• Symbicort® specific information
  – Only requires 2 sprays for priming
    • Re-prime if not in use for 7 days
  – Rinse mouth out with water and spit
  – Wipe mouthpiece every 7 days with a
    clean, dry cloth

Neohaler®

• DPI—capsule
• Ingredients:
  – Indacaterol
  – Glycopyrrolate
  – Combo

Neohaler®

- Counseling points:
  - Capsule is pierced by buttons on the side of the device
  - Whirring noise as patient is breathing in
  - After dose administration, pt to open the device and check for remaining power
    - Take another inhalation if there is powder left
  - Not meant to be washed

Diskus®

- DPI—preloaded
- Ingredients
  - Fluticasone
  - Fluticasone/Salmeterol

Diskus®

• Counseling points
  – Needs to be held in a level, flat position (think: hamburger)
  – Once the dose is activated it needs to be inhaled
  – Do not breathe into the mouthpiece
  – Not meant to be washed

Pressair®

- DPI—preloaded
- Ingredients
  - Aclidinium

Tudorza® PI. Wilmington, DA: AstraZeneca Pharmaceuticals; 2018.
Pressair®

- Counseling points
  - Inhaler held horizontally with the green button on top
  - Cannot be tilted
  - Indicator window
    - Red → green when dose is loaded
    - Green → red after dose administered
  - Good for 45 days after opening
  - Not meant to be washed

Tudorza® PI. Wilmington, DA: AstraZeneca Pharmaceuticals; 2018.
Handihaler®

- DPI—capsule
- Ingredients:
  - Tiotropium

Spiriva® PI. Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals; 2018.
Handihaler®

• Counseling points
  – Do not pierce the capsule more than once
  – Breathe from the same capsule twice
  – Capsules should not be stored in the device
  – Can be cleaned, but takes 24 hours to fully dry

Spiriva® PI. Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals; 2018.
Ellipta®

- DPI—preloaded
- Ingredients
  - Umeclidinium and vilanterol—Anoro®
  - Fluticasone, umeclidinium, and vilanterol—Trelegy®
  - Fluticasone and vilanterol—Breo®
  - Umeclidinium—Incruse®
  - Fluticasone—Arnuity®

• Counseling points
  – Do not block the air vents during inhalation
  – Opening the cover loads a dose
    • If the cover is closed before the dose is inhaled, the dose will be lost
  – 1 breath per dose
  – Discard 6 weeks after opening the tray

• **Soft-mist inhaler**

• **Ingredients**
  - Ipratropium and albuterol
  - Tiotropium—Spiriva®
  - Olodaterol—Striverdi®
  - Tiotropium and olodaterol—Stiolto®
Respimat®

Spiriva® Respimat® PI. Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals; 2018.
• Counseling points
  – Discard 3 months after cartridge inserted
  – Prepare for first use (after cartridge insertion)
    • Turn the clear base clockwise until it clicks
    • Open cap
    • Point inhaler to the ground and press gray dose-release button
    • Repeat until mist is seen
    • After mist is seen, repeat 3 more times

Spiriva® Respimat® Pl.  Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals; 2018.
Respimat®

• Counseling points
  – If not used for extended period:
    • 3 days—release 1 puff to the ground
    • 21 days—go through “prepare for first use” until mist is visible, then repeat 3 more times
  – Inhaler will lock up after the number of doses have been used
  – Keep the cap closed when loading the dose

Spiriva® Respimat® PI. Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals; 2018.
# Inhalers and Ingredients

<table>
<thead>
<tr>
<th>Inhaler</th>
<th>LABA</th>
<th>LAMA</th>
<th>ICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbicort®</td>
<td>Formoterol</td>
<td></td>
<td>Budesonide</td>
</tr>
<tr>
<td>Arcapta® Neohaler®</td>
<td>Indacaterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seebri® Neohaler®</td>
<td></td>
<td>Glycopyrrolate</td>
<td></td>
</tr>
<tr>
<td>Utibron® Neohaler®</td>
<td>Indacaterol</td>
<td>Glycopyrrolate</td>
<td></td>
</tr>
<tr>
<td>Advair® Diskus®</td>
<td>Salmeterol</td>
<td></td>
<td>Fluticasone</td>
</tr>
<tr>
<td>Tudorza® Pressair®</td>
<td></td>
<td>Aclidinimum</td>
<td></td>
</tr>
<tr>
<td>Spiriva® Handihaler®</td>
<td></td>
<td>Tiotropium</td>
<td></td>
</tr>
<tr>
<td>Anoro® Ellipta®</td>
<td>Vilanterol</td>
<td>Umeclidinium</td>
<td></td>
</tr>
<tr>
<td>Breo® Ellipta®</td>
<td>Vilanterol</td>
<td></td>
<td>Fluticasone</td>
</tr>
<tr>
<td>Incruse® Ellipta®</td>
<td></td>
<td>Umeclidinium</td>
<td></td>
</tr>
<tr>
<td>Trelegy® Ellipta®</td>
<td>Vilanterol</td>
<td>Umeclidinium</td>
<td>Fluticasone</td>
</tr>
<tr>
<td>Spiriva® Respimat®</td>
<td></td>
<td>Tiotropium</td>
<td></td>
</tr>
<tr>
<td>Stiolt® Respimat®</td>
<td>Olodaterol</td>
<td>Tiotropium</td>
<td></td>
</tr>
<tr>
<td>Striverdi® Respimat®</td>
<td>Olodaterol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Inhalers and Ingredients

<table>
<thead>
<tr>
<th>Inhaler</th>
<th>LABA</th>
<th>LAMA</th>
<th>ICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arcapta® Neohaler®</td>
<td>Indacaterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Striverdi® Respimat®</td>
<td>Olodaterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tudorza® Pressair®</td>
<td></td>
<td>Acclidinium</td>
<td></td>
</tr>
<tr>
<td>Seebri® Neohaler®</td>
<td></td>
<td>Glycopyrrolate</td>
<td></td>
</tr>
<tr>
<td>Spiriva® Handihaler®</td>
<td></td>
<td>Tiotropium</td>
<td></td>
</tr>
<tr>
<td>Spiriva® Respimat®</td>
<td></td>
<td>Tiotropium</td>
<td></td>
</tr>
<tr>
<td>Incruse® Ellipta®</td>
<td></td>
<td>Umeclidinium</td>
<td></td>
</tr>
<tr>
<td>Utibron® Neohaler®</td>
<td>Indacaterol</td>
<td>Glycopyrrolate</td>
<td></td>
</tr>
<tr>
<td>Stiolto® Respimat®</td>
<td>Olodaterol</td>
<td>Tiotropium</td>
<td></td>
</tr>
<tr>
<td>Anoro® Ellipta®</td>
<td>Vilanterol</td>
<td>Umeclidinium</td>
<td></td>
</tr>
<tr>
<td>Symbicort®</td>
<td>Formoterol</td>
<td></td>
<td>Budesonide</td>
</tr>
<tr>
<td>Advair® Diskus®</td>
<td>Salmeterol</td>
<td></td>
<td>Fluticasone</td>
</tr>
<tr>
<td>Breo® Ellipta®</td>
<td>Vilanterol</td>
<td></td>
<td>Fluticasone</td>
</tr>
<tr>
<td>Trelegy® Ellipta®</td>
<td>Vilanterol</td>
<td>Umeclidinium</td>
<td>Fluticasone</td>
</tr>
</tbody>
</table>
OTHER INHALERS NOT APPROVED/APPROPRIATE FOR COPD
Respiclick®

- DPI—preloaded
- Ingredients
  - Albuterol

Not indicated for COPD

Proair® Respiclick® PI. Horsham, PA: Teva Respiratory LLC; 2018.
Respiclick®

• Counseling points
  – Do not use if allergic to lactose or milk proteins
  – Do not open the cap unless the medication is about to be administered
  – Hold the inhaler upright
  – There is no activation button
  – Do not block the vent
  – Do not wash

Proair® Respiclick® PI. Horsham, PA: Teva Respiratory LLC; 2018.
Flexhaler®

• DPI—preloaded
• Ingredient
  – Budesonide
• Not indicated for COPD

Pulmicort® Flexhaler® PI. Wilmington, DE: AstraZeneca; 2016.
Flexhaler®

- Counseling points
  - Dose loading
    - Twist the white cover off
    - Hold the inhaler upright
    - Twist the brown grip in one direction as far at it will go, then twist fully back in the other direction as far as it will go
      - Initial direction doesn’t matter
    - Will hear a click during one of the twisting movements

Pulmicort® Flexhaler® PI. Wilmington, DE: AstraZeneca; 2016.
Flexhaler®

• Counseling points
  – The inhaler will not load more doses for multiple turns
    • Counter will say zero but doses will still be in the device
  – The dose counter only moves with about every 5 doses
  – Do not wash it

Pulmicort® Flexhaler® PI. Wilmington, DE: AstraZeneca; 2016.
Twisthaler®

- DPI—preloaded
- Ingredient
  - Mometasone
- Not indicated for COPD

Twisthaler®

- Counseling points
  - Good for 45 days after date removed from pouch
  - Dose loading
    - Twist the white cover off
    - Hold the inhaler upright
    - Twist the base counterclockwise to both remove the cap AND load a dose
    - Replacing the cap to the indented arrow ensures dose is properly loaded

ADJUNCTIVE THERAPIES
Smoking Cessation

Lung function vs. age and the relationship between smoking and lung function decline

Parkes G. BMJ. 2008;336(7644):598-600
Smoking Cessation

Loss of lung function over 11 years based on smoking status

Smoking Cessation

• Counseling delivered by healthcare professionals increases quit rates
• Brief strategies to help the patient willing to quit (the 5 A’s):
  – Ask—identify all tobacco users
  – Advise—strongly urge all tobacco users to quit
  – Assess—determine willingness to make a quit attempt
  – Assist—aid the patient in quitting
  – Arrange—schedule follow-up contact

GOLD Guidelines 2019.  www.goldcopd.org
Immunizations

• Review the immunization history for all patients
  – Can be done in community setting, clinic setting, or hospital setting
  – Follow guidelines from the Centers for Disease Control Advisory Committee on Immunization Practices (CDC ACIP)
    – Guidelines are released yearly

• Available from:
  – http://www.cdc.gov/vaccines/schedules/hcp/adult.html

GOLD Guidelines 2019. www.goldcopd.org
Immunizations

- Influenza vaccination
  - Inactivated influenza vaccine (IIV) recommended yearly
  - A list of available flu vaccines can be found here:
    - http://www.cdc.gov/flu/protect/vaccine/vaccines.htm
  - 18-64 years of age may receive intradermal or intramuscular IIV
  - >65 years of age may receive the standard IIV or the high-dose IIV

- Benefits
  - Reduces exacerbations
  - Reduces influenza infections
  - Decreases risk of death

Immunizations

- Pneumococcal vaccination
  - All COPD patients 19-64 years of age should receive PPSV23
  - At age $\geq 65$ years:
    - Administer PCV13 at least one year after PPSV23
    - Followed by another PPSV23 at least one year after PCV13 and at least 5 years after PPSV23

- Benefits
  - Reduces community acquired pneumonia caused by pneumococcus
  - Reduces pneumonia caused by both pneumococcus and unknown etiology for COPD patients $< 65$ years of age and $\text{FEV}_1 < 40\%$ predicted

GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)
Pneumococcal Vaccine

PPSV23 (19-64yoa) 1 yr apart  PPSV13 >65yoa 1 yr apart  PPSV23 >65yoa

At least 5 years apart

Considerations

• Disease is progressive—but therapy may be stepped down

• Counseling
  – Role of maintenance versus rescue medication
  – Inhaler devices
    • Check use at each visit
    • Demonstrate technique for patient
    • Utilize teach-back
QUESTIONS??
Assessment Questions

• Which of the following has been proven to decrease mortality in patients with COPD?
  – Use of dry-powder inhalers
  – Monotherapy with inhaled corticosteroids
  – Smoking cessation
  – Avoiding the use of supplementary oxygen in all COPD patients
Assessment Questions

• Which of the following inhalers requires forceful inhalation?
  – Ellipta®
  – Respimat®
  – Metered dose inhaler
  – Neohaler®
Assessment Questions

• KL has had COPD for approximately 5 years. On her last visit to her physician, her CAT score was 15 and she has had a lot of dyspnea. She has had no exacerbations. She has been previously stable with prn albuterol. What agent would you recommend for her?
  – Continue PRN albuterol as no additional medication is warranted
  – Arcapta® Neohaler®--indacaterol
  – Anoro® Ellipta®--vilanterol+umeclidinium
  – Symbicort®--formoterol+budesonide
Treatment Strategy: Dyspnea

LABA or LAMA

LABA + LAMA
- Consider switching device or drug
- Evaluate and treat other causes of dyspnea

LABA + LAMA + ICS

LABA + ICS

De-escalation

De-escalation of ICS if:
- Pneumonia
- Inappropriate original indication
- Lack of response

Adapted from: GOLD Guidelines 2019. [www.goldcopd.org](http://www.goldcopd.org)

LABA: Long-acting β agonist
LAMA: Long-acting anti-muscarinic
ICS: Inhaled corticosteroid
Assessment Questions

• KL has been taking the Arcapta® Neohaler® (indacaterol) but has been having worsening dyspnea. What agent would you recommend for her?
  – Striverdi® Respimat®--Olodaterol
  – Seebri® Neohaler®--Glycopyrrolate
  – Utibron® Neohaler®--Indacaterol+glycopyrrolate
  – Breo® Ellipta®--Vilanterol+Umeclidinium
Treatment Strategy: Dyspnea

LABA or LAMA

LABA + LAMA

• Consider switching device or drug
• Evaluate and treat other causes of dyspnea

LABA + LAMA + ICS

LABA + ICS

De-escalation

De-escalation of ICS if:
• Pneumonia
• Inappropriate original indication
• Lack of response

Adapted from: GOLD Guidelines 2019. www.goldcopd.org

LABA: Long-acting β agonist
LAMA: Long-acting anti-muscarinic
ICS: Inhaled corticosteroid
-Assessment Questions-

- DW has had COPD for approximately 10 years. On his last visit to his physician, his CAT score was 8, but he has had 2 exacerbations leading to hospitalization. He had been previously stable with Arcapta® Neohaler®. His eosinophil count is 454. What agent would you recommend?
  - Arcapta® Neohaler®--indacaterol
  - Trelegy® Ellipta®--vilanterol+umeclidinium+fluticasone
  - Stiolto® Respimat®--olodaterol+tiotropium
  - Symbicort®--formoterol+budesonide
Treatment Strategy: Exacerbations

- **LABA or LAMA**
- **LABA + LAMA**
- **LABA + ICS**
- **LABA + LAMA + ICS**

**De-escalation of ICS if:**
- Pneumonia
- Inappropriate original indication
- Lack of response

- **EOS > 300 or EOS > 100+ > 2 exac/1hosp**
- **EOS < 100**

- **EOS > 100**

- **Roflumilast**
  - FEV1 < 50% + chronic bronchitis

- **Azithromycin**
  - In former smokers

LABA: Long-acting β agonist
LAMA: Long-acting antimuscarinic
ICS: Inhaled corticosteroid
EOS: Eosinophils

Adapted from: GOLD Guidelines 2019. www.goldcopd.org
Assessment Questions

• HG has long standing COPD. He received an PPSV 23 in 2011 when he turned 65. What pneumococcal vaccine should he receive now?
  – No pneumococcal vaccine is recommended at this time.
  – Another PPSV with a PCV13 in 5 years
  – A PCV 13 followed by a PPSV23 in 5 years
  – A PCV13 followed by a PPSV23 in 1 year
Assessment Questions

• RF is a 64 year old who has been recently diagnosed with COPD. She has never received a pneumococcal vaccine before. What pneumococcal vaccine schedule should she follow?
  – PPSV 23 when she turns 65 followed by a PCV 13 in 5 years
  – PCV13 now then PPSV in 1 year followed by another PCV13 1 year after that
  – PPSV 23 now, PCV13 in 1 year, PPSV23 1 year after that
  – PPSV23 now and PCV 13 in 5 years
Assessment Questions

- RB is a 67 year old who has been recently diagnosed with COPD. He has never received a pneumococcal vaccine before. What pneumococcal vaccine schedule should he follow?
  - PPSV 23 now followed by a PCV 13 in 1 year
  - PCV13 now then PPSV in 1 year followed by another PCV13 1 year after that
  - PPSV 23 now, PCV13 in 1 year, PPSV23 1 year after that
  - PPSV23 now and PCV 13 in 5 years
COPD: Guidelines and Devices Update

Amber M. Hutchison, PharmD, BCPS, BCGP
Associate Clinical Professor
Auburn University
Harrison School of Pharmacy