

# **COPD 2023: GOLD Guideline Update**

## **AAPA Annual Conference**

**Brian Bizik MS PA-C  
Asthma and COPD Care Coordinator  
Terry Reilly Health Centers, Boise Idaho**

**President and Conference Chair  
American Academy of Physician Assistants in  
Allergy, Asthma and Immunology**

**208-404-5338  
brianbizik@yahoo.com**

# Disclosures

## **TEACHING**

Idaho State University PA and NP Programs  
ThriveAP

## **INDUSTRY AFFILIATIONS**

Grifols Pharmaceuticals - speaker, consultant

## **CLINICAL RESEARCH**

2017 – Sub-I, Genentech Zenyatta Severe Asthma Study

2016 – Sub-I, Biota Human Rhinovirus Study

2015 – Sub-I, Sanofi Traverse Severe Asthma Study

2015 – Sub-I, Sanofi Liberty Severe Asthma Study

2013 – Study Coordinator: MediVector Influenza Study

**Brian Bizik does not** intend to discuss the use of any off-label use/unapproved use of drugs or devices that he represents

# **Big Goals**

**Review the three categories of medications available to treat COPD**

**Key in on the diagnosis and treatment, why PFT numbers should not guide treatment – and how the 2023 guidelines have changed**

**Best practices and personalizing COPD treatment**

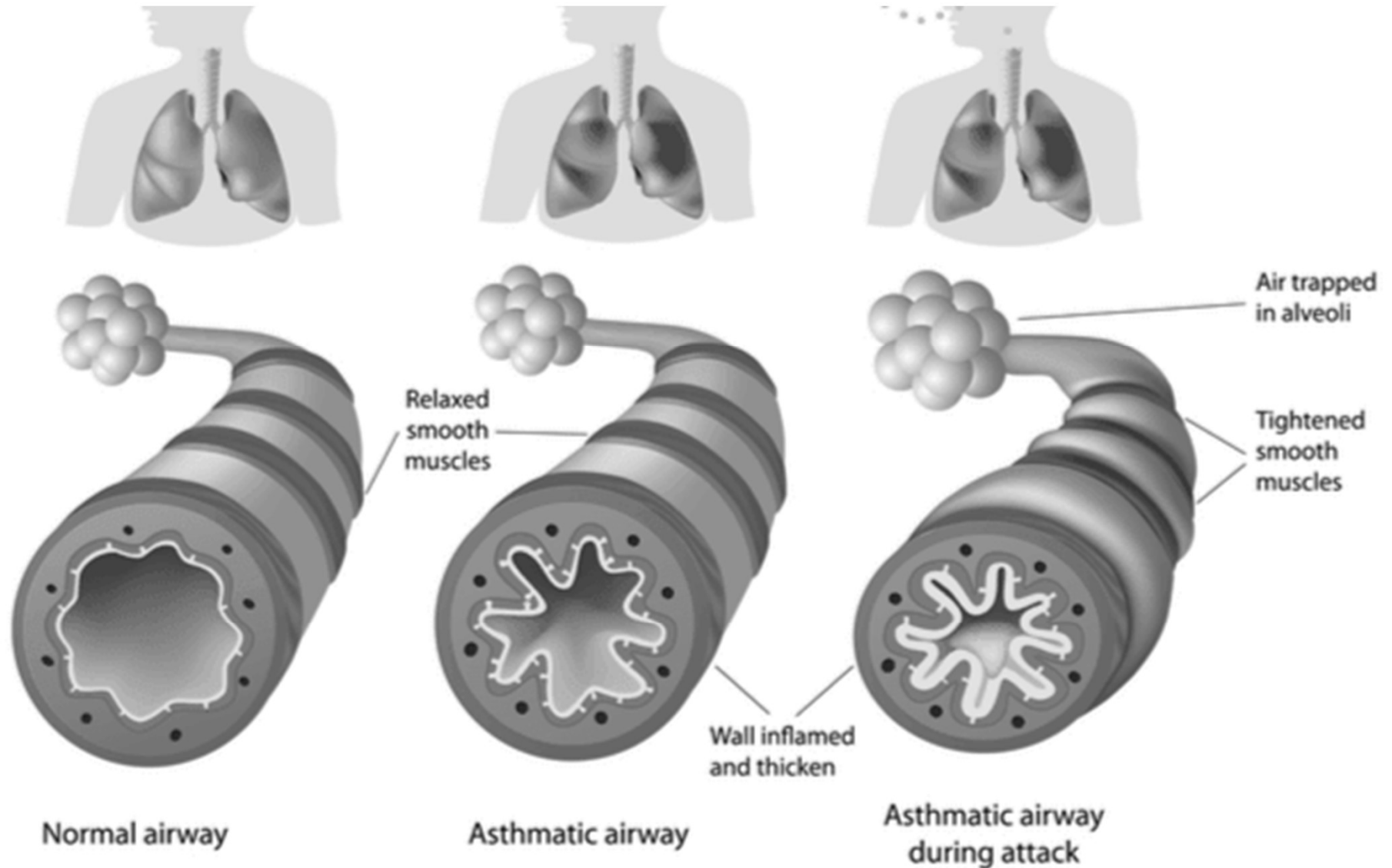
# **Asthma vs COPD**

# **Asthma and COPD**

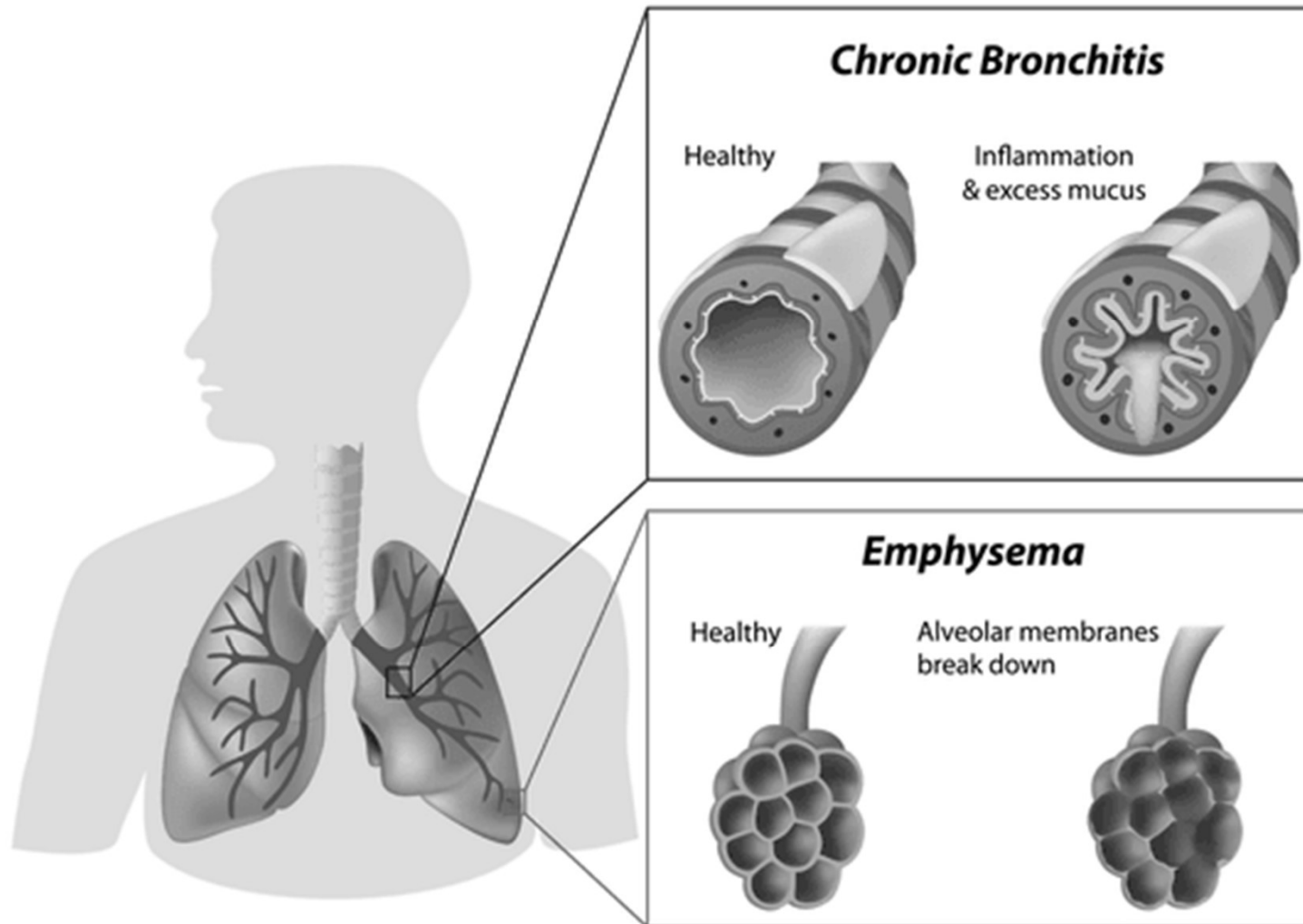
**Asthma – bronchoconstriction, airway inflammation, mucous production**

**COPD – Tissue destruction, chronic cough, due to exposure**

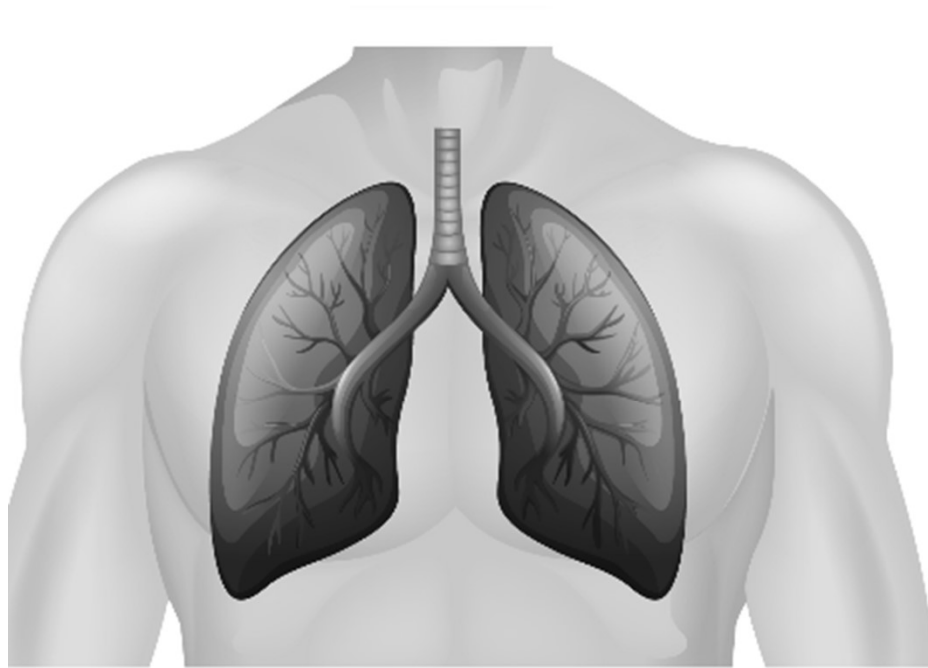
# Asthma – Three key features: bronchoconstriction, airway inflammation and mucous production.



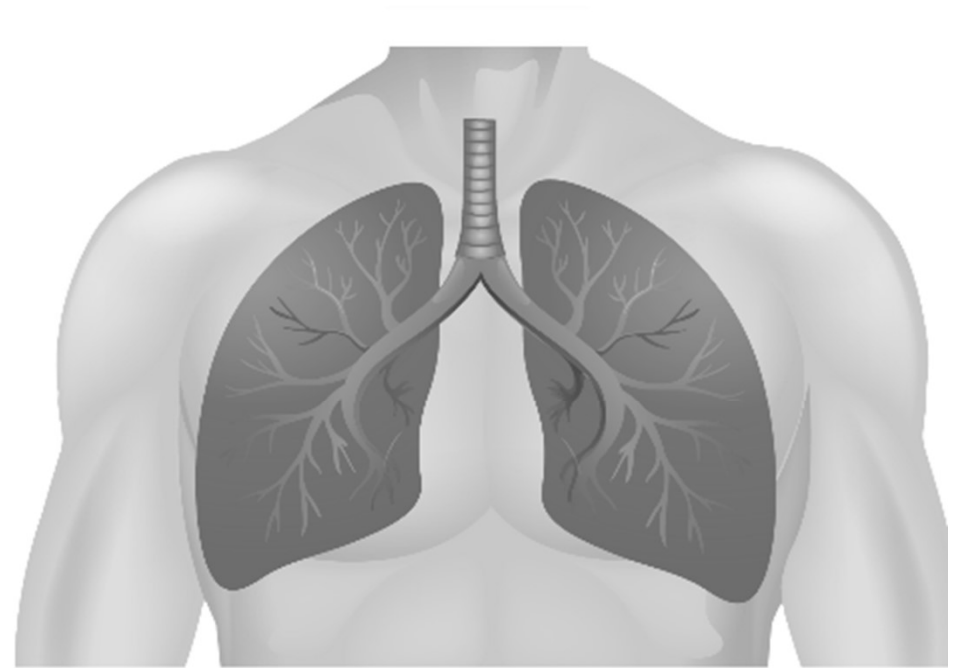
**COPD – Chronic (long term, you get this over time), Obstructive (elasticity is gone, things get floppy and weak, alveoli break down)**



**COPD – Big, floppy lungs. Flattened diaphragm. Harder to inhale but MUCH harder to exhale, air is trapped, stale.**

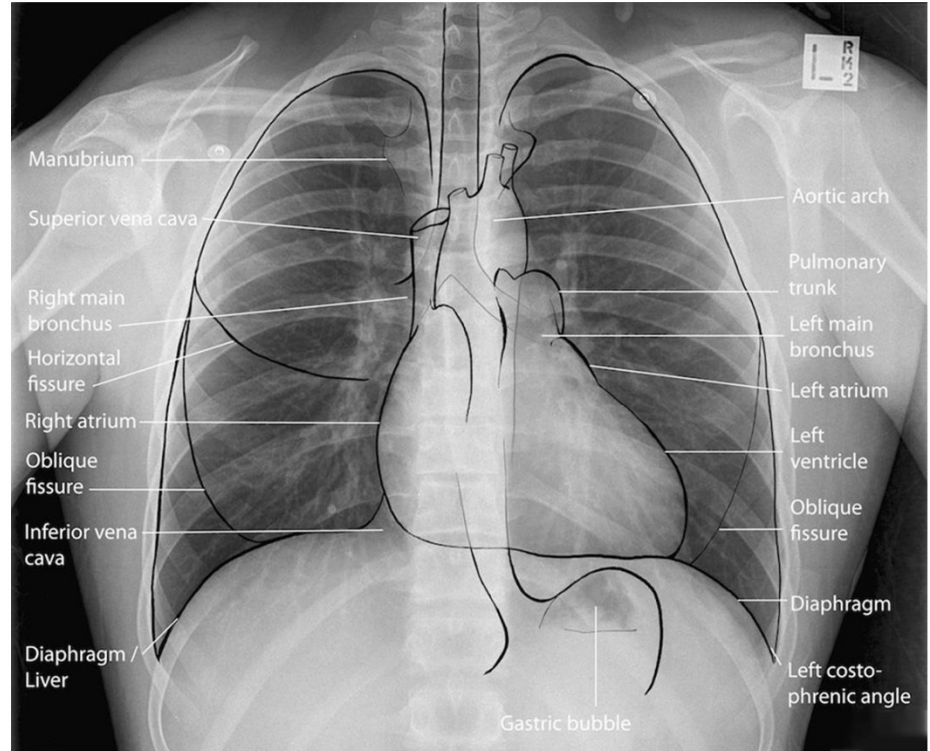
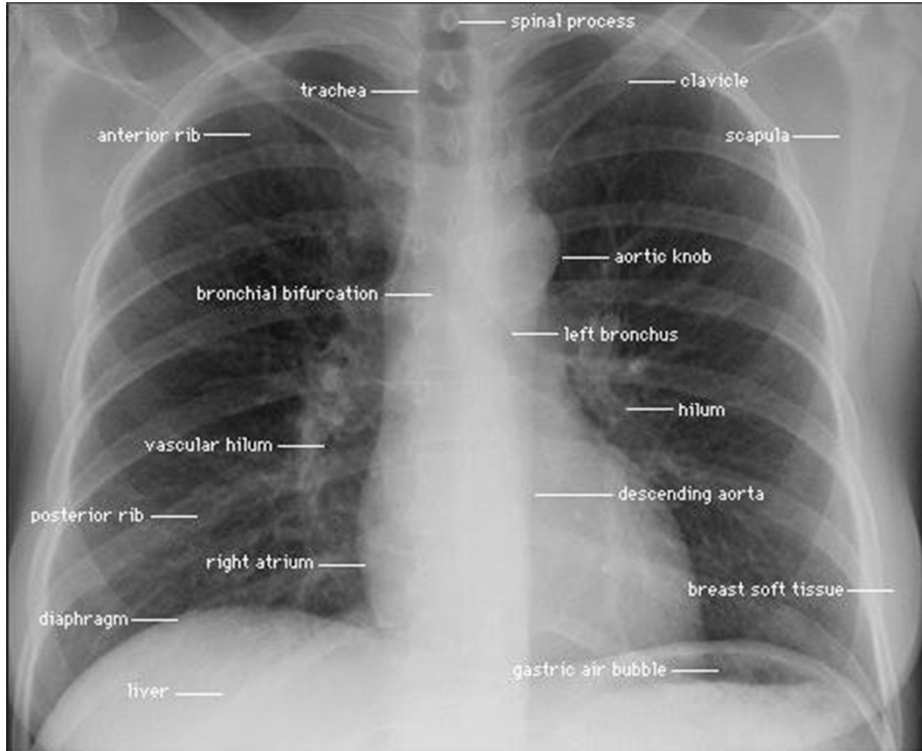


**Normal Lungs**



**Hyperinflated Lungs**







# COPD Medication Terms

- SABA = Short Acting Beta-Agonist = Albuterol = rescue inhaler = puffer, Proair, Ventolin, Proventil
- LABA = Long Acting Beta-Agonist, Serevent, Salmeterol
- ICS = Inhaled Corticosteroid, Flovent, fluticasone, QVAR, Pulmicort
- SAMA= Short Acting Muscarinic Antagonist, ipratropium bromide
- LAMA = Long Acting Muscarinic Antagonist, Spiriva, tiotropium
- MDI = Metered Dose Inhaler
- DPI = Dry Powdered Inhaler – Advair, Breo, Trelegy
- SMI = Soft Mist Inhaler

# COPD: Part 1

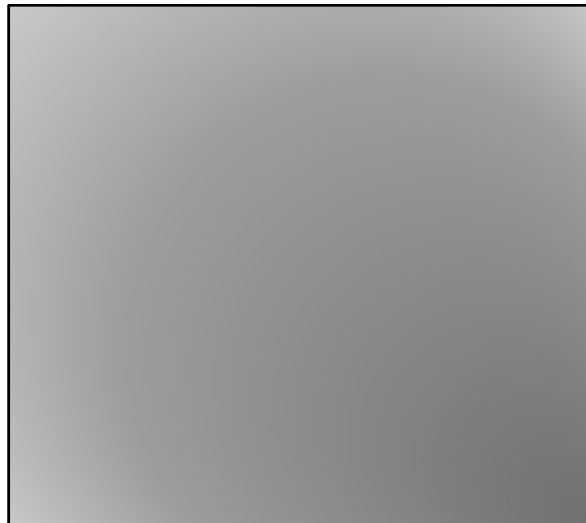
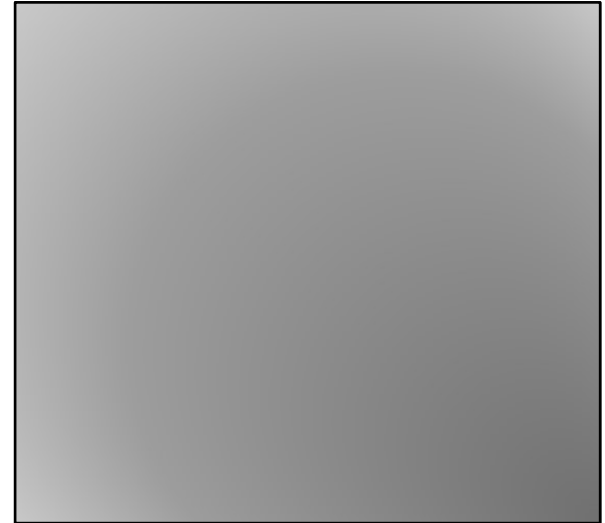
We have three categories of medications

## Albuterol

Short – SABA

Long – LABA

Bronchodilators



# **COPD Medication Categories**

Albuterol – short acting bronchodilator, relaxes smooth muscle. Binds to beta receptors on smooth muscle, causing about a billion things to happen that drop the calcium in the cell and it relaxes.

Salmeterol/formoterol/vilanterol – Same thing as above but lasts 12 or 24 hours

AllergyAsthmaNetwork.org  
800.878.4403

## SHORT-ACTING BETA<sub>2</sub>-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

**ProAir® Digihaler™**  
90 mcg albuterol sulfate inhalation powder  
D5B A



**ProAir® HFA**  
90 mcg albuterol sulfate  
D5B A G



**ProAir® RespiClick®**  
90 mcg albuterol sulfate inhalation powder  
D5B A



**Proventil® HFA**  
90 mcg albuterol sulfate  
D5B A G



**Ventolin® HFA**  
90 mcg albuterol sulfate  
D5B A G



**Xopenex®**  
45 mcg levalbuterol tartrate  
A G



## LONG-ACTING BETA<sub>2</sub>-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer lasting relief of symptoms such as coughing, wheezing and shortness of breath for at least 12 hours

**Serevent® Diskus®**  
50 mcg salmeterol xinafoate inhalation powder  
D5B A C



**Striverdi® RespiMat®**  
2.5 mcg olodaterol hydrochloride  
D5B C



## INHALED CORTICOSTEROIDS

**Alvesco® HFA**  
80, 160 mcg ciclesonide  
D5B A



**ArmonAir® Digihaler™**  
55, 113, 232 mcg fluticasone propionate inhalation powder  
D5B A



**Arnuity® Ellipta®**  
50, 100, 200 mcg fluticasone furoate inhalation powder  
D5B A



**Asmanex® HFA**  
50, 100, 200 mcg mometasone furoate  
D5B A



**Asmanex® Twisthaler®**  
110, 220 mcg mometasone furoate inhalation powder  
D5B A



**Flovent® Diskus®**  
50, 100, 250 mcg fluticasone propionate inhalation powder  
D5B A



**Flovent® HFA**  
44, 110, 220 mcg fluticasone propionate  
D5B A



**Pulmicort Flexhaler®**  
90, 180 mcg budesonide inhalation powder  
D5B A




**QVAR® Redihaler™**  
40, 80 mcg beclomethasone dipropionate  
D5B A




## MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)

relieve cough, sputum production, wheeze and chest tightness associated with chronic lung diseases

**Short-acting**  
**Atrovent® HFA**  
17 mcg ipratropium bromide  
D5B C



**Long-acting**  
**Incruse® Ellipta®**  
62.5 mcg umecidinium inhalation powder  
D5B C



**Spiriva® HandiHaler®**  
18 mcg tiotropium bromide inhalation powder  
C



**Spiriva® RespiMat®**  
1.25, 2.5 mcg tiotropium bromide  
D5B A C



**Tudorza® Pressair™**  
400 mcg aclidinium bromide inhalation powder  
D5B C



## COMBINATION MEDICATIONS

contain both short-acting beta<sub>2</sub>-agonist and short-acting muscarinic antagonist

**Combivent® RespiMat®**  
20/100 mcg ipratropium bromide and albuterol  
D5B C



## COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta<sub>2</sub>-agonist (LABA)

**Advair Diskus®**  
100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol xinafoate inhalation powder  
D5B A C G



**Advair® HFA**  
45/21, 115/21, 230/21 mcg fluticasone propionate and salmeterol xinafoate  
D5B A G



**AirDuo® Digihaler™**  
55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol xinafoate inhalation powder  
A



**AirDuo® RespiClick®**  
55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol xinafoate inhalation powder  
D5B A G



**Breo® Ellipta®**  
100/25, 200/25 mcg fluticasone furoate and vilanterol inhalation powder  
D5B A C G



**Dulera®**  
50/5, 100/5, 200/5 mcg mometasone furoate and formoterol fumarate dihydrate  
D5B A



**Symbicort®**  
80/4.5, 160/4.5 mcg budesonide and formoterol fumarate dihydrate  
D5B A C G



**Wixela® Inhub™**  
100/50, 250/50, 500/50 mcg fluticasone propionate and aclidinium xinafoate (available only at Advair Diskus)  
D5B A C G



**Anoro® Ellipta®**  
62.5/25 mcg umecidinium and vilanterol inhalation powder  
D5B C



**Bevespi Aerosphere®**  
94.8 mcg glycopyrrolate and formoterol fumarate  
D5B C



**Duaklir® Pressair®**  
400, 12 mcg aclidinium bromide and formoterol fumarate  
D5B C



**Stiolto® RespiMat®**  
2.5/2.5 mcg tiotropium bromide and olodaterol  
D5B C



**Trelegy® Ellipta®**  
200/62.5/25 mcg, 100/62.5/25 mcg budesonide, fluticasone furoate, and vilanterol inhalation powder  
D5B A C



**Breztri Aerosphere™**  
180/9/4.8 mcg budesonide, glycopyrrolate and formoterol fumarate  
C



## BIOLOGICS

target cells and pathways that cause airway inflammation; delivered by injection or IV

**Cinqair®**  
reslizumab  
A



**Dupixent®**  
dupilumab  
A



**Fasenra®**  
benralizumab  
A



**Procris®**  
mepolizumab  
A

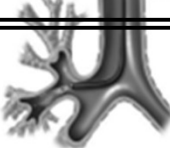


**Yervoy®**  
omalizumab  
A



## BRONCHIAL THERMOPLASTY

A minimally invasive procedure that uses radiofrequency energy to reduce airway smooth muscle, leading to fewer severe asthma flares, ER visits, and days lost from activities.  
www.bforasthma.com



## PDE4 INHIBITORS

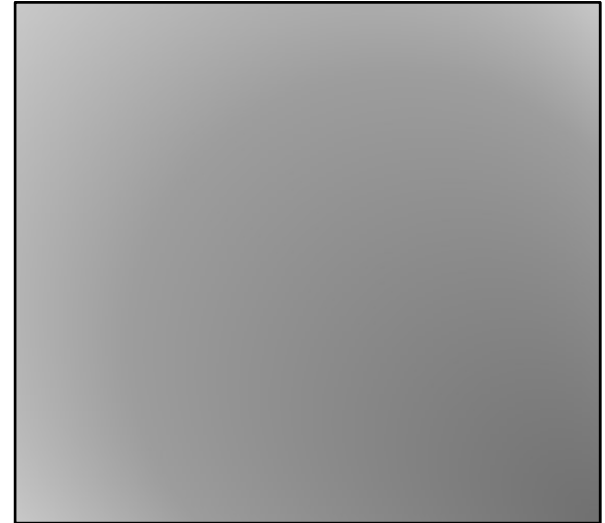
ease lung inflammation and reduce

**Daliresp®**  
250, 500 mcg roflumilast  
G



# COPD: Part 1

We have three categories of medications



## **Steroids**

All long acting

Reduce most  
every aspect of  
inflammation

# **COPD Medication Categories: Steroids**

Prednisone is metabolized by the liver to prednisolone. A glucocorticoid agonist corticosteroid

One of the first effects is to decreased the leukocyte migration to sites of Inflammation.

Corticosteroids then bind to the glucocorticoid receptor mediates changes in gene expression that lead to multiple downstream effects over hours to days.



# **COPD Medication Categories: Steroids**

Glucocorticoids inhibit WBC movement by slowing demargination; they inhibit phospholipase A2, which decreases the formation of arachidonic acid derivatives; they inhibit NF-Kappa B and other inflammatory transcription factors; they promote anti-inflammatory genes like interleukin.

Much of this happening in the nucleus

# **COPD Medication Categories: Steroids**

Many actions, all with a central goal of reducing inflammation at the source, most aspects of inflammation are affected

Steroids are a true two-edged sword



## SHORT-ACTING BETA<sub>2</sub>-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

<p><b>ProAir® Digihaler™</b> 90 mcg albuterol sulfate inhalation powder DSB A G</p>	<p><b>ProAir® HFA</b> 90 mcg albuterol sulfate DSB A G</p>	<p><b>ProAir® RespiClick®</b> 90 mcg albuterol sulfate inhalation powder DSB A</p>	<p><b>Proventil® HFA</b> 90 mcg albuterol sulfate DSB A G</p>	<p><b>Ventolin® HFA</b> 90 mcg albuterol sulfate DSB A G</p>	<p><b>Xopenex®</b> 45 mcg levalbuterol tartrate A G</p>
---	--	--	---	--	---

## LONG-ACTING BETA<sub>2</sub>-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer lasting relief of symptoms such as coughing, wheezing and shortness of breath for at least 12 hours

<p><b>Serevent® Diskus®</b> 50 mcg salmeterol xinafoate inhalation powder DSB A C</p>	<p><b>Striverdi® RespiMat®</b> 2.5 mcg olodaterol hydrochloride DSB C</p>
---	---

## INHALED CORTICOSTEROIDS

reduce and prevent swelling in airways

<p><b>Alvesco® HFA</b> 80, 160 mcg ciclesonide DSB A</p>	<p><b>ArmonAir® Digihaler™</b> 55, 113, 232 mcg fluticasone propionate inhalation powder DSB A</p>	<p><b>Arnuity® Ellipta®</b> 50, 100, 200 mcg fluticasone furoate inhalation powder DSB A</p>	<p><b>Asmanex® HFA</b> 50, 100, 200 mcg mometasone furoate DSB A</p>	<p><b>Asmanex® Twisthaler®</b> 110, 220 mcg mometasone furoate inhalation powder DSB A</p>	<p><b>Flovent® Diskus®</b> 50, 100, 250 mcg fluticasone propionate inhalation powder DSB A</p>	<p><b>Flovent® HFA</b> 44, 110, 220 mcg fluticasone propionate DSB A</p>	<p><b>Pulmicort Flexhaler®</b> 90, 180 mcg budesonide inhalation powder DSB A</p>	<p><b>QVAR® Redihaler™</b> 40, 80 mcg beclomethasone dipropionate DSB A</p>
--	--	--	--	--	--	--	---	---

## MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)

relieve cough, sputum production, wheezing and shortness of breath

<p><b>Atrovent® HFA</b> 17 mcg ipratropium bromide DSB C</p>	<p><b>Incruse® Ellipta®</b> 62.5 mcg umecidinium inhalation powder DSB C</p>	<p><b>Spiriva® HandiHaler®</b> 18 mcg tiotropium bromide inhalation powder C</p>	<p><b>Spiriva® RespiMat®</b> 1.25, 2.5 mcg tiotropium bromide DSB A C</p>	<p><b>Tudorza® Pressair™</b> 400 mcg aclidinium bromide inhalation powder DSB C</p>	<p><b>Combivent® RespiMat®</b> 20/100 mcg ipratropium bromide and albuterol DSB C</p>
--	--	--	---	---	---

## COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta<sub>2</sub>-agonist (LABA)

<p><b>Advair® HFA</b> 45/21, 115/21, 230/21 mcg fluticasone propionate and salmeterol xinafoate DSB A C G</p>	<p><b>Advair® Diskus®</b> 100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol xinafoate inhalation powder DSB A C G</p>	<p><b>AirDuo® Digihaler™</b> 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol xinafoate inhalation powder A</p>	<p><b>AirDuo® RespiClick®</b> 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol xinafoate inhalation powder DSB A G</p>	<p><b>Breo® Ellipta®</b> 100/25, 200/25 mcg fluticasone furoate and vilanterol inhalation powder DSB A C G</p>	<p><b>Dulera®</b> 50/5, 100/5, 200/5 mcg mometasone furoate and formoterol fumarate dihydrate DSB A</p>	<p><b>Symbicort®</b> 80/4.5, 160/4.5 mcg budesonide and formoterol fumarate dihydrate DSB A C G</p>	<p><b>Wixela™ Inhub™</b> 100/50, 250/50, 500/50 mcg fluticasone propionate and aclidinium xinafoate (available only in the United States) DSB A C G</p>	<p><b>Urorespi® Ellipta®</b> 5/25 mcg umecidinium and arbutol inhalation powder DSB C</p>	<p><b>Bevespi® Aerosphere®</b> 8/4.8 mcg glycopyrrolate and formoterol fumarate DSB C</p>	<p><b>Duaklir® Pressair®</b> 400, 12 mcg aclidinium bromide and formoterol fumarate DSB C</p>	<p><b>Stiolto® RespiMat®</b> 2.5/2.5 mcg tiotropium bromide and olodaterol DSB C</p>	<p><b>Trelegy® Ellipta®</b> 300/62.5/25 mcg, 180/62.5/25 mcg fluticasone furoate, umecidinium and vilanterol inhalation powder DSB A C</p>	<p><b>Breztri® Aerosphere™</b> 180/9/4.8 mcg budesonide, glycopyrrolate and formoterol fumarate C</p>
---	--	--	---	--	---	---	---	---	---	---	--	--	---

## BIOLOGICS

target cells and pathways that cause airway inflammation; delivered by injection or IV

<p><b>Cinqair®</b> reslizumab A</p>	<p><b>Dupixent®</b> dupilumab A</p>	<p><b>Fasenra™</b> benralizumab A</p>	<p><b>Nucala®</b> mepolizumab A</p>	<p><b>Xolair®</b> omalizumab A</p>
---	---	---	---	--

## BRONCHIAL THERMOPLASTY

A minimally invasive procedure that uses mild heat to reduce airway smooth muscle, leading to fewer severe asthma flares, ER visits, and days lost from activities.  
www.bforasthma.com  
A

## PDE4 INHIBITORS

ease lung inflammation and reduce exacerbations

**Daliresp®**  
250, 500 mcg roflumilast  
G

# COPD: Part 1

We have three categories of medications

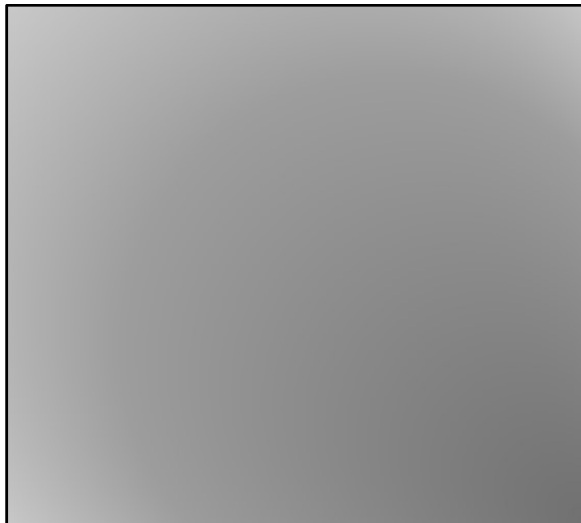


## **SAMA/LAMA**

Short – SAMA

Long – LAMA

Anticholinergic and  
constriction  
prevention



# **COPD Medication Categories: SAMA/LAMA**

Ipratropium bromide (and other short and long-acting muscarinic antagonists) are often listed as bronchodilators?

Are they? They exert minimal direct effect on smooth muscle. . . .

# COPD Medication Categories: SAMA/LAMA

Ipratropium bromide

1. Made from the combination of Isopropyl alcohol and atropine. The name comes from these two words. Isopropyl alcohol and atropine
2. Works by INCREASING the degradation of cGMP and by DECREASING  $Ca^{2+}$  in the cells, thus blocking contraction. They don't dilate anything really.
3. Onset of action . . . 20 minutes or so.  
Ipratropium half life is 2 hours.

# **COPD Medication Categories: SAMA/LAMA**

Why use short and long-acting beta agonists if they block constriction – but in COPD you don't really have constriction?

These help block contraction but also reduce RESTING TONE.

So even if not overly constricted, can be helpful.

Minimal systemic absorption

## SHORT-ACTING BETA<sub>2</sub>-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

<p><b>ProAir® Digihaler™</b> 90 mcg albuterol sulfate inhalation powder D5B A</p>	<p><b>ProAir® HFA</b> 90 mcg albuterol sulfate D5B A G</p>	<p><b>ProAir® RespiClick®</b> 90 mcg albuterol sulfate inhalation powder D5B A</p>	<p><b>Proventil® HFA</b> 90 mcg albuterol sulfate D5B A G</p>	<p><b>Ventolin® HFA</b> 90 mcg albuterol sulfate D5B A G</p>	<p><b>Xopenex HFA</b> 45 mcg levalbuterol tartrate A G</p>
---	--	--	---	--	--

## LONG-ACTING BETA<sub>2</sub>-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer lasting relief of symptoms such as coughing, wheezing and shortness of breath for at least 12 hours

<p><b>Serevent® Diskus®</b> 50 mcg salmeterol xinafoate inhalation powder D5B A C</p>	<p><b>Striverdi® RespiMat®</b> 2.5 mcg olodaterol hydrochloride D5B C</p>
---	---

## INHALED CORTICOSTEROIDS

reduce and prevent swelling of airway tissue; they do not relieve sudden symptoms of coughing, wheezing or shortness of breath

<p><b>Alvesco® HFA</b> 80, 160 mcg ciclesonide D5B A</p>	<p><b>ArmonAir® Digihaler™</b> 55, 113, 232 mcg fluticasone propionate inhalation powder D5B A</p>	<p><b>Arnuity® Ellipta®</b> 50, 100, 200 mcg fluticasone furoate inhalation powder D5B A</p>	<p><b>Asmanex® HFA</b> 50, 100, 200 mcg mometasone furoate D5B A</p>	<p><b>Asmanex® Twisthaler®</b> 110, 220 mcg mometasone furoate inhalation powder D5B A</p>	<p><b>Flovent® Diskus®</b> 50, 100, 250 mcg fluticasone propionate inhalation powder D5B A</p>	<p><b>Flovent® HFA</b> 44, 110, 220 mcg fluticasone propionate D5B A</p>	<p><b>Pulmicort Flexhaler®</b> 90, 180 mcg budesonide inhalation powder D5B A</p>	<p><b>QVAR® Redihaler™</b> 40, 80 mcg beclomethasone dipropionate D5B A</p>
--	--	--	--	--	--	--	---	---

## MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)

relieve cough, sputum production, wheeze and chest tightness associated with chronic lung diseases

<p><b>Short-acting</b></p> <p><b>Atrovent® HFA</b> 17 mcg ipratropium bromide D5B C</p>	<p><b>Long-acting</b></p> <p><b>Incruse® Ellipta®</b> 62.5 mcg umecidinium inhalation powder D5B C</p>	<p><b>Spiriva® HandiHaler®</b> 18 mcg tiotropium bromide inhalation powder C</p>	<p><b>Spiriva® RespiMat®</b> 1.25, 2.5 mcg tiotropium bromide D5B A C</p>	<p><b>Tudorza™ Pressair™</b> 400 mcg aclidinium bromide inhalation powder D5B C</p>
---	--	--	---	---

## COMBINATION MEDICATIONS

contain both short-acting beta<sub>2</sub>-agonist and short-acting muscarinic antagonist

<p><b>Combivent® RespiMat®</b> 20/100 mcg ipratropium bromide and albuterol D5B C</p>
---

## COMBINATION MEDICATIONS

contain both long-acting beta<sub>2</sub>-agonist and inhaled corticosteroid, long-acting beta<sub>2</sub>-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

<p><b>Advair® HFA</b> 45/21, 115/21, 230/21 mcg fluticasone propionate and salmeterol xinafoate D5B A G</p>	<p><b>Advair® Diskus®</b> 100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol xinafoate D5B A C G</p>	<p><b>AirDuo® Digihaler™</b> 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol xinafoate inhalation powder A</p>	<p><b>AirDuo® RespiClick®</b> 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol xinafoate inhalation powder D5B A G</p>	<p><b>Breo® Ellipta®</b> 100/25, 200/25 mcg fluticasone furoate and vilanterol inhalation powder D5B A C G</p>	<p><b>Dulera®</b> 50/5, 100/5, 200/5 mcg mometasone furoate and formoterol fumarate dihydrate D5B A</p>	<p><b>Symbicort®</b> 80/4.5, 160/4.5 mcg budesonide and formoterol fumarate dihydrate D5B A C G</p>	<p><b>Wixela™ Inhub™</b> 100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol xinafoate (sister product of Advair Diskus) D5B A C G</p>	<p><b>Anoro® Ellipta®</b> 62.5/25 mcg umecidinium and vilanterol inhalation powder D5B C</p>	<p><b>Bevespi Aerosphere®</b> 8/4.8 mcg glycopyrrolate and formoterol fumarate D5B C</p>	<p><b>Duaklir® Pressair®</b> 400, 12 mcg aclidinium bromide and formoterol fumarate D5B C</p>	<p><b>Stiolto® RespiMat®</b> 2.5/2.5 mcg tiotropium bromide and olodaterol D5B C</p>	<p><b>Trelegy® Ellipta®</b> 200/62.5/25 mcg, 100/62.5/25 mcg budesonide, fluticasone furoate, and vilanterol inhalation powder D5B A C</p>	<p><b>Breztri Aerosphere™</b> 180/9/4.8 mcg budesonide, glycopyrrolate and formoterol fumarate C</p>
---	--	--	---	--	---	---	---	--	--	---	--	--	--

## BIOLOGICS

target cells and pathways that cause airway inflammation; delivered by injection or IV

<p><b>Cinqair®</b> reslizumab A</p>	<p><b>Dupixent®</b> dupilumab A</p>	<p><b>Fasenra™</b> benralizumab A</p>	<p><b>Nucala®</b> mepolizumab A</p>	<p><b>Xolair®</b> omalizumab A</p>
---	---	---	---	--

## BRONCHIAL THERMOPLASTY

A minimally invasive procedure that uses mild heat to reduce airway smooth muscle, leading to fewer severe asthma flares, ER visits, and days lost from activities.  
www.bforasthma.com  
A



## PDE4 INHIBITORS

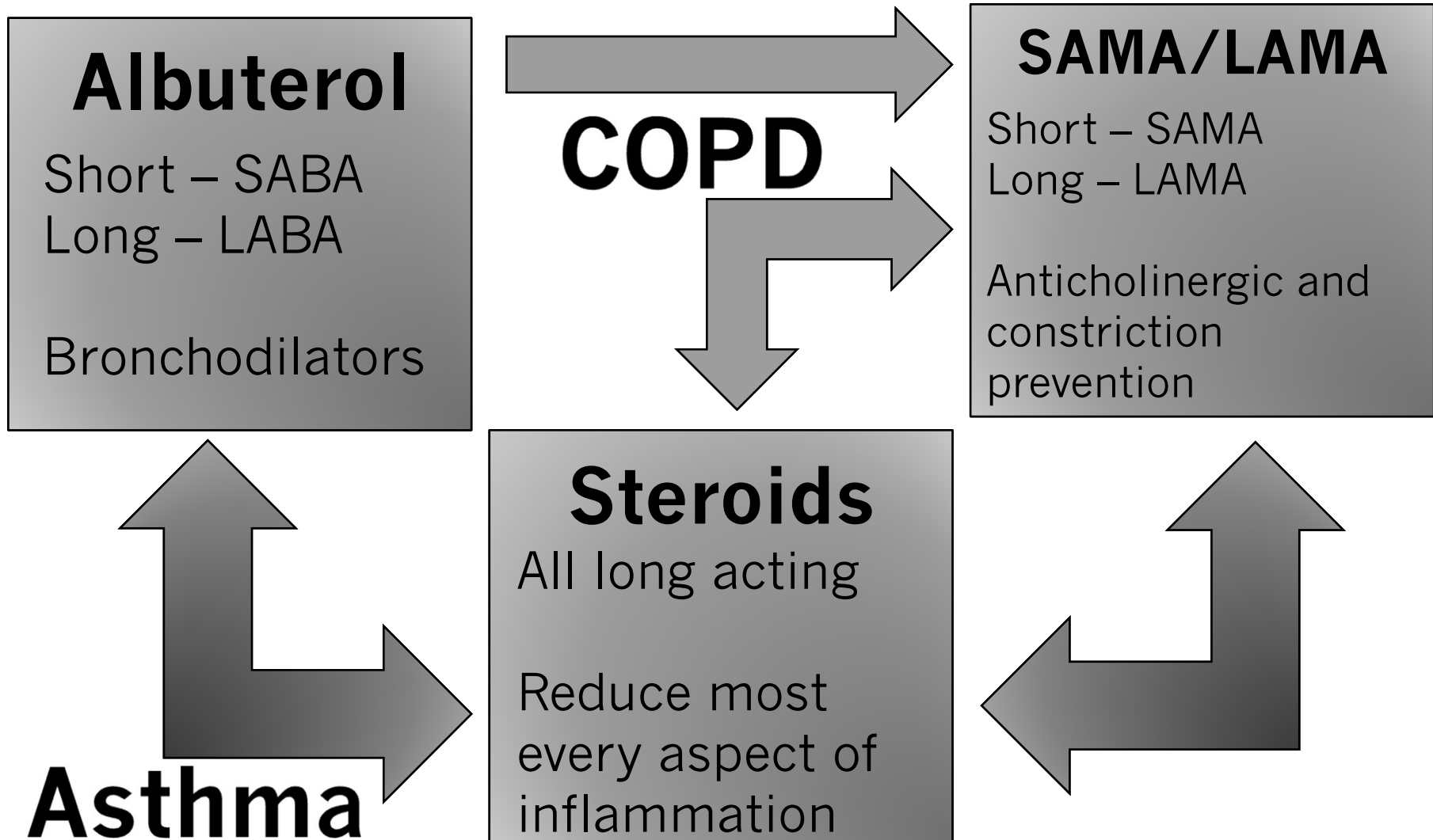
ease lung inflammation and reduce exacerbations

<p><b>Daliresp®</b> 250, 500 mcg roflumilast G</p>
--



# COPD: Part 2

We have three categories of medications



# COPD MEDICATIONS

## Short-Acting Bronchodilators

### SAMA

(Short-Acting Muscarinic Antagonist)  
USE REGULARLY or PRN



**Atrovent® MDI**  
(ipratropium bromide)  
20 mcg/dose

Duration: 4-6h  
Company: BI  
\*nebulas also available

### SABA

(Short-Acting Beta2-Agonist)  
USE REGULARLY or PRN



**Airomir™ MDI**  
(salbutamol sulphate)  
100 mcg/dose

Duration: 4-6h  
Company: Valeant



**Bricanyl® Turbuhaler®**  
(terbutaline sulphate)  
0.5 mg/dose

Duration: 4-6h  
Company: AZ



**Ventolin® Diskus®**  
(salbutamol sulphate)  
200 mcg/dose

Duration: 4-6h  
Company: GSK



**Ventolin® MDI**  
(salbutamol sulphate)  
100 mcg/dose

Duration: 4-6h  
Company: GSK  
\*nebulas and generic brands available

#### Company Key

AZ – AstraZeneca Canada Inc.  
BI – Boehringer Ingelheim Canada Ltd.  
GSK – GlaxoSmithKline Inc.  
Novartis – Novartis Pharmaceuticals Canada Inc.  
Valeant – Valeant Canada  
Viartis – Viartis

Permission is granted to copy the document as is.  
Images in this document are copyrighted and may not be reproduced.

## Long-Acting Bronchodilators

### LAMA

(Long-Acting Muscarinic Antagonist)  
USE REGULARLY



**Incruse™ Ellipta®**  
(umeclidinium bromide)  
62.5 mcg/dose

Duration: 24h  
Company: GSK



**Seebri® Breezhaler®**  
(glycopyrronium bromide)  
50 mcg/dose

Duration: 24h  
Company: Novartis



**Spiriva® Handihaler®**  
(tiotropium bromide monohydrate)  
18 mcg/dose

Duration: 24h  
Company: BI



**Spiriva® Respimat®**  
(tiotropium bromide monohydrate)  
2.5 mcg/dose

Duration: 24h  
Company: BI



**Tudorza® Genuair®**  
(aclidinium bromide)  
400 mcg/dose

Duration: 12h  
Company: AZ

### LABA

(Long-Acting Beta2-Agonist)  
USE REGULARLY



**Foradil® Aerolizer®**  
(formoterol fumarate)  
12 mcg/dose

Duration: 12h  
Company: Novartis



**Onbrez® Breezhaler®**  
(indacaterol maleate)  
75 mcg/dose

Duration: 24h  
Company: Novartis



**Serevent® Diskus®**  
(salmeterol xinafoate)  
50 mcg/dose

Duration: 12h  
Company: GSK



**Striverdi® Respimat®**  
(olodaterol hydrochloride)  
2.5 mcg/dose

Duration: 24h  
Company: BI  
\*Approved by Health Canada but may not be available yet



**Breztri™ Aerosphere®**  
(budesonide/glycopyrronium/formoterol fumarate)  
182/8.2/5.8 mcg/dose

Duration: 12h  
Company: AZ

## Combination Inhalers

### ICS/LABA

(Inhaled Corticosteroid/Long-Acting Beta2-Agonist)  
USE REGULARLY



**Advair® Diskus®**  
(fluticasone propionate/salmeterol xinafoate)  
100/50; 250/50;  
500/50 mcg doses

Duration: 12h  
Company: GSK



**Breo™ Ellipta®**  
(fluticasone furoate/vilanterol trifenate)  
100/25 mcg/dose

Duration: 24h  
Company: GSK



**Symbicort® Turbuhaler®**  
(budesonide/formoterol fumarate)  
100/6; 200/6; 400/12  
FORTE mcg doses

Duration: 12h  
Company: AZ



**Wixela® Inhub®**  
(fluticasone propionate/salmeterol xinafoate)  
100/50; 250/50;  
500/50 mcg doses

Duration: 12h  
Company: Viartis



**Trelegy™ Ellipta®**  
(fluticasone furoate/umeclidinium bromide/vilanterol trifenate)  
100/62.5/25 mcg/dose

Duration: 24h  
Company: GSK

### SAMA and SABA

USE REGULARLY



**Combivent® Respimat®**  
(ipratropium bromide/salbutamol sulphate)  
20/100 mcg/dose

Duration: 4-6h  
Company: BI  
\*nebulas also available

### LAMA and LABA

USE REGULARLY



**Anoro™ Ellipta®**  
(umeclidinium bromide/vilanterol trifenate)  
62.5/25 mcg/dose

Duration: 24h  
Company: GSK



**Duaklir® Genuair®**  
(aclidinium bromide/formoterol fumarate dehydrate)  
400/12 mcg/dose

Duration: 12h  
Company: AZ



**Inspolto® Respimat®**  
(tiotropium bromide monohydrate/olodaterol hydrochloride)  
2.5/2.5 mcg dose

Duration: 24h  
Company: BI



**Ultibro® Breezhaler®**  
(glycopyrronium bromide/indacaterol maleate)  
50/110 mcg/dose

Duration: 24h  
Company: Novartis

### ICS/LAMA/LABA USE REGULARLY

## ▶ BRONCHODILATORS IN STABLE COPD

- Inhaled bronchodilators in COPD are central to symptom management and commonly given on a regular basis to prevent or reduce symptoms (**Evidence A**).
- Regular and as-needed use of SABA or SAMA improves FEV<sub>1</sub> and symptoms (**Evidence A**).
- Combinations of SABA and SAMA are superior compared to either medication alone in improving FEV<sub>1</sub> and symptoms (**Evidence A**).
- LABAs and LAMAs significantly improve lung function, dyspnea, health status, and reduce exacerbation rates (**Evidence A**).
- LAMAs have a greater effect on exacerbation reduction compared with LABAs (**Evidence A**) and decrease hospitalizations (**Evidence B**).
- Combination treatment with a LABA and LAMA increases FEV<sub>1</sub> and reduces symptoms compared to monotherapy (**Evidence A**).
- Combination treatment with a LABA/LAMA reduces exacerbations compared to monotherapy (**Evidence B**).
- Tiotropium improves the effectiveness of pulmonary rehabilitation in increasing exercise performance (**Evidence B**).
- Theophylline exerts a small bronchodilator effect in stable COPD (**Evidence A**) and that is associated with modest symptomatic benefits (**Evidence B**).

- LABAs and LAMAs significantly improve lung function, dyspnea, health status, and reduce exacerbation rates (**Evidence A**).

- LAMAs have a greater effect on exacerbation reduction compared with LABAs (**Evidence A**) and decrease hospitalizations (**Evidence B**).
- Combination treatment with a LABA and LAMA increases FEV<sub>1</sub> and reduces symptoms compared to monotherapy (**Evidence A**).

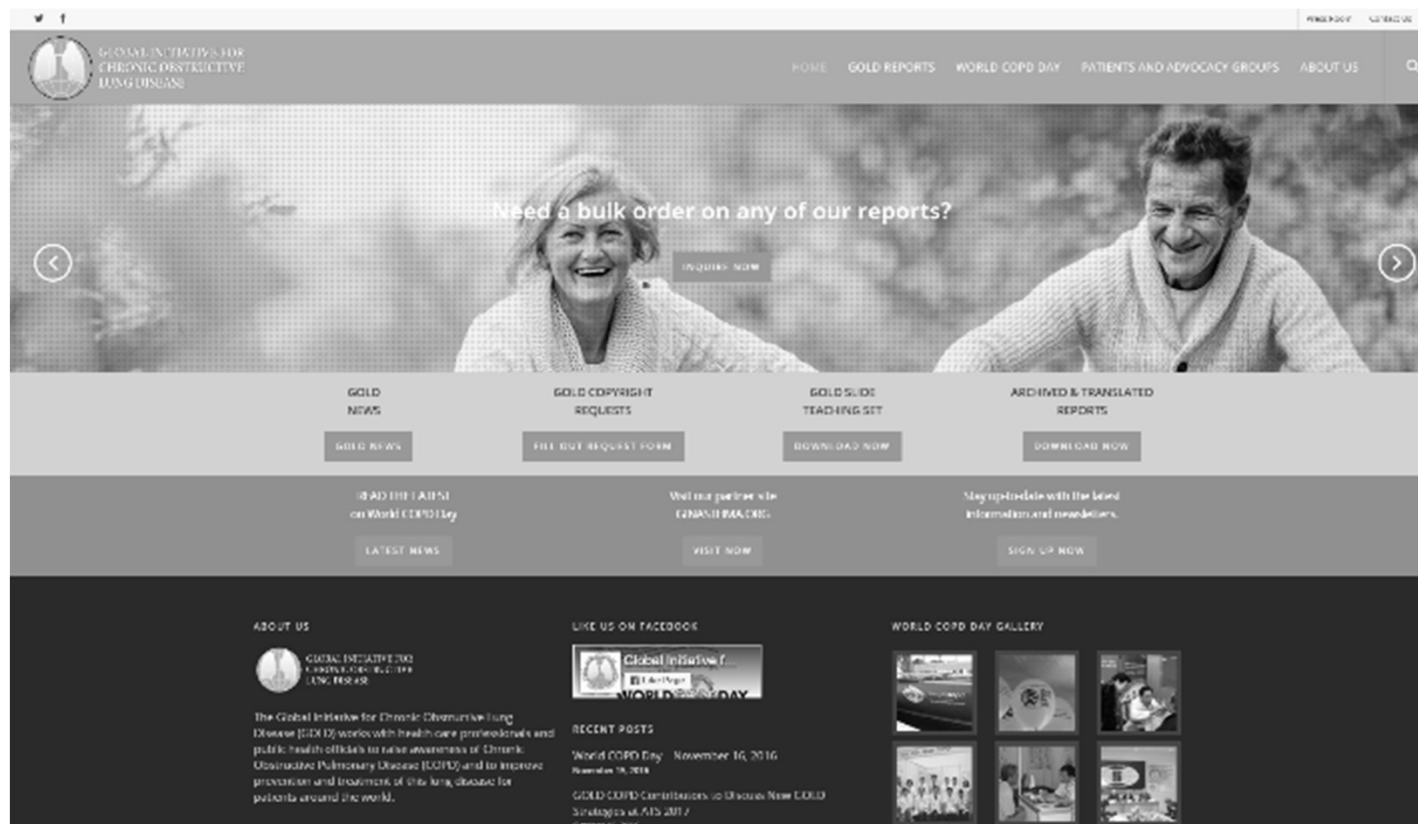


## GLOBAL INITIATIVE FOR CHRONIC OBSTRUCTIVE LUNG DISEASE (GOLD):



## GOLD Website Address

# www.goldcopd.org



# COPD Defined

‘A **common preventable** and treatable disease, is characterized by persistent 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 individual patients.’

# COPD Defined

- Chronic bronchitis: chronic productive cough for 3 months in each of two successive years (other causes excluded)

Emphysema: abnormal and permanent enlargement of the airspaces distal to the terminal bronchioles that is accompanied by destruction of the airspace walls



# Clinical Indicators for Considering a Diagnosis of COPD

**Consider the diagnosis of COPD, and perform spirometry, if any of these clinical indicators are present:**  
(these indicators are not diagnostic themselves, but the presence of multiple key indicators increases the probability of the presence of COPD; in any case, spirometry is required to establish a diagnosis of COPD)

## Dyspnea that is

Progressive over time  
Worse with exercise  
Persistent

## Recurrent wheeze

## Chronic cough

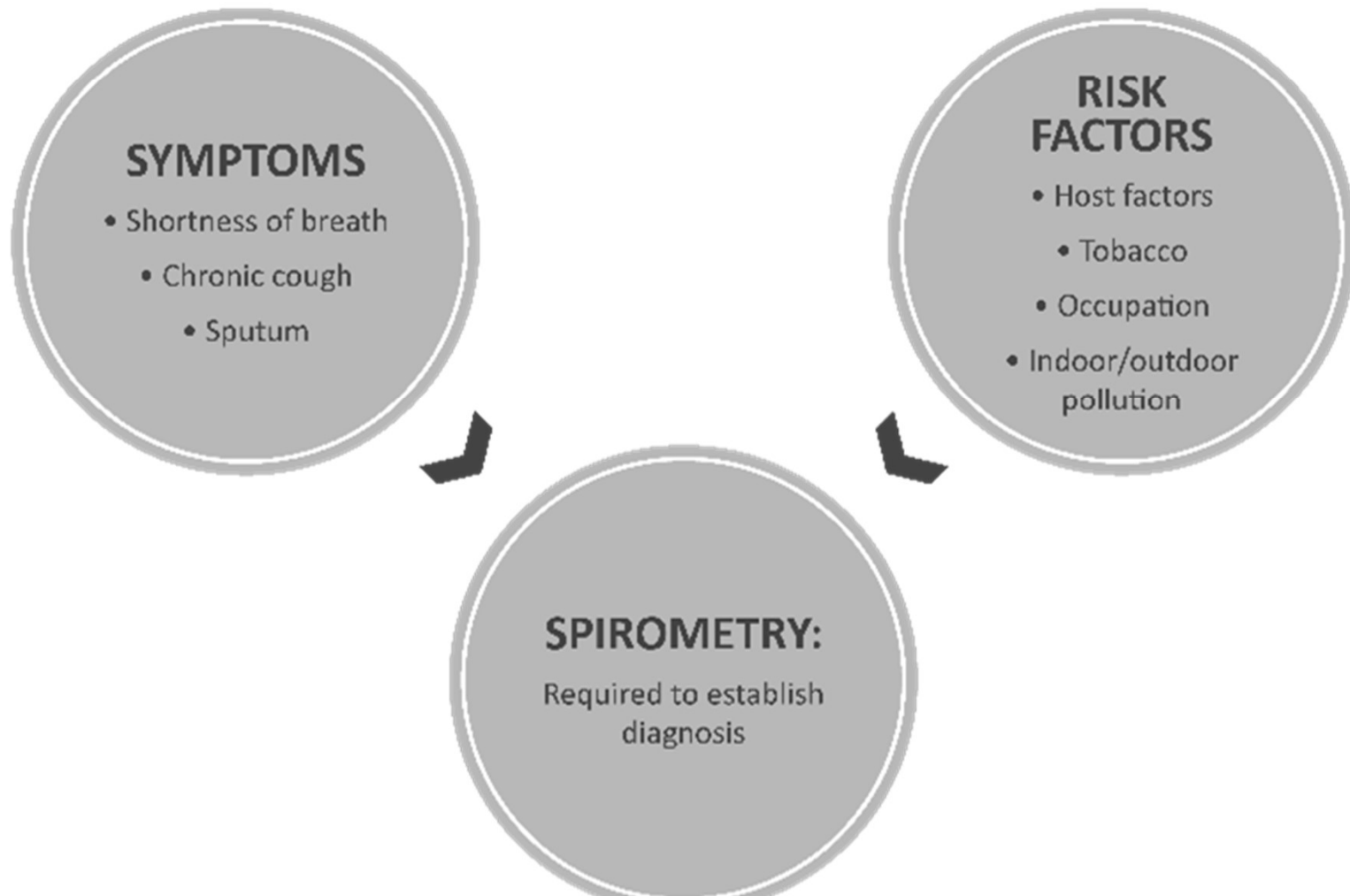
May be intermittent and may be unproductive

## Recurrent lower respiratory tract infections

## History of risk factors

Tobacco smoke (including popular local preparations)  
Smoke from home cooking and heating fuels  
Occupational dusts, vapors, fumes, gases and other chemicals  
Host factors (e.g., genetic factors, developmental abnormalities, low birthweight, prematurity, childhood respiratory infections etc.)

## ▶ PATHWAYS TO THE DIAGNOSIS OF COPD



# COPD Diagnosis and Treatment

In a patient with the right history and symptoms (or a previous assumed dx of COPD) get the testing done.

## Role of Spirometry in COPD

- **Diagnosis**
- **Assessment of severity of airflow obstruction (for prognosis)**
- **Follow-up assessment**
  - Therapeutic decisions
    - Pharmacological in selected circumstances (e.g., discrepancy between spirometry and level of symptoms)
    - Consider alternative diagnoses when symptoms are disproportionate to degree of airflow obstruction
    - Non-pharmacological (e.g., interventional procedures)
  - Identification of rapid decline

**CLASSIFICATION OF AIRFLOW LIMITATION SEVERITY  
IN COPD (BASED ON POST-BRONCHODILATOR FEV<sub>1</sub>)**

**In patients with FEV<sub>1</sub>/FVC < 0.70:**

<b>GOLD 1:</b>	Mild	FEV <sub>1</sub> ≥ 80% predicted
<b>GOLD 2:</b>	Moderate	50% ≤ FEV <sub>1</sub> < 80% predicted
<b>GOLD 3:</b>	Severe	30% ≤ FEV <sub>1</sub> < 50% predicted
<b>GOLD 4:</b>	Very Severe	FEV <sub>1</sub> < 30% predicted



In patients with  $FEV_1/FVC < 0.70$ :

This is comparing the patient to themselves



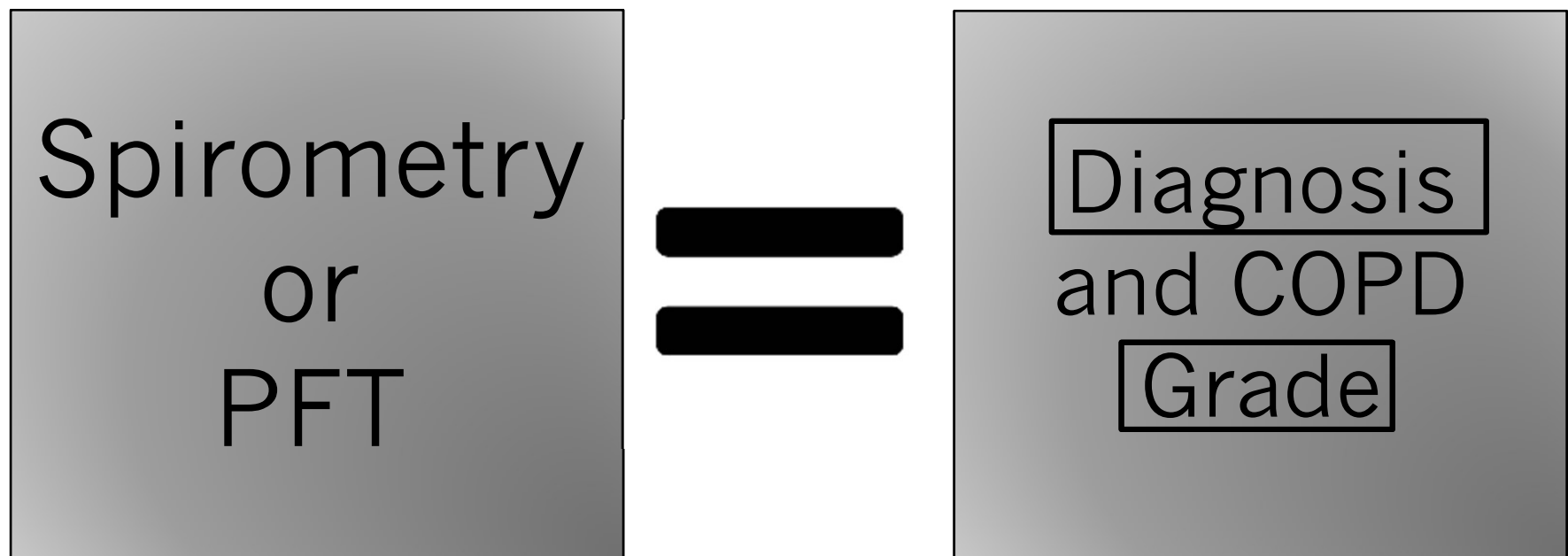
## CLASSIFICATION OF AIRFLOW LIMITATION SEVERITY IN COPD (BASED ON POST-BRONCHODILATOR FEV<sub>1</sub>)

In patients with FEV<sub>1</sub>/FVC < 0.70:

<b>GOLD 1:</b>	Mild	FEV <sub>1</sub> ≥ 80% predicted
<b>GOLD 2:</b>	Moderate	50% ≤ FEV <sub>1</sub> < 80% predicted
<b>GOLD 3:</b>	Severe	30% ≤ FEV <sub>1</sub> < 50% predicted
<b>GOLD 4:</b>	Very Severe	FEV <sub>1</sub> < 30% predicted

This is comparing the patient to a peer based on height, weight, age, gender and ethnicity.

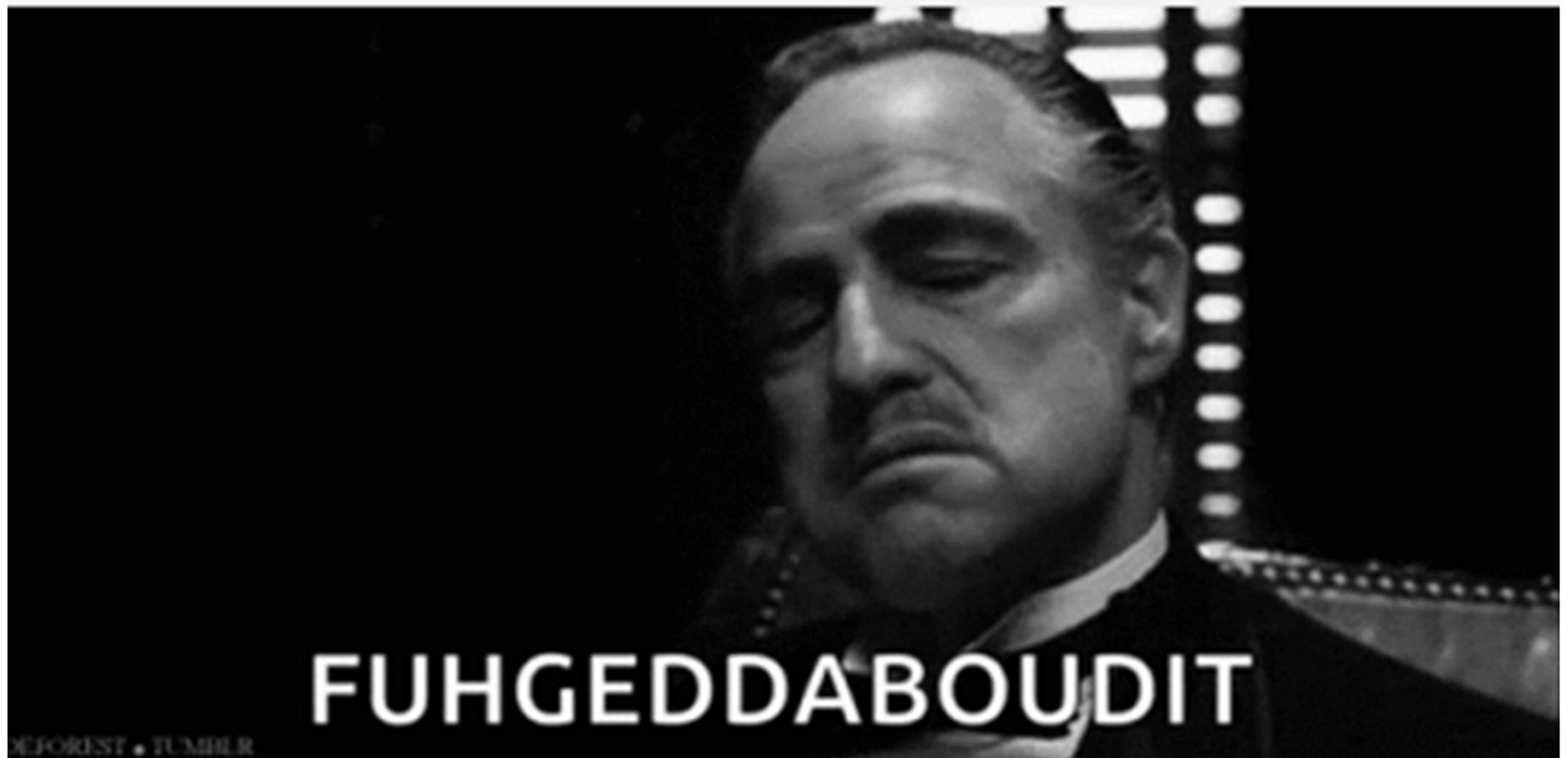
# COPD Diagnosis and Treatment



So do this once,  
then, the good news . . .



# COPD Diagnosis and Treatment



# COPD Diagnosis and Treatment

Spirometry  
or  
PFT



Category  
or  
Treatment

▶ CLASSIFICATION OF AIRFLOW LIMITATION SEVERITY  
IN COPD (BASED ON POST-BRONCHODILATOR FEV<sub>1</sub>)

In patients with FEV<sub>1</sub>/FVC < 0.70:

<b>GOLD 1:</b>	Mild	FEV <sub>1</sub> ≥ 80% predicted
<b>GOLD 2:</b>	Moderate	50% ≤ FEV <sub>1</sub> < 80% predicted
<b>GOLD 3:</b>	Severe	30% ≤ FEV <sub>1</sub> < 50% predicted
<b>GOLD 4:</b>	Very Severe	FEV <sub>1</sub> < 30% predicted

Set this aside and ask  
them how they are  
doing

▶ CLASSIFICATION OF AIRFLOW LIMITATION SEVERITY  
IN COPD (BASED ON POST-BRONCHODILATOR FEV<sub>1</sub>) ▶

In patients with FEV<sub>1</sub>/FVC < 0.70:

GOLD 1:	Mild	FEV <sub>1</sub> ≥ 80% predicted
GOLD 2:	Moderate	50% ≤ FEV <sub>1</sub> < 80% predicted
GOLD 3:	Severe	30% ≤ FEV <sub>1</sub> < 50% predicted
GOLD 4:	Very Severe	FEV <sub>1</sub> < 30% predicted

Just like with asthma, every visit needs to start with an assessment of symptoms, exacerbations and overall condition

**BEFORE YOU ENTER**

# CAT™ ASSESSMENT

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	0	1	2	3	4	5	I am very sad	SCORE
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 completely 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	_____

Reference: Jones et al. ERJ 2009; 34 (3); 648-54.

TOTAL SCORE:

## ▶ MODIFIED MRC DYSPNEA SCALE<sup>a</sup>

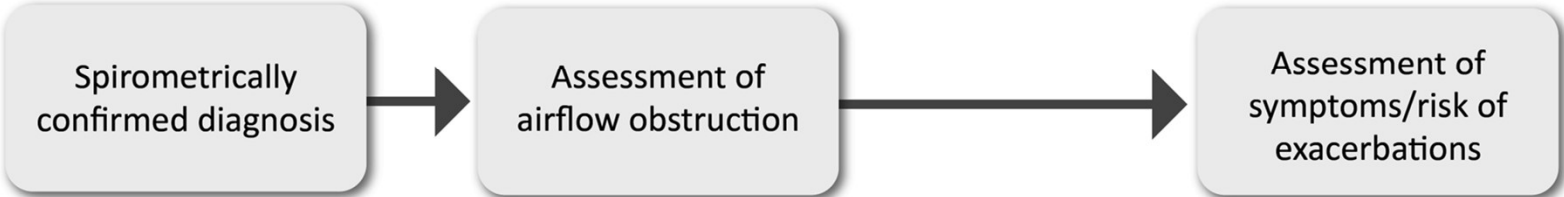
PLEASE TICK IN THE BOX THAT APPLIES TO YOU | ONE BOX ONLY | Grades 0 - 4

<b>mMRC Grade 0.</b>	I only get breathless with strenuous exercise.	<input type="checkbox"/>
<b>mMRC Grade 1.</b>	I get short of breath when hurrying on the level or walking up a slight hill.	<input type="checkbox"/>
<b>mMRC Grade 2.</b>	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.	<input type="checkbox"/>
<b>mMRC Grade 3.</b>	I stop for breath after walking about 100 meters or after a few minutes on the level.	<input type="checkbox"/>
<b>mMRC Grade 4.</b>	I am too breathless to leave the house or I am breathless when dressing or undressing.	<input type="checkbox"/>

# Single Question Symptom Check

Can you walk at a reasonable  
pace on level ground without  
stopping to catch your breath?

# GOLD ABE Assessment Tool



Post-bronchodilator  
FEV1/FVC < 0.7

GRADE	FEV1 (% predicted)
<b>GOLD 1</b>	≥ 80
<b>GOLD 2</b>	50-79
<b>GOLD 3</b>	30-49
<b>GOLD 4</b>	< 30

EXACERBATION HISTORY
≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization
0 or 1 moderate exacerbations (not leading to hospitalization)

<b>E</b>	
<b>A</b>	<b>B</b>

mMRC 0-1 CAT < 10	mMRC ≥ 2 CAT ≥ 10
----------------------	----------------------

**SYMPTOMS**



0 or 1 moderate  
exacerbations  
(not leading to  
hospital admission)

**GROUP A**

**A bronchodilator**

mMRC 0-1, CAT < 10

0 or 1 moderate  
exacerbations  
(not leading to  
hospital admission)

**GROUP B**

**LABA + LAMA\***

mMRC  $\geq$  2, CAT  $\geq$  10

≥ 2 moderate  
exacerbations or  
≥ 1 leading to  
hospitalization

**GROUP E**

**LABA + LAMA\***

*consider LABA+LAMA+ICS\* if blood eos ≥ 300*

mMRC 0-1, CAT < 10

mMRC ≥ 2, CAT ≥ 10

# Initial Pharmacological Treatment

Figure 4.2



\*single inhaler therapy may be more convenient and effective than multiple inhalers

# Inhaled Steroids (ICS) –

If not needed don't use them!

Increased risk of all URIs and increased risk of pneumonia and exacerbations

Fluticasone is the worst

GROUP E

**LABA + LAMA\***

*consider LABA+LAMA+ICS\* if blood eos  $\geq$  300*

Meta-Analysis > Int Immunopharmacol. 2019 Dec;77:105950. doi: 10.1016/j.intimp.2019.105950. Epub 2019 Oct 17.

## Inhaled corticosteroids and risk of pneumonia in patients with chronic obstructive pulmonary disease: A meta-analysis of randomized controlled trials

Mingjin Yang<sup>1</sup>, Yuejun Du<sup>1</sup>, Hong Chen<sup>1</sup>, Depeng Jiang<sup>2</sup>, Zhibo Xu<sup>3</sup>

Affiliations + expand

PMID: 31629940 DOI: 10.1016/j.intimp.2019.105950

### Abstract

**Objective:** Inhaled corticosteroids (ICS) are generally used to treat patients with chronic obstructive pulmonary disease (COPD) who suffer from repeated exacerbations. Recently, it was reported that ICS treatment increased the risk of pneumonia in COPD patients. But it is controversial. The objective of this paper is to clarify the associations between ICS treatment and the risk of pneumonia in COPD patients.

**Methods:** PubMed, Cochrane Library, Clinical Trials.gov, and Embase were searched from February 2019 to June 2019. Randomized clinical trials (RCTs) were incorporated that compared ICS with non-ICS treatment on the risk of pneumonia in COPD patients. Meta-analyses were conducted by the Peto and Mantel-Haenszel approaches with corresponding 95% CIs.

**Results:** Twenty-five trials (N = 49,982 subjects) were included. Pooled results demonstrated a significantly increased risk of pneumonia with ICS use in COPD patients (RR, 1.59, 95% CI, 1.33-1.90;  $I^2$  = 51%). ICS treatment also increased the risk of severe pneumonia (RR, 2.17, 95% CI, 1.47-3.22;  $I^2$  = 29%). The results of subgroup analysis based on doses of ICS were consistent with the above. However, subgroup analyses based on types of ICS revealed that fluticasone therapy was associated with an increased risk of pneumonia but not budesonide. In addition, medium- and low-doses of budesonide treatment also did not increase the risk of pneumonia.

**Conclusions:** Use of ICS increases the risk of pneumonia in patients with COPD. The above is prominent for fluticasone-containing ICSs but not for budesonide-containing ICSs.



GROUP E

**LABA + LAMA\***

*consider LABA+LAMA+ICS\* if blood eos  $\geq$  300*

Inhaled Steroids (ICS) – more likely to help:  
Allergic or asthma history  
Eosinophils over 300 cells/ $\mu$ l  
History of benefit

Can always do a steroid challenge, a good idea really, 40 mg PO for 7 days and see how they respond

# Factors to Consider when Initiating ICS Treatment

## Factors to consider when adding ICS to long-acting bronchodilators:

(note the scenario is different when considering ICS withdrawal)

### STRONGLY FAVORS USE

History of hospitalization(s) for exacerbations of COPD<sup>#</sup>

≥ 2 moderate exacerbations of COPD per year<sup>#</sup>

Blood eosinophils ≥ 300 cells/μL

History of, or concomitant asthma

### FAVORS USE

1 moderate exacerbation of COPD per year<sup>#</sup>

Blood eosinophils 100 to < 300 cells/μL

### AGAINST USE

Repeated pneumonia events

Blood eosinophils < 100 cells/μL

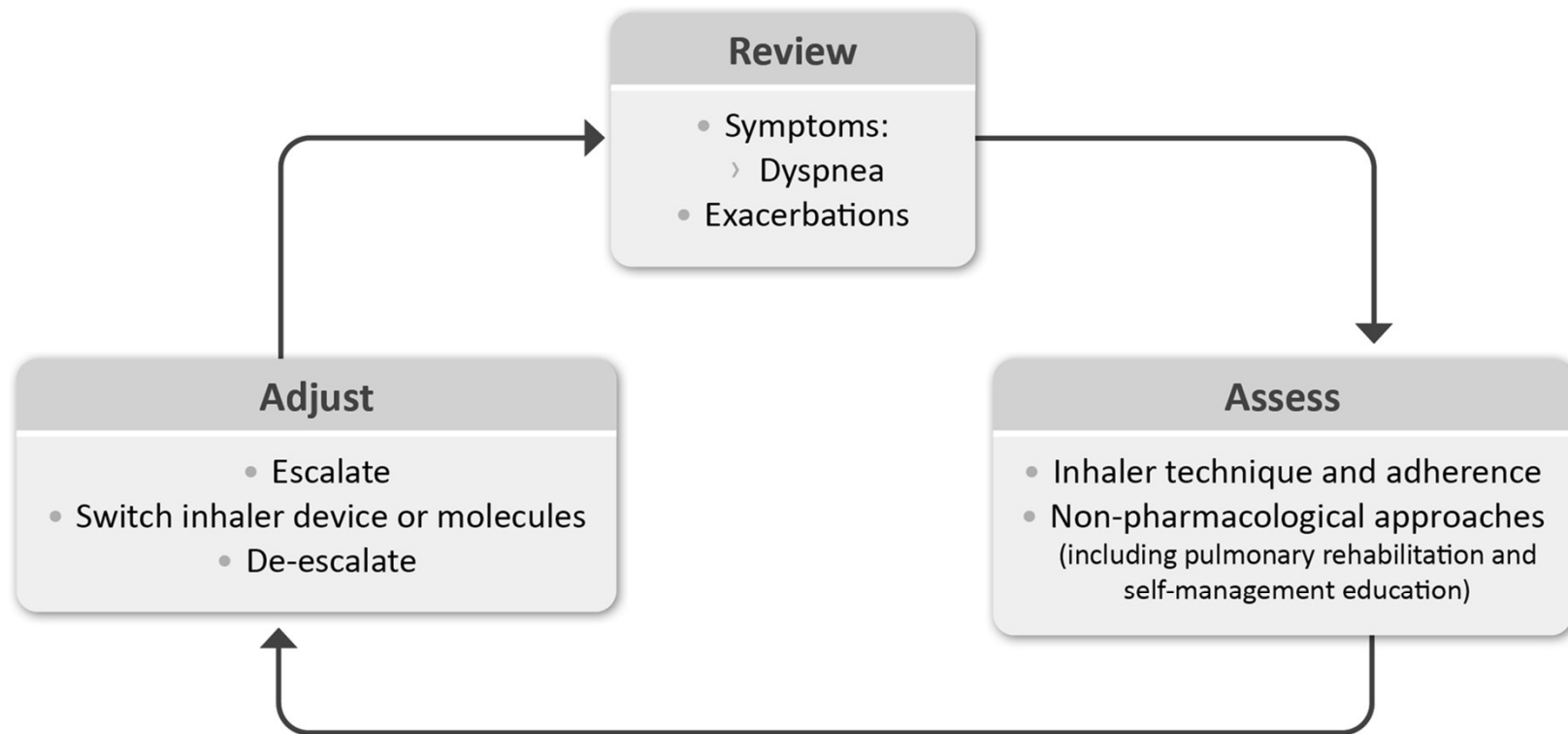
History of mycobacterial infection

<sup>#</sup>despite appropriate long-acting bronchodilator maintenance therapy (see Table 3.4 and Figure 4.3 for recommendations);

\*note that blood eosinophils should be seen as a continuum; quoted values represent approximate cut-points; eosinophil counts are likely to fluctuate.

Adapted from & reproduced with permission of the © ERS 2019: *European Respiratory Journal* 52 (6) 1801219; DOI: 10.1183/13993003.01219-2018 Published 13 December 2018

# Management Cycle





# COPD Best Practices

Diagnose with Spirometry or PFT

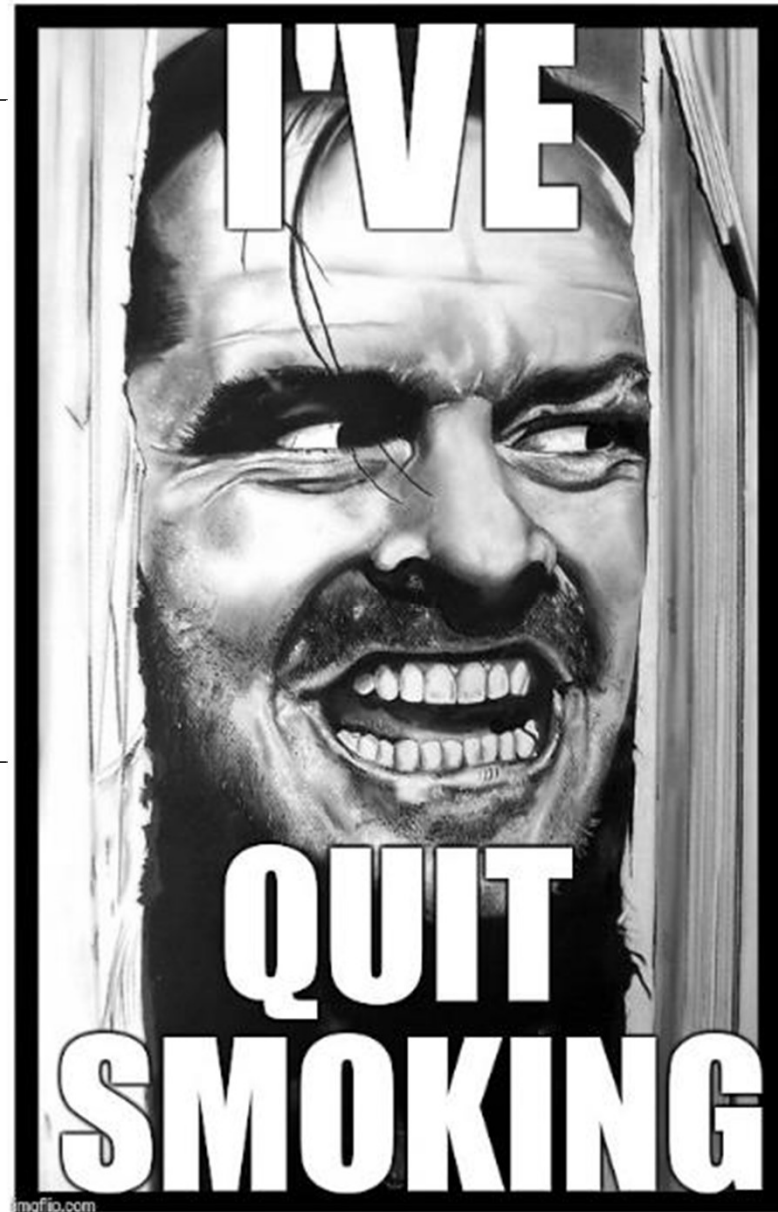
Once this is done set aside the numbers and focus on symptoms and exacerbations/hospitalizations

Use the CAT and figure out what category (A-D) and corresponding medication type, make changes

Questions on this so far?

# COPD Best Practices

Smoking Cessation



[<< Previous article](#)

Mar 15, 2021 Issue

[Next article >>](#)

Practice Guidelines

## Medications for Smoking Cessation: Guidelines from the American Thoracic Society



PRINT



COMMENTS

*Am Fam Physician.* 2021 Mar 15;103(6):380-381.

**Author disclosure:** No relevant financial affiliations.

### Key Points for Practice

- Varenicline is more effective than nicotine patches and bupropion with similar or fewer adverse events, even with comorbid psychiatric or substance abuse conditions.
- Combining varenicline with nicotine patches appears to be more effective than using varenicline alone based on limited evidence.
- For people who smoke and are not ready to quit, prescribing varenicline increases six-month abstinence with an NNT of 6 compared with waiting for readiness.
- Extending treatment beyond 12 weeks increases abstinence, with an NNT of 19 compared with shorter treatment durations.

From the *AFP* Editors

**STARTING WEEK**  
(0.5 mg\* x 11 tablets)

MORNING

Day 1 

Day 2 

Day 3 

Day 4 

Day 5 

Day 6 

Day 7 

NO TABLET HERE 

Days 1-3  
one  
tablet  
each  
morning

EVENING

Days 4-7  
one  
tablet  
each  
morning  
and  
evening

MORNING

EVENING

**CHANTIX**<sup>®</sup>  
(varenicline) TABLETS  
0.5 mg\* tablets

**CONTINUING WEEK**  
(1 mg† x 14 tablets)

MORNING EVENING

Day 1 

Day 2 

Day 3 

Day 4 

Day 5 

Day 6 

Day 7 

Days 1-7  
one  
tablet  
each  
morning  
and  
evening

MORNING EVENING

**CHANTIX**<sup>®</sup>  
(varenicline) TABLETS  
1 mg† tablets

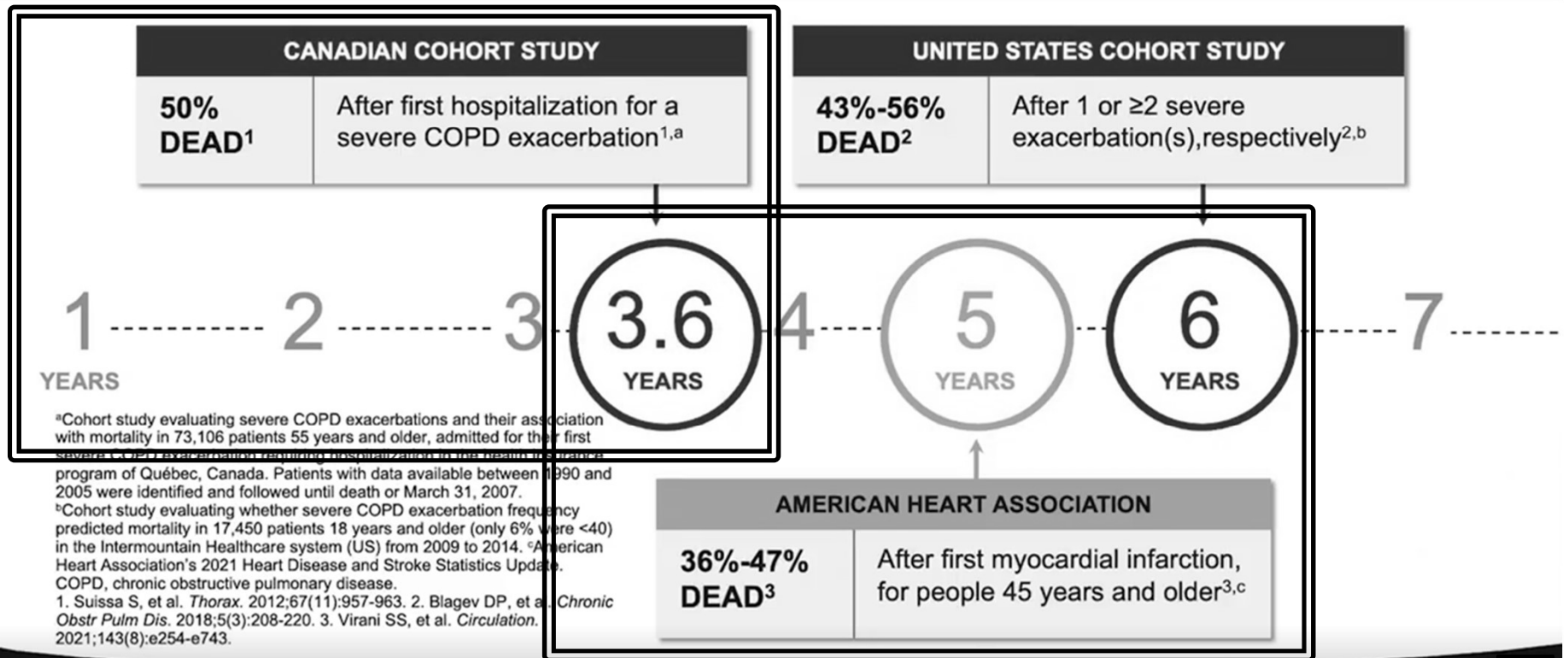
# COPD Exacerbations

Exacerbations are not “bumps” in the road like they are for asthma

Moderate to severe exacerbations are life altering, patients never recover fully.

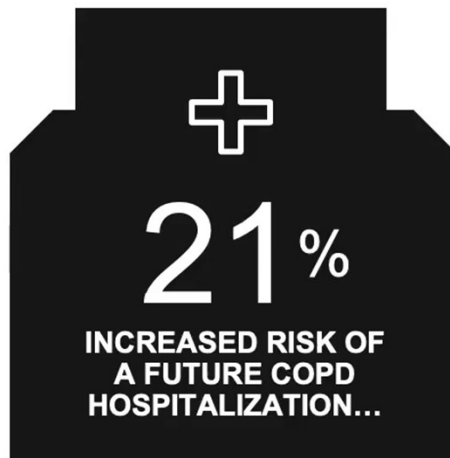
# How bad is an exacerbation?

## COPD Exacerbations May Lead to Increased Mortality



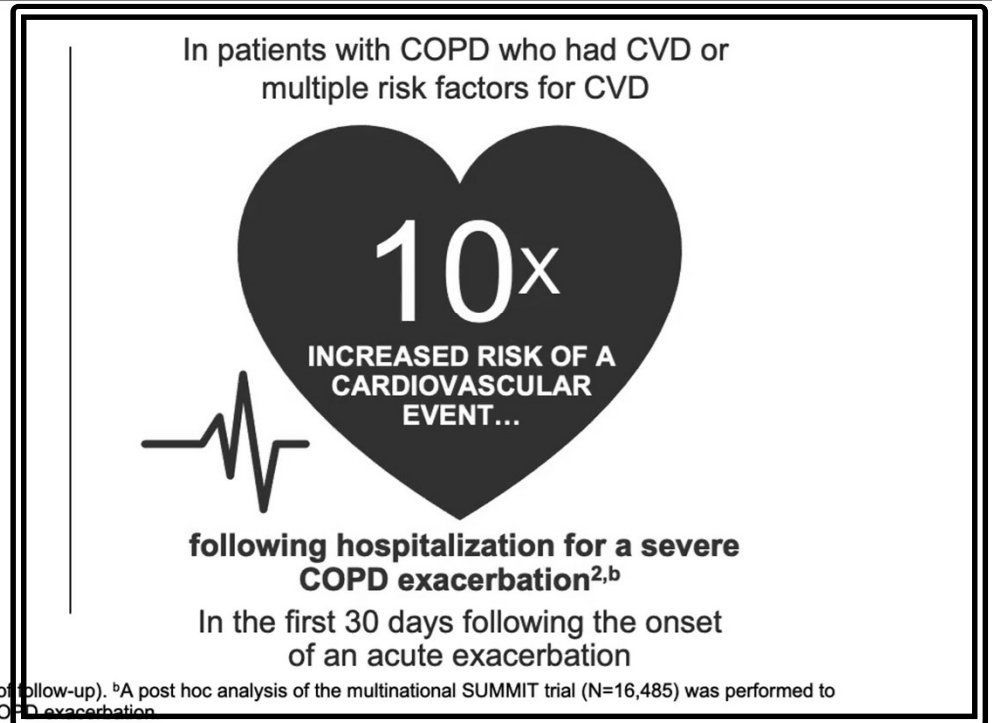
# How bad is an exacerbation?

## COPD Exacerbations Increase Risk of Poor Outcomes



**for severe COPD exacerbation after just 1 moderate exacerbation<sup>1,a</sup>**

Comparing patients with 1 moderate acute exacerbation of COPD with those who had none



In patients with COPD who had CVD or multiple risk factors for CVD

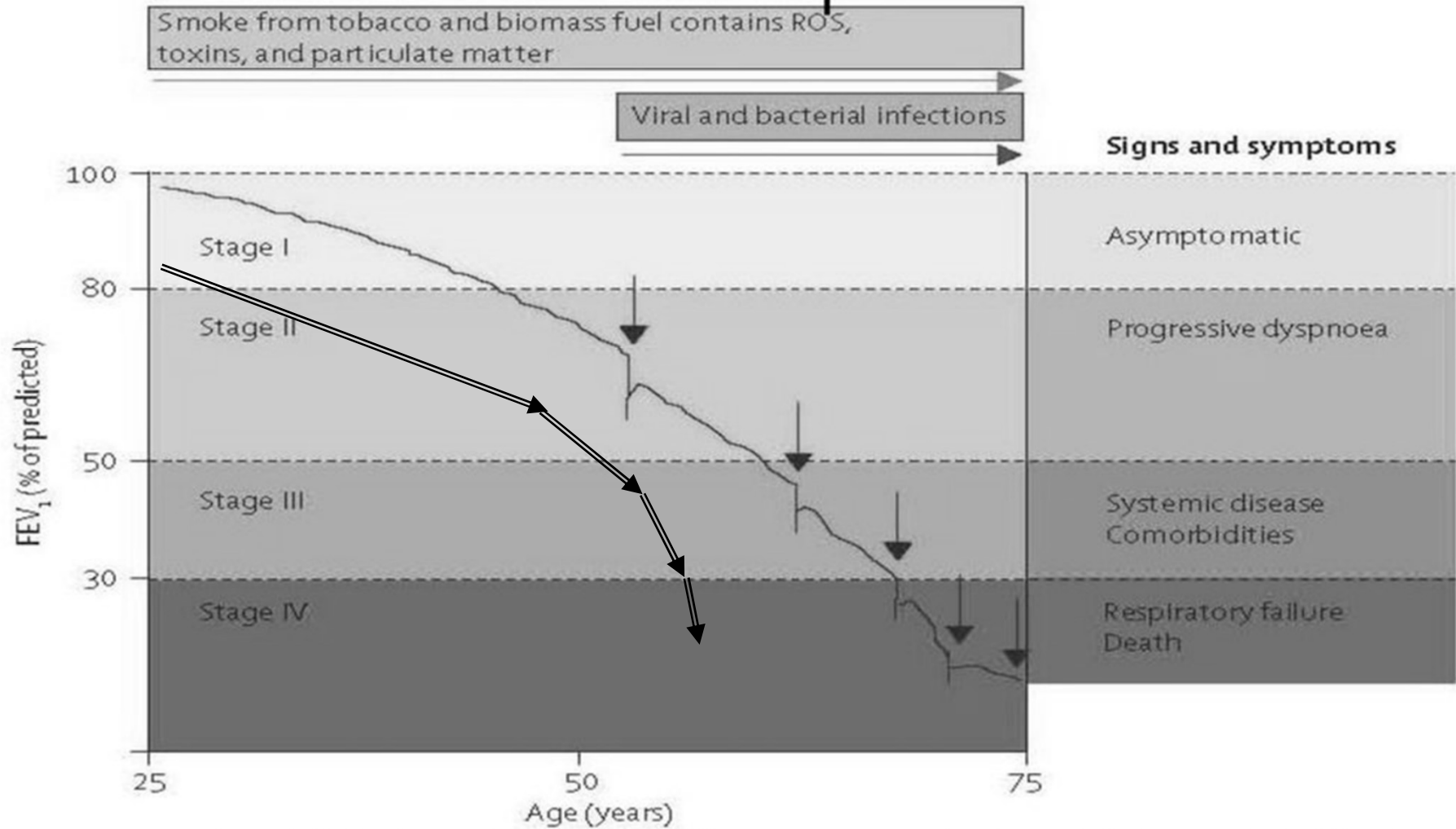
**following hospitalization for a severe COPD exacerbation<sup>2,b</sup>**

In the first 30 days following the onset of an acute exacerbation

<sup>a</sup>Data from a UK population-based study of ≈100,000 patients with COPD (up to 10 years of follow-up). <sup>b</sup>A post hoc analysis of the multinational SUMMIT trial (N=16,485) was performed to determine whether the risk for cardiovascular events increases after a moderate/severe COPD exacerbation.

1. Rothnie KJ, et al. *Am J Respir Crit Care Med.* 2018;198(4):464-471. 2. Kunisaki KM, et al. *Am J Respir Crit Care Med.* 2018;198(1):51-57.

# COPD exacerbations & Effect on FEV<sub>1</sub>



Lancet, Vol. 374, Hansel TT, Barnes PJ, New drugs for exacerbations of COPD, Pages 744-55, 2009



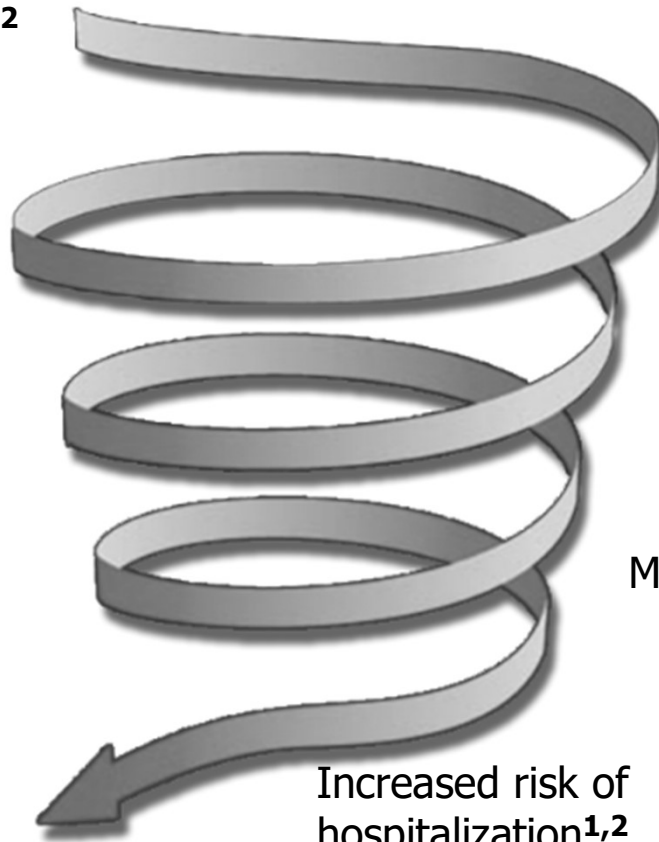
# What does an exacerbation mean to a patient?

Decline in lung function<sup>1,2</sup>

Greater anxiety<sup>3</sup>

Social withdrawal

Increased risk of mortality <sup>8</sup>



Increased symptoms  
(I.e. breathlessness) <sup>6</sup>

Worsening quality of life<sup>4,5</sup>

More exacerbations<sup>6,7</sup>

Increased risk of hospitalization<sup>1,2</sup>

1. Garcia-Aymerich J *et al.* 2001
2. Donaldson D *et al.* 2002
3. Gore JM *et al.* 2000
4. Seemungal T *et al.* 1998
5. Pauwels P *et al.* 2001
6. Seemungal T *et al.* 2000
7. Garcia-Aymerich J *et al.* 2003
8. Anto JM *et al.* 2001

# COPD Exacerbations

Causes – viral make up about 80% of flares in a standard COPD population.

Bacterial infections, increased BLM smoke or toxin exposure

Ran out of meds/noncompliance

# COPD Exacerbations

Generally, PO steroids are used:

Consider shorter and lower

40 mg for 3 days and 20 mg for 3 days

Patient controlled taper - 40 mg till they are 50% better then 20 mg till they are close to normal

# COPD Exacerbations

Macrolides (or other) should be used for moderate or worse exacerbations.

If you'd like to avoid steroids try Azithromycin 250 mg daily for 10 days.

Have them do their rescue medication Q4H or Q6H for a couple days then move back to PRN.

# COPD Exacerbations

Prevent these with vaccines, talk over compliance and cost.

Provide a “Flare Kit” with prednisone and a macrolide, have them start this then call

- **Add a macrolide.** The best available evidence exists for the use of azithromycin, especially in those who are not current smokers.<sup>(21,22)</sup> Consideration to the development of resistant organisms should be factored into decision-making.
- **Stopping ICS.** This can be considered if there are adverse effects (such as pneumonia) or a reported lack of efficacy. However, a blood eosinophil count  $\geq 300$  cells / $\mu$ L identifies patients with the greatest likelihood of experiencing more exacerbations after ICS withdrawal and who subsequently should be followed closely for relapse of exacerbations.<sup>(23,24)</sup>

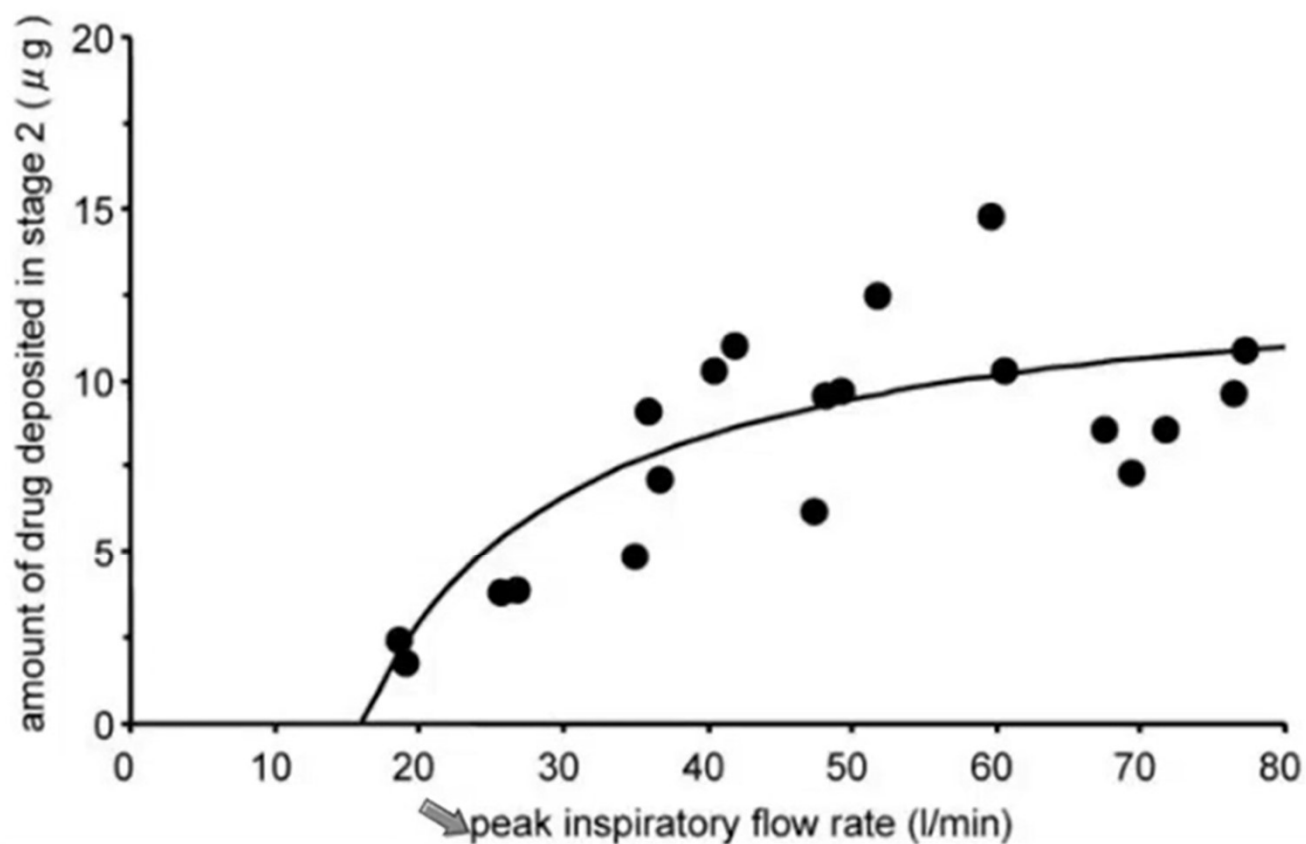
# COPD Best Practices

Can your patient fully inhale their medication?

Different inhalers require more or less force to inhale the medications

# COPD Best Practices

## Drug Deposited in Stage 2 at Various Inspiratory Flow Rates



# COPD Best Practices

Measure this with an In-Check Device (below)

Can also see if they can “make noise” with their inhaler

Can they hold a Post-it note to their lips?

Do they feel nebulized medication is sig better?





## **COPD Best Practices**

Consider moving patients over to nebulized medications, can be life altering. All three categories have options now (list next slide)

# For Reference

## Commonly Used Maintenance Medications in COPD\*

Generic Drug Name	Inhaler Type	DELIVERY OPTIONS			Duration of Action
		Nebulizer	Oral	Injection	
<b>BETA<sub>2</sub>-Agonists</b>					
<b>Short-acting (SABA)</b>					
Fenoterol	MDI	✓	pill, syrup		4-6 hours
Levalbuterol	MDI	✓			6-8 hours
Salbutamol (albuterol)	MDI & DPI	✓	pill, syrup, extended release tablet	✓	4-6 hours 12 hours (ext. release)
Terbutaline	DPI		pill	✓	4-6 hours
<b>Long-acting (LABA)</b>					
Arformoterol		✓			12 hours
Formoterol	DPI	✓			12 hours
Indacaterol	DPI				24 hours
Olodaterol	SMI				24 hours
Salmeterol	MDI & DPI				12 hours
<b>Anticholinergics</b>					
<b>Short-acting (SAMA)</b>					
Ipratropium bromide	MDI	✓			6-8 hours
Oxipropium bromide	MDI				7-9 hours
<b>Long-acting (LAMA)</b>					
Acclidinium bromide	DPI				MDI 12 hours
Glycopyrronium bromide	DPI		solution	✓	12-24 hours
Tiotropium	DPI, SMI, MDI				24 hours
Umeclidinium	DPI				24 hours
Glycopyrrolate		✓			12 hours
Revefenacin		✓			24 hours
<b>Combination Short-Acting Beta<sub>2</sub>-Agonist Plus Anticholinergic in One Device (SABA+SAMA)</b>					
Fenoterol/ipratropium	SMI	✓			6-8 hours
Salbutamol/ipratropium	SMI, MDI	✓			6-8 hours
<b>Combination Long-Acting Beta<sub>2</sub>-Agonist Plus Anticholinergic in One Device (LABA+LAMA)</b>					
Formoterol/aclidinium	DPI				12 hours
Formoterol/glycopyrronium	MDI				12 hours
Indacaterol/glycopyrronium	DPI				12-24 hours
Vilanterol/umeclidinium	DPI				24 hours
Olodaterol/tiotropium	SMI				24 hours
<b>Methylxanthines</b>					
Aminophylline			solution	✓	Variable, up to 24 hours
Theophylline (SR)			pill	✓	Variable, up to 24 hours
<b>Combination of Long-Acting Beta<sub>2</sub>-Agonist Plus Corticosteroid in One Device (LABA+ICS)</b>					
Formoterol/beclometasone	MDI, DPI				12 hours
Formoterol/budesonide	MDI, DPI				12 hours
Formoterol/mometasone	MDI				12 hours
Salmeterol/fluticasone propionate	MDI, DPI				12 hours
Vilanterol/fluticasone furoate	DPI				24 hours
<b>Triple Combination in One Device (LABA+LAMA+ICS)</b>					
Fluticasone/umeclidinium/vilanterol	DPI				24 hours
Beclometasone/formoterol/glycopyrronium	MDI, DPI				12 hours
Budesonide/formoterol/glycopyrrolate	MDI				12 hours
<b>Phosphodiesterase-4 Inhibitors</b>					
Roflumilast			pill		24 hours
<b>Mucolytic Agents</b>					
Erdosteine			pill		12 hours
Carbocysteine†			pill		
N-acetylcysteine†			pill		

\*Not all formulations are available in all countries. In some countries other formulations and dosages may be available. †Dosing regimens are under discussion. MDI = metered dose inhaler; DPI = dry powder inhaler; SMI = soft mist inhaler. Note that glycopyrrolate & glycopyrronium are the same compound.

For  
Reference



# Alpha-1 Antitrypsin (AAT) Deficiency

**AAT is a genetic form of COPD**

**Lab testing is the only way to diagnose**

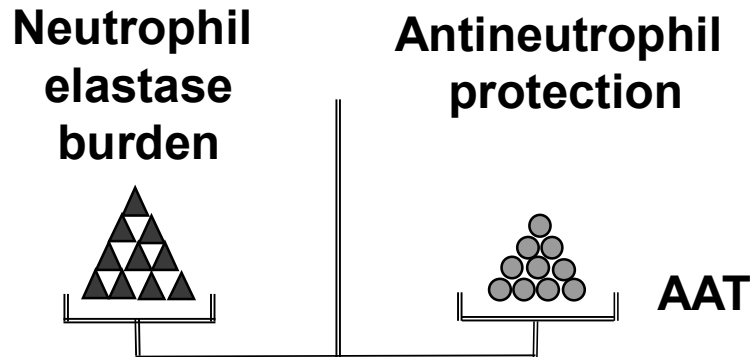
**There is treatment available**

AAT, alpha<sub>1</sub>-antitrypsin; COPD, chronic obstructive pulmonary disease.

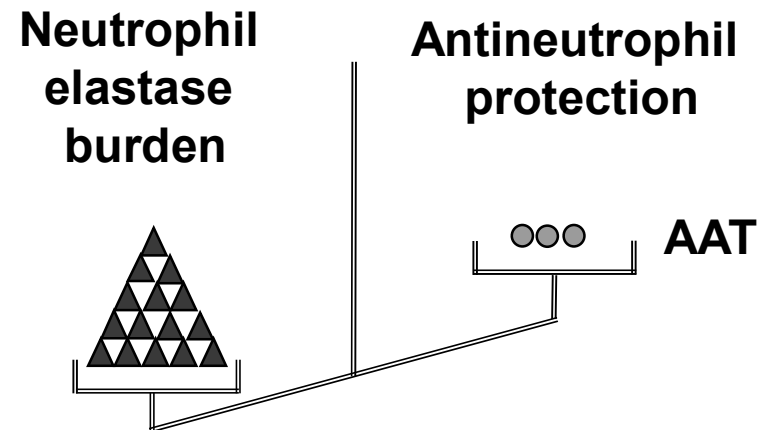
Campbell EJ, et al. *Chest*. 2000;117(5 suppl 1):303S. Brantly M. *Clin Chem*. 2006;52(12):2180-2181. de Serres FJ. *Environ Health Perspect*. 2003;111(16):1851-1854. de Serres FJ, et al. *Clin Genet*. 2003;64(5):382-397. Campos MA, et al. *Chest*. 2005;128(3):1179-1186. Silverman EK, Sandhaus RA. *N Engl J Med*. 2009;360(26):2749-2757. 7. About AAT deficiency. <http://www.ruleitout.org/hcp/about-aat-deficiency/>. Accessed August 3, 2016.

# Low Levels of AAT Leave Lung Tissue Vulnerable

## Normal Protection



## AAT Deficient



AAT, alpha<sub>1</sub>-antitrypsin.

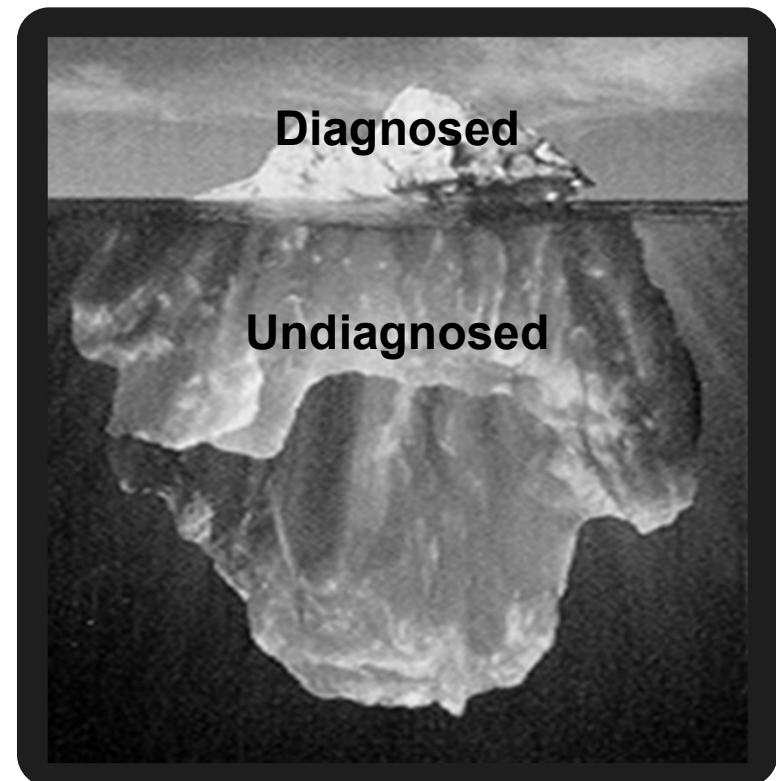
Köhnlein T, Welte T. *Alpha-1 Antitrypsin Deficiency: Clinical Aspects and Management*. Bremen, Germany: UNI-MED Verlag AG; 2007.

# Alpha-1 Is Not a Rare Disease but One That Is Rarely Diagnosed<sup>1</sup>

## The Problem

- Up to 25 million Americans have an abnormal allele (S or Z)<sup>2</sup>
- An estimated 100,000 Americans have alpha-1<sup>3</sup>
- **>90% remain undiagnosed<sup>4,5</sup>**
- **Early diagnosis and treatment is associated with health benefits<sup>6</sup>**
- Most common inherited risk factor for COPD (1 in 10 COPD patients)<sup>6</sup>

## Alpha-1 in the US<sup>3</sup>



COPD, chronic obstructive pulmonary disease.

1. de Serres FJ. *Environ Health Perspect.* 2003;111(16):1851-1854. 2. de Serres FJ, et al. *Clin Genet.* 2003;64(5):382-397. 3. Campos MA, et al. *Chest.* 2005;128(3):1179-1186. 4. Silverman EK, Sandhaus RA. *N Engl J Med.* 2009;360(26):2749-2757. 5. About AAT deficiency. <http://www.ruleitout.org/hcp/about-aat-deficiency/>. Accessed August 3, 2016. 6. Brantly M. *Clin Chem.* 2006;52(12):2180-2181.

# American Thoracic Society Guidelines Recommend Testing ALL Symptomatic COPD Patients

## The American Thoracic Society Guidelines

- Test all adults with symptomatic COPD, **regardless of smoking history**
- Test all adults with symptomatic emphysema, **regardless of smoking history**
- Test all adults with symptomatic asthma whose airflow obstruction is incompletely reversible after bronchodilator therapy
- Test asymptomatic patients with persistent obstruction on pulmonary function tests and with identifiable risk factors (eg, smoking, occupational exposure)
- Test siblings of individuals with alpha-1

COPD, chronic obstructive pulmonary disease.

American Thoracic Society/European Respiratory Society. *Am J Respir Crit Care Med.* 2003;168(7):818-900.



# My COPD Action Plan

Patients and healthcare providers should complete this action plan together.  
This plan should be discussed at each visit and updated as needed.

The green, yellow and red zones show symptoms of COPD. The list of symptoms is not complete. You may experience other symptoms. In the "Actions" column, your healthcare provider will recommend actions for you to take. Your healthcare provider may write down other actions in addition to those listed here.

<https://www.lung.org/getmedia/c7657648-a30f-4465-af92-fc762411922e/copd-action-plan.pdf>

## 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
- Avoid tobacco product use and other 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
- Using quick relief inhaler/nebulizer more often
- More swelling in ankles
- 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 medication
- Use quick relief inhaler every \_\_\_\_\_ hours
- Start an oral corticosteroid (specify name, dose, and duration) \_\_\_\_\_
- Start an antibiotic (specify name, dose, and duration) \_\_\_\_\_
- Use oxygen as prescribed
- Get plenty of rest
- Use pursed lip breathing
- Avoid secondhand smoke, e-cigarette aerosol, and other inhaled irritants
- Call provider immediately if symptoms do not 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 pains
- Coughing up blood

## Actions

- Call 911 or seek medical care immediately
- While getting help, immediately do the following: \_\_\_\_\_
- \_\_\_\_\_

The information contained in this document is for educational use only. It should not be used as a substitute for professional medical advice, diagnosis or treatment. THE AMERICAN LUNG ASSOCIATION DOES NOT ENDORSE ANY PRODUCT, DEVICE OR SERVICE, INCLUDING ANY PARTICULAR COPD MEDICATION OR TREATMENT DEVICE. For more information, visit [www.Lung.org](http://www.Lung.org) or call 1-800-LUNG-USA (1-800-586-4872) © 2016 American Lung Association

1-800-LUNG-USA | [Lung.org/copd](http://Lung.org/copd)

ALA COPD AP V3 3/17/2021



**Thank you for  
attending, reach  
out to me if you  
have questions!**

**208-404-5338  
brianbizik@yahoo.com**