California URGENT CARE ASSOCIATION

2024 WESTERN REGIONAL

URGENT CARE CONFERENCE

COPD in Urgent Care
GOLD Guidelines
CUCA - 2024

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California URGENT CARE ASSOCIATION

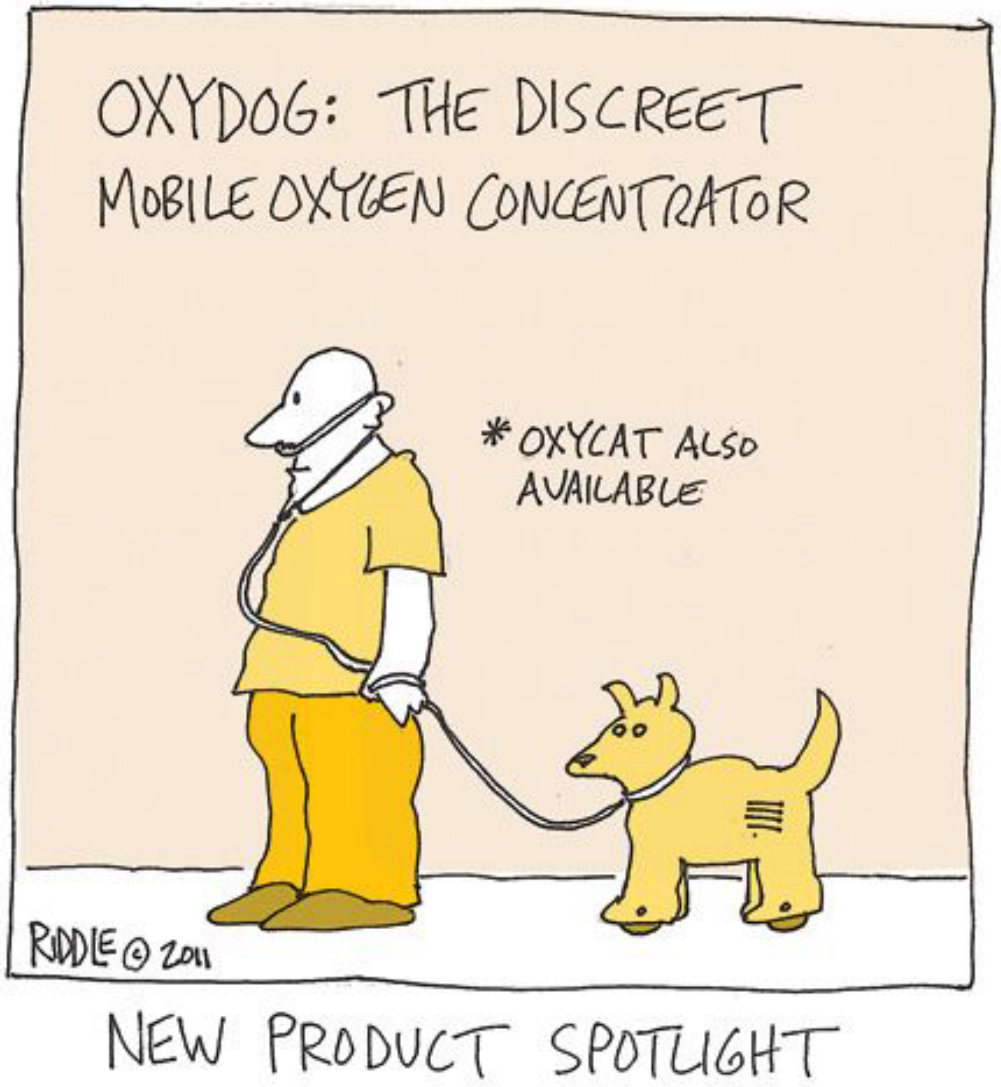
Disclosures

INDUSTRY AFFILIATIONS
Grifols Pharmaceutical - speaker, consultant
AstraZeneca – advisory board, speaker
Regeneron – advisory board
Pfizer – speaker (Paxlovid)

CLINICAL RESEARCH
2017 – Sub-I, Genetech 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

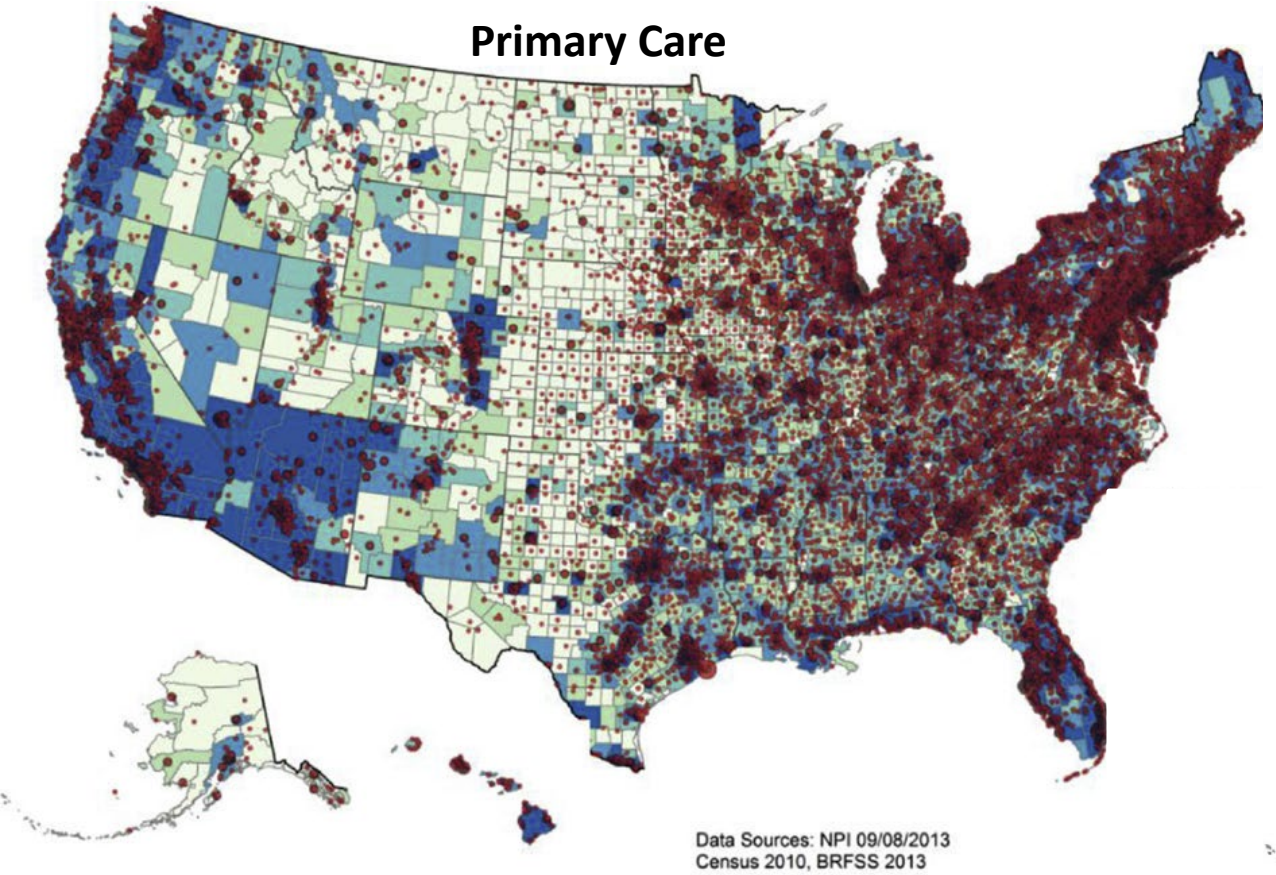
Brian Bizik does not intend to discuss the use of any off-label use/unapproved use of drugs or devices with the exception of NON-APPROVED inhaler recommendations that are Guideline based but not yet FDA approved (asthma only)

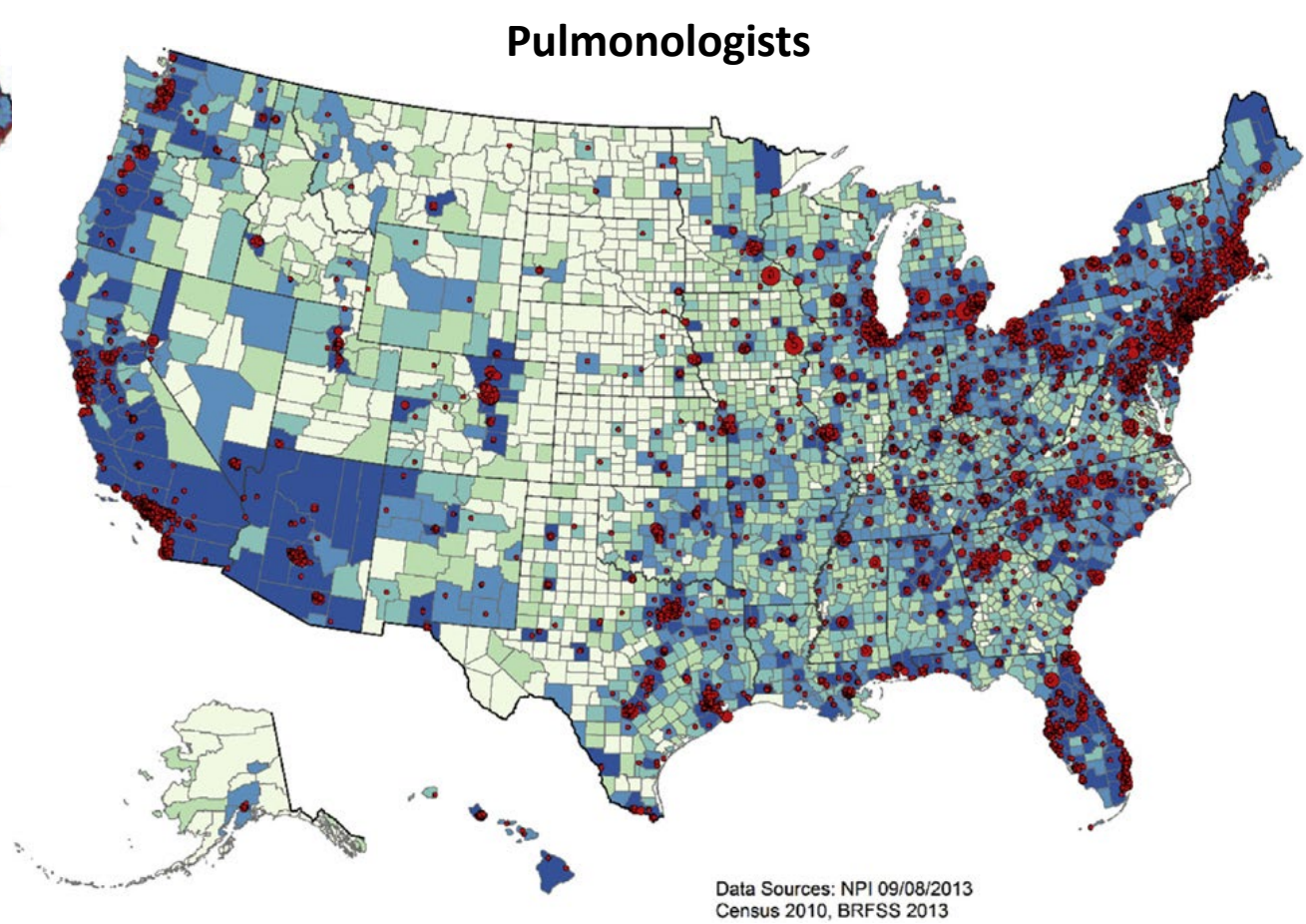
- **Review medication classes, there are only three.**
- **Talk over the guidelines, what changes have there been and why does this matter for the UC?**
- **We need to GET patients better then take steps to KEEP them better. Next level care!**



Plan For Today

Primary vs Specialist Care – UCs is where many seek care





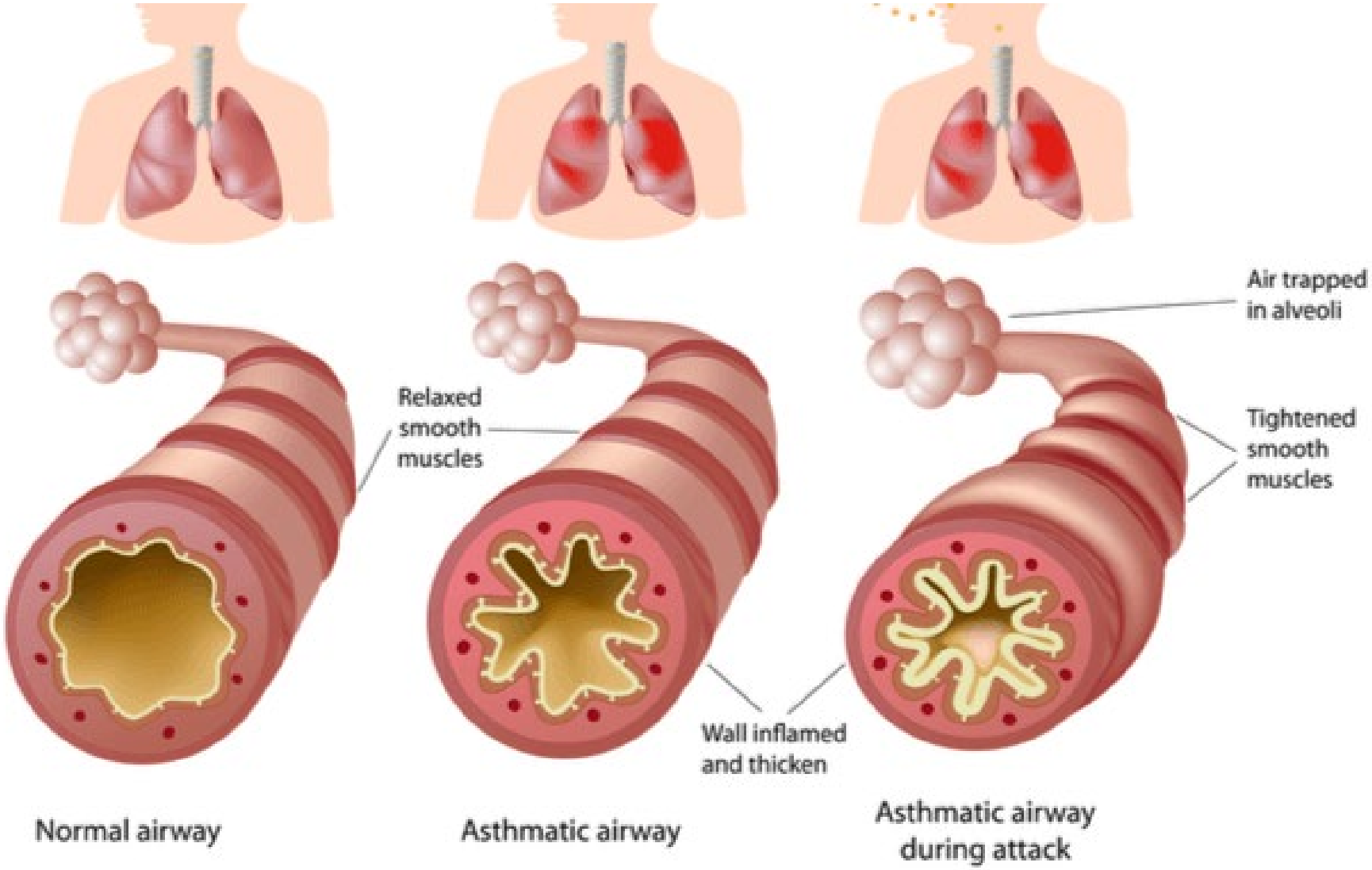
Croft JB, et al. *Chest*. 2016;150(3):544-53.

Asthma and COPD

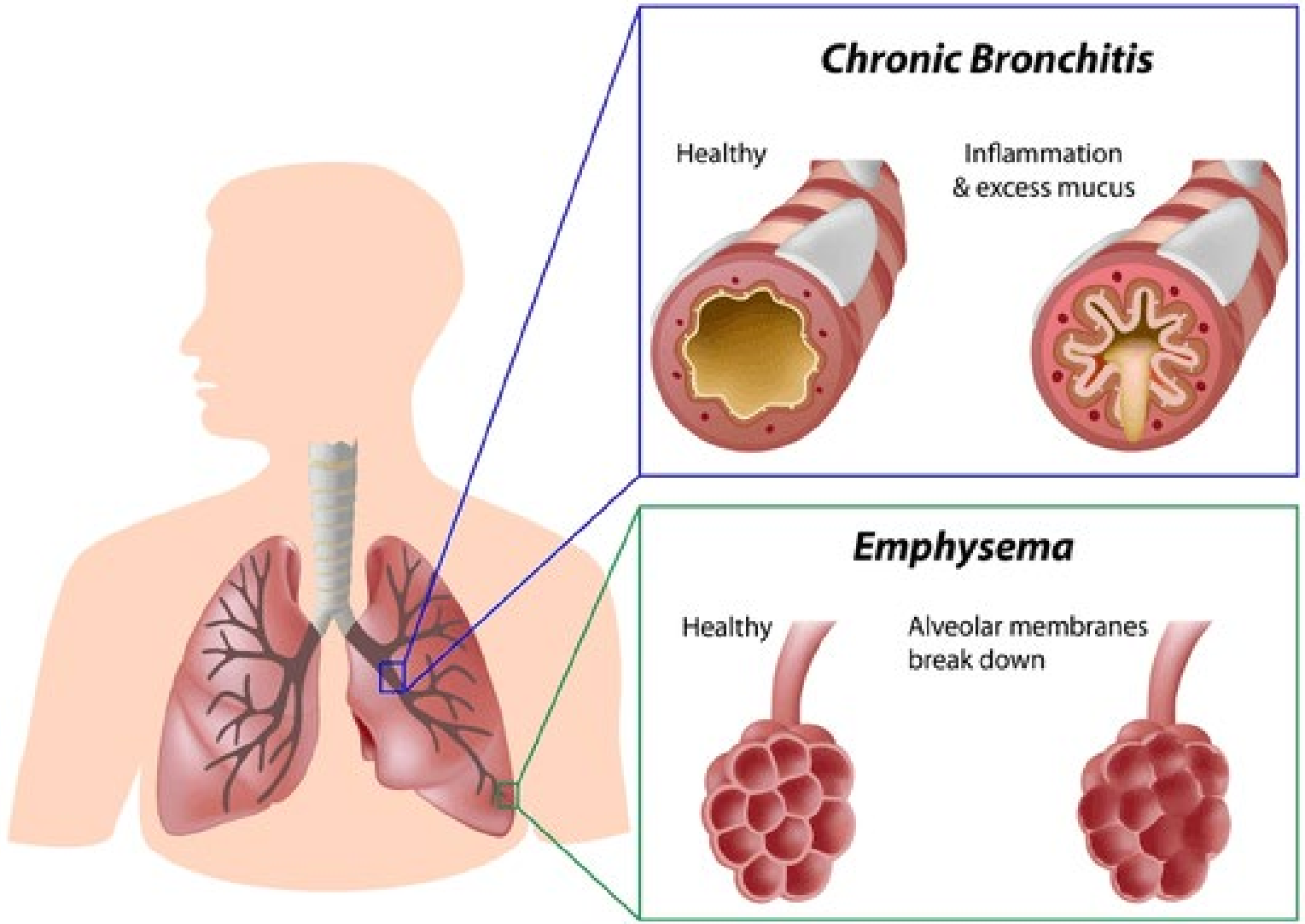
- **Asthma – bronchoconstriction, airway inflammation, mucous production**

- **COPD – tissue destruction, chronic cough, due to exposure (tobacco) most of the time.**

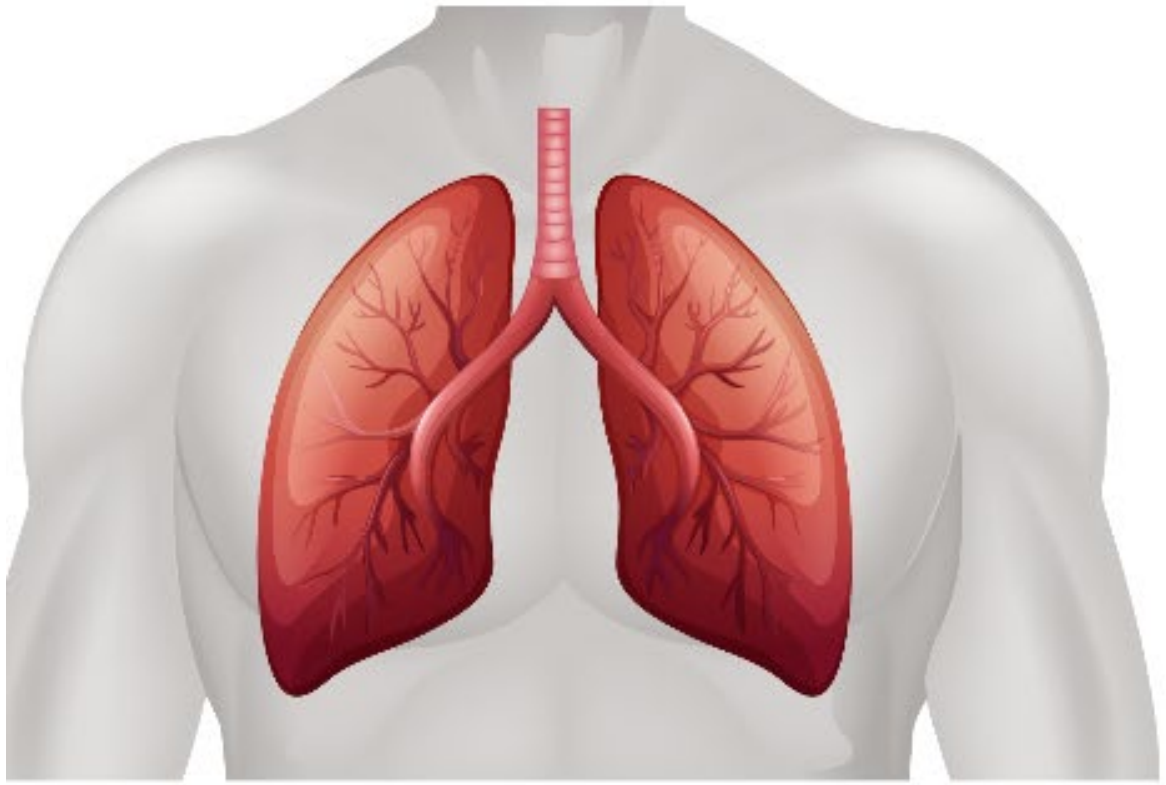
Asthma – bronchoconstriction, airway inflammation, mucous production



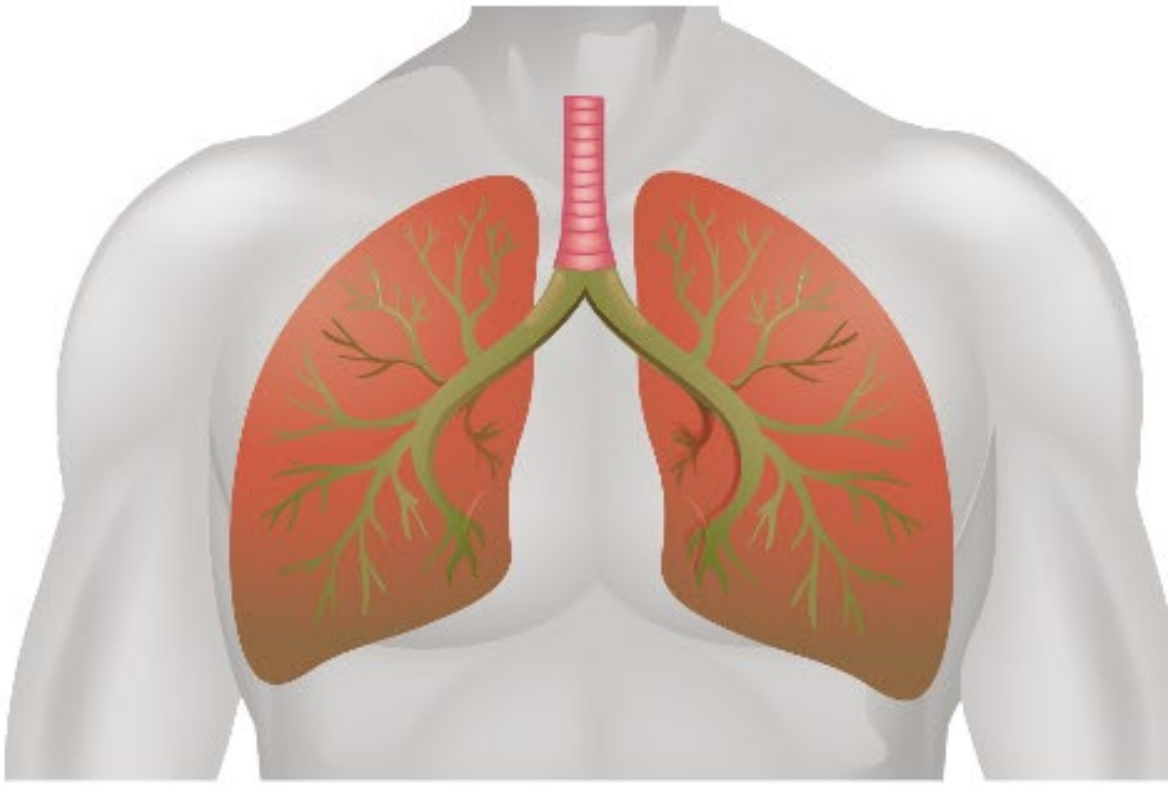
COPD – Chronic (long term, you get this over time), Obstructive (elasticity is gone, things get floppy and weak, alveoli break down)



COPD – Big, floppy lungs. Flattened diaphragm. Harder to inhaler but MUCH hard to exhale, air is trapped, stale.



Normal Lungs



Hyperinflated Lungs

COPD – normal vs hyperinflated lungs

Respiratory medications: Three categories of medications

Albuterol

Short – SABA
Long – LABA

Bronchodilators

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

Allergy & Asthma Network

2024 Respiratory Treatments

American College of Allergy, Asthma & Immunology

VIATRIS · Theravance Biopharma

= DOSE INDICATOR
G = GENERIC AVAILABLE
N = NEBULIZER VIAL
DISEASE STATES:
A = ASTHMA
C = COPD

SHORT-ACTING BETA$_2$-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

- **Albuterol Sulfate Inhalation Solution** — 0.63, 1.5, 2.5 mg; 3 mL — G N
- **ProAir® Digihaler™** — 90 mcg — albuterol sulfate inhalation powder — DOSE A
- **ProAir RespiClick®** — 90 mcg — albuterol sulfate inhalation powder — DOSE A
- **Proventil® HFA** — 90 mcg — albuterol sulfate — DOSE A G
- **Ventolin® HFA** — 90 mcg — albuterol sulfate — DOSE A G
- **Xopenex®** — 0.31, 0.63, 1.25 mg; 3 mL — levalbuterol hydrochloride inhalation solution — A G N
- **Xopenex HFA®** — 45 mcg — levalbuterol tartrate — A G

LONG-ACTING BETA$_2$-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

- **Brovana®** — 15 mg; 2 mL — arformoterol tartrate inhalation solution — C N
- **Perforomist®** — 20 mcg; 2 mL — formoterol fumarate inhalation solution — C N
- **Serevent® Diskus®** — 50 mcg — salmeterol xinafoate inhalation powder — DOSE A C
- **Striverdi® Respimat®** — 2.5 mcg — olodaterol hydrochloride — DOSE C

INHALED CORTICOSTEROIDS

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

- **Alvesco® HFA** — 80, 160 mcg — ciclesonide — DOSE A
- **ArmonAir® Digihaler™** — 55, 113, 232 mcg — fluticasone propionate inhalation powder — DOSE A
- **Arnuity® Ellipta®** — 50, 100, 200 mcg — fluticasone furoate inhalation powder — DOSE A
- **Asmanex® HFA** — 50, 100, 200 mcg — mometasone furoate — DOSE A
- **Asmanex® Twisthaler®** — 110, 220 mcg — mometasone furoate inhalation powder — DOSE A
- **Fluticasone Propionate Diskus Inhalation Powder** — 50, 100, 250 mcg — Approved generic of Flovent Diskus — DOSE A
- **Fluticasone Propionate HFA** — 44, 110, 220 mcg — Approved generic of Flovent HFA — DOSE A
- **Pulmicort Flexhaler®** — 90, 180 mcg — budesonide inhalation powder — DOSE A
- **Pulmicort Respules®** — 0.25, 0.50, 1.0 mg; 2 mL — budesonide inhalation suspension — A G N
- **QVAR® Redihaler™** — 40, 80 mcg — beclomethasone dipropionate — DOSE 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 — DOSE C

LONG-ACTING

- **Incruse® Ellipta®** — 62.5 mcg — umeclidinium inhalation powder — DOSE C
- **Ipratropium Bromide Inhalation Solution** — 0.5, 2.5 mg; 2.5 mL — G G N
- **Spiriva® Handi Haler®** — 18 mcg — tiotropium bromide inhalation powder — C
- **Spiriva® Respimat®** — 1.25, 2.5 mcg — tiotropium bromide — DOSE A C
- **Tudorza™ Pressair™** — 400 mcg — aclidinium bromide inhalation powder — DOSE C
- **Yupelri®** — 175 mcg; 3 mL — revefenacin inhalation solution — C N

PDE4 INHIBITORS

target lung inflammation and reduce exacerbations

- **Daliresp®** — 250, 500 mcg — roflumilast — C

COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta$_2$-agonist (LABA)

- **Advair Diskus®** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol inhalation powder — DOSE A C G
- **Advair® HFA** — 45/21, 115/21, 230/21 mcg — fluticasone propionate and salmeterol xinafoate — DOSE A G
- **AirDuo® Digihaler™** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DOSE A
- **AirDuo® RespiClick®** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DOSE A G
- **Breo® Ellipta®** — 50/25, 100/25, 200/25 mcg — fluticasone furoate and vilanterol inhalation powder — DOSE A C G
- **Breyna™** — 80/4.5, 160/45 mcg — budesonide and formoterol fumarate dihydrate (approved generic of Symbicort) — DOSE A C
- **Dulera®** — 50/5, 100/5, 200/5 mcg — mometasone furoate and formoterol fumarate dihydrate — DOSE A
- **Symbicort®** — 80/4.5, 160/4.5 mcg — budesonide and formoterol fumarate dihydrate — DOSE A C G G
- **Wixela™ Inhub™** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol xinafoate (approved generic of Advair Diskus) — DOSE A C

contain both long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Anoro® Ellipta®** — 62.5/25 mcg — umeclidinium and vilanterol inhalation powder — DOSE C
- **Bevespi Aerosphere®** — 9/4.8 mcg — glycopyrrolate and formoterol fumarate — DOSE C
- **Duaklir® Pressair®** — 400, 12 mcg — aclidinium bromide and formoterol fumarate — DOSE C
- **Stiolto™ Respimat®** — 2.5/2.5 mcg — tiotropium bromide and olodaterol — DOSE C

contain inhaled corticosteroid, long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Trelegy® Ellipta®** — 200/62.5/25 mcg, 100/62.5/25 mcg — fluticasone furoate, umeclidinium and vilanterol inhalation powder — DOSE A C
- **Breztri Aerosphere™** — 160/9/4.8 mcg — budesonide, glycopyrrolate and formoterol fumarate — DOSE C

contain short-acting beta$_2$-agonist and short-acting muscarinic antagonist

- **Combivent® Respimat®** — 20/100 mcg — ipratropium bromide and albuterol — DOSE C
- **Ipratropium Bromide and Albuterol Sulfate Inhalation Solution** — 2.5 mg; 3 mL — C G

contain inhaled corticosteroid and short-acting beta$_2$-agonist (SABA)

- **AirSupra®** — 80, 90 mcg — budesonide and albuterol — DOSE A

BIOLOGICS

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

- **Cinqair®** — 62.5/25 ml — reslizumab — A
- **Dupixent®** — 100, 200, 300 mg — dupilumab — A
- **Fasenra™** — 30 mg — benralizumab — A
- **Nucala®** — 100 mg — mepolizumab — A
- **Tezspire™** — 210 mg — tezepelumab-ekko — A
- **Xolair®** — 75 to 375 mg — omalizumab — A

LEUKOTRIENE MODIFIERS

block chemicals called leukotrienes that cause airway inflammation; available as tablet or granules

- **Singulair®** — 4, 5, 10 mg — montelukast — A
- **Zafirlukast** — 10, 20 mg — zafirlukast — A
- **Zyflo CR®** — 600 mg — zileuton — A

Respiratory medications: Three categories of medications

Albuterol

Short – SABA
Long – LABA

Bronchodilators

Steroids

All long acting

Reduce most every aspect of inflammation

Medication Categories: Steroids

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

Almost every inflammation mediator is reduced

Many actions, all with a central goal of reducing inflammation at the source

Most aspects of inflammation are affected

2024 Respiratory Treatments

Allergy & Asthma Network

800.878.4403 • AllergyAsthmaNetwork.org

Allergy & Asthma Network is a national nonprofit organization dedicated to ending needless death and suffering due to asthma, allergies and related conditions through outreach, education, advocacy and research.

American College of Allergy, Asthma & Immunology

VIATRIS

Theravance Biopharma

DOSE INDICATOR
G = GENERIC AVAILABLE
N = NEBULIZER VIAL
DISEASE STATES:
A = ASTHMA
C = COPD

SHORT-ACTING BETA$_2$-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

- **Albuterol Sulfate Inhalation Solution** — 0.63, 1.5, 2.5 mg; 3 mL — G N
- **ProAir® Digihaler™** — 90 mcg — albuterol sulfate inhalation powder — DOSE A
- **ProAir RespiClick®** — 90 mcg — albuterol sulfate inhalation powder — DOSE A
- **Proventil® HFA** — 90 mcg — albuterol sulfate — DOSE A G
- **Ventolin® HFA** — 90 mcg — albuterol sulfate — DOSE A G
- **Xopenex®** — 0.31, 0.63, 1.25 mg; 3 mL — levalbuterol hydrochloride inhalation solution — A G N
- **Xopenex HFA®** — 45 mcg — levalbuterol tartrate — A G

LONG-ACTING BETA$_2$-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

- **Brovana®** — 15 mg; 2 mL — arformoterol tartrate inhalation solution — C N
- **Perforomist®** — 20 mcg; 2 mL — formoterol fumarate inhalation solution — C N
- **Serevent® Diskus®** — 50 mcg — salmeterol xinafoate inhalation powder — DOSE A C
- **Striverdi® Respimat®** — 2.5 mcg — olodaterol hydrochloride — DOSE C

INHALED CORTICOSTEROIDS

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

- **Alvesco® HFA** — 80, 160 mcg — ciclesonide — DOSE A
- **ArmonAir® Digihaler™** — 55, 113, 232 mcg — fluticasone propionate inhalation powder — DOSE A
- **Arnuity® Ellipta®** — 50, 100, 200 mcg — fluticasone furoate inhalation powder — DOSE A
- **Asmanex® HFA** — 50, 100, 200 mcg — mometasone furoate — DOSE A
- **Asmanex® Twisthaler®** — 110, 220 mcg — mometasone furoate inhalation powder — DOSE A
- **Fluticasone Propionate Diskus Inhalation Powder** — 50, 100, 250 mcg — Approved generic of Flovent Diskus — DOSE A
- **Fluticasone Propionate HFA** — 44, 110, 220 mcg — Approved generic of Flovent HFA — DOSE A
- **Pulmicort Flexhaler®** — 90, 180 mcg — budesonide inhalation powder — DOSE A
- **Pulmicort Respules®** — 0.25, 0.50, 1.0 mg; 2 mL — budesonide inhalation suspension — A G N
- **QVAR® Redihaler™** — 40, 80 mcg — beclomethasone dipropionate — DOSE A

MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)

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

- **Atrovent® HFA** — 17 mcg — ipratropium bromide — DOSE C
- **Incruse® Ellipta®** — 62.5 mcg — umeclidinium inhalation powder — DOSE C
- **Ipratropium Bromide Inhalation Solution** — 0.5, 2.5 mg; 2.5 mL — C G N
- **Spiriva® HandiHaler®** — 18 mcg — tiotropium bromide inhalation powder — C
- **Spiriva® Respimat®** — 1.25, 2.5 mcg — tiotropium bromide — DOSE A C
- **Tudorza™ Pressair™** — 400 mcg — aclidinium bromide inhalation powder — DOSE C
- **Yupelri®** — 17.5 mcg; 3 mL — revefenacin inhalation solution — C N

PDE4 INHIBITORS

target lung inflammation and reduce exacerbations

- **Daliresp®** — 250, 500 mcg — roflumilast — C

COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta$_2$-agonist (LABA)

- **Advair Diskus®** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol inhalation powder — DOSE A C G
- **Advair® HFA** — 45/21, 115/21, 230/21 mcg — fluticasone propionate and salmeterol xinafoate — DOSE A G
- **AirDuo® Digihaler™** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DOSE A
- **AirDuo® RespiClick®** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DOSE A G
- **Breo® Ellipta®** — 50/25, 100/25, 200/25 mcg — fluticasone furoate and vilanterol inhalation powder — DOSE A C G
- **Breyna™** — 80/4.5, 160/45 mcg — budesonide and formoterol fumarate dihydrate (approved generic of Symbicort) — DOSE A C
- **Dulera®** — 50/5, 100/5, 200/5 mcg — mometasone furoate and formoterol fumarate dihydrate — DOSE A
- **Symbicort®** — 80/4.5, 160/4.5 mcg — budesonide and formoterol fumarate dihydrate — DOSE A C G
- **Wixela™ Inhub™** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol xinafoate (approved generic of Advair Diskus) — DOSE A C

LONG-ACTING MUSCARINIC ANTAGONIST (LAMA)

contain both long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Anoro® Ellipta®** — 62.5/25 mcg — umeclidinium and vilanterol inhalation powder — DOSE C
- **Bevespi Aerosphere®** — 9/4.8 mcg — glycopyrrolate and formoterol fumarate — DOSE C
- **Duaklir® Pressair®** — 400, 12 mcg — aclidinium bromide and formoterol fumarate — DOSE C
- **Stiolto™ Respimat®** — 2.5/2.5 mcg — tiotropium bromide and olodaterol — DOSE C
- **Trelegy® Ellipta®** — 200/62.5/25 mcg, 100/62.5/25 mcg — fluticasone furoate, umeclidinium and vilanterol inhalation powder — DOSE A C
- **Breztri Aerosphere™** — 160/9/4.8 mcg — budesonide, glycopyrrolate and formoterol fumarate — DOSE C

SHORT-ACTING MUSCARINIC ANTAGONIST

contain both short-acting beta$_2$-agonist and short-acting muscarinic antagonist

- **Combivent® Respimat®** — 20/100 mcg — ipratropium bromide and albuterol — DOSE C
- **Ipratropium Bromide and Albuterol Sulfate Inhalation Solution** — 2.5 mg; 3 mL — C G

SHORT-ACTING BETA$_2$-AGONIST

contain inhaled corticosteroid and short-acting beta$_2$-agonist (SABA)

- **AirSupra®** — 80, 90 mcg — budesonide and albuterol — DOSE A

BIOLOGICS

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

- **Cinqair®** — 62.5/25 mL — reslizumab — A
- **Dupixent®** — 100, 200, 300 mg — dupilumab — A
- **Fasenra™** — 30 mg — benralizumab — A
- **Nucala®** — 100 mg — mepolizumab — A
- **Tezspire™** — 210 mg — tezepelumab-ekko — A
- **Xolair®** — 75 to 375 mg — omalizumab — A

LEUKOTRIENE MODIFIERS

block chemicals called leukotrienes that cause airway inflammation; available as tablet or granules

- **Singulair®** — 4, 5, 10 mg — montelukast — A
- **Zafirlukast** — 10, 20 mg — zafirlukast — A
- **Zyflo CR®** — 600 mg — zileuton — A

Respiratory medications: Three categories of medications

Albuterol

Short – SABA
Long – LABA

Bronchodilators

SAMA/LAMA

Short – SAMA
Long – LAMA

Anticholinergic and constriction prevention

Steroids

All long acting

Reduce most every aspect of inflammation

Medication Categories: SAMA/LAMA

- Ipratropium bromide is our only short acting muscarinic, and there are several long acting

- These are anti-cholinergic medications that dry up secretions and help prevent constriction

2024 Respiratory Treatments

Allergy & Asthma Network

800.878.4403 • AllergyAsthmaNetwork.org

Allergy & Asthma Network is a national nonprofit organization dedicated to ending needless death and suffering due to asthma, allergies and related conditions through outreach, education, advocacy and research.

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- **Breyna™** — 80/4.5, 160/45 mcg — budesonide and formoterol fumarate dihydrate (approved generic of Symbicort) — HFA A C
- **Dulera®** — 50/5, 100/5, 200/5 mcg — mometasone furoate and formoterol fumarate dihydrate — HFA A
- **Symbicort®** — 80/4.5, 160/4.5 mcg — budesonide and formoterol fumarate dihydrate — DPI A C G
- **Wixela™ Inhub™** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol xinafoate (approved generic of Advair Diskus) — HFA A C

contain both long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Anoro® Ellipta®** — 62.5/25 mcg — umeclidinium and vilanterol inhalation powder — DPI C
- **Bevespi Aerosphere®** — 9/4.8 mcg — glycopyrrolate and formoterol fumarate — HFA C
- **Duaklir® Pressair®** — 400, 12 mcg — aclidinium bromide and formoterol fumarate — DPI C
- **Stiolto™ Respimat®** — 2.5/2.5 mcg — tiotropium bromide and olodaterol — SMI C

contain inhaled corticosteroid, long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Trelegy® Ellipta®** — 200/62.5/25 mcg, 100/62.5/25 mcg — fluticasone furoate, umeclidinium and vilanterol inhalation powder — DPI A C
- **Breztri Aerosphere™** — 160/9/4.8 mcg — budesonide, glycopyrrolate and formoterol fumarate — HFA C

contain both short-acting beta$_2$-agonist and short-acting muscarinic antagonist

- **Combivent® Respimat®** — 20/100 mcg — ipratropium bromide and albuterol — SMI C
- **Ipratropium Bromide and Albuterol Sulfate Inhalation Solution** — 2.5 mg; 3 mL — C G

contain inhaled corticosteroid and short-acting beta$_2$-agonist (SABA)

- **AirSupra®** — 80, 90 mcg — budesonide and albuterol — DPI A

BIOLOGICS

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

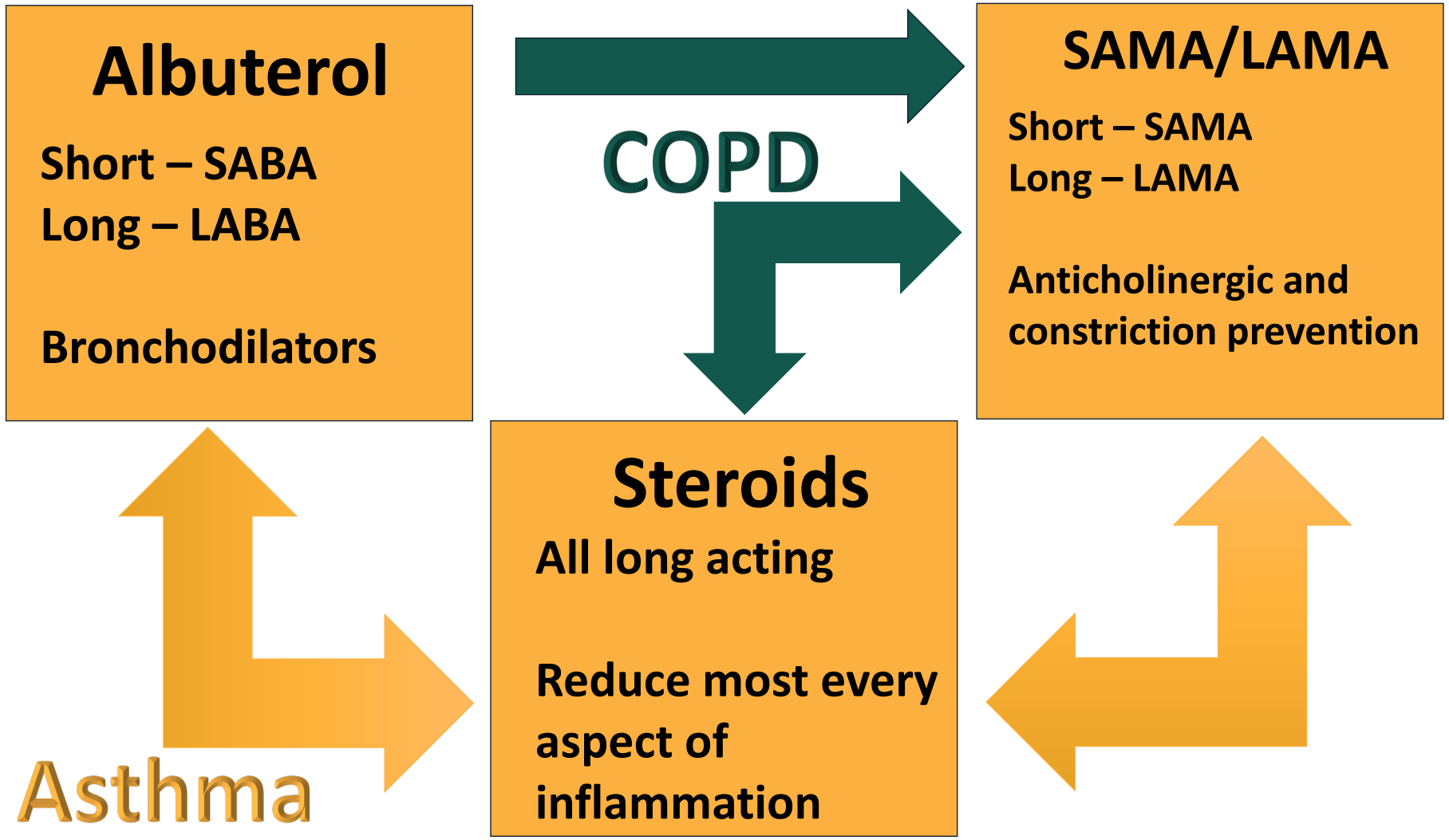
- **Cinqair®** — 62.5/25 mL — reslizumab — A
- **Dupixent®** — 100, 200, 300 mg — dupilumab — A
- **Fasenra™** — 30 mg — benralizumab — A
- **Nucala®** — 100 mg — mepolizumab — A
- **Tezspire™** — 210 mg — tezepelumab-ekko — A
- **Xolair®** — 75 to 375 mg — omalizumab — A

LEUKOTRIENE MODIFIERS

block chemicals called leukotrienes that cause airway inflammation; available as tablet or granules

- **Singulair®** — 4, 5, 10 mg — montelukast — A
- **Zafirlukast** — 10, 20 mg — zafirlukast — A
- **Zyflo CR®** — 600 mg — zileuton — A

Respiratory medications: Three categories of medications



California URGENT CARE ASSOCIATION

QR Code for Inhaler Chart – English

California URGENT CARE ASSOCIATION

QR Code for Inhaler Chart – Spanish

California URGENT CARE ASSOCIATION

For Reference

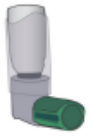
RESPTREC®
RESPIRATORY TRAINING
& EDUCATOR COURSE

COPD MEDICATIONS

www.resptrec.org
www.lungsask.ca

Short-Acting Bronchodilators

SAMA
(Short-Acting Muscarinic Antagonist)
USE REGULARLY or PRN



Atrovent® MDI
(ipratropium bromide)
20 mcg/dose

Duration: 4-6h
Company: BI
*nebules also available

Company Key
AZ – AstraZeneca Canada Inc.
BI – Boehringer Ingelheim Canada Ltd.
GSK – GlaxoSmithKline Inc.
Novartis – Novartis Pharmaceuticals Canada Inc.
Valeant – Valeant Canada
Viatris – Viatris

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
*nebules and generic brands available

Long-Acting Bronchodilators

LAMA
(Long-Acting Muscarinic Antagonist)
USE REGULARLY

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

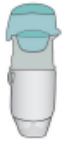
Duration: 24h
Company: GSK

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

Duration: 24h
Company: Novartis

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

Duration: 24h
Company: BI



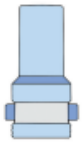
Spiriva® Respimat®
(tiotropium bromide monohydrate)
2.5 mcg/dose

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

ICS/LAMA/LABA
USE REGULARLY

Breztri™ Aerosphere®
(budesonide/glycopyronium/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

*only the Advair® Diskus® has been approved for COPD use.

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

Duration: 12h
Company: GSK

Breo™ Ellipta®
(fluticasone furoate/vilanterol trifenatate)
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: Viatris

Trelegy™ Ellipta®
(fluticasone furoate/umeclidinium bromide/vilanterol trifenatate)
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
*nebules also available

LAMA and LABA
USE REGULARLY

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

Duration: 24h
Company: GSK

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

Duration: 12h
Company: AZ

Inspiolto® 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

California URGENT CARE ASSOCIATION

GLOBAL INITIATIVE FOR CHRONIC OBSTRUCTIVE LUNG DISEASE (GOLD):

California URGENT CARE ASSOCIATION

www.goldcopd.org

https://goldcopd.org/2024-gold-report/

California URGENT CARE ASSOCIATION

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.'

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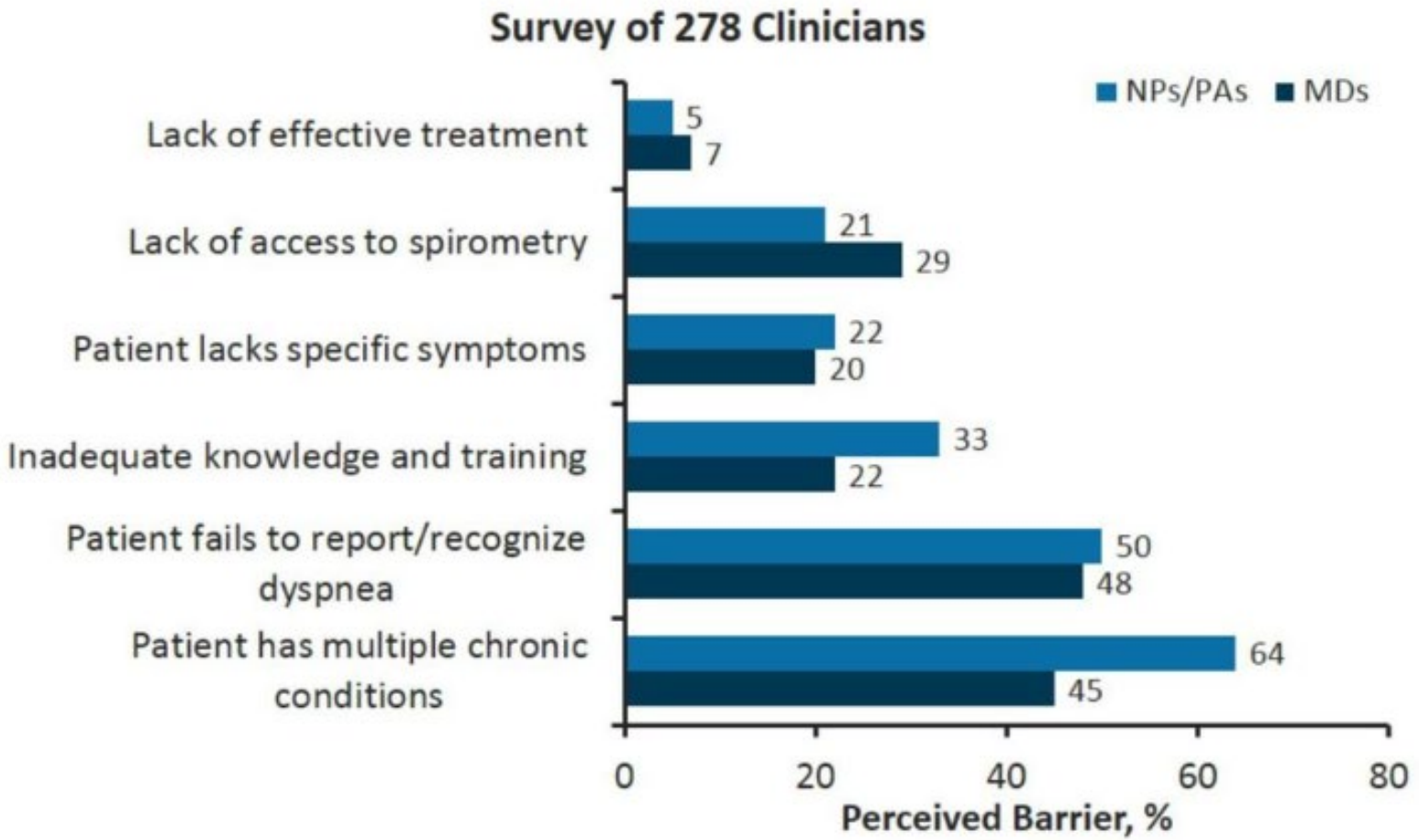
Why is COPD so Underdiagnosed?



Yawn BP, et al. *Int J Chron Obstruct Pulmon Dis.* 2008;3:311-317.

Consider COPD in a patient with any of these characteristics

Symptom	Detail
Dyspnea that is:	• Progressive over time • Characteristically worse with exercise • Persistent
Chronic cough	• May be intermittent and unproductive • Recurrent wheeze
Chronic sputum production	• Any pattern of chronic sputum production may indicate COPD
Recurrent LRTIs	
History of risk factors	• Host factors (eg, genetic factors, congenital/developmental abnormalities) • Tobacco smoke • Smoke from home cooking and heating fuels • Occupational dusts, vapors, fumes, gases and other chemicals
Family history of COPD and/or childhood factors	• Examples include: low birthweight, childhood respiratory infections, Hx of Alpha-1 Antitrypsin Deficiency or unexplained pulmonary disease

These indicators are not diagnostic themselves, but the presence of multiple key indicators increases the probability of a diagnosis of COPD. COPD, chronic obstructive pulmonary disease; GOLD, Global Initiative for Chronic Obstructive Lung Disease; LRTI, lower respiratory tract infection.
2023 GOLD Report. https://goldcopd.org/2023-gold-report-2/.

Diagnose COPD and then Staging

CLASSIFICATION OF AIRFLOW LIMITATION SEVERITY IN COPD (BASED ON POST-BRONCHODILATOR FEV_1)

In patients with FEV1/FVC < 0.70:

GOLD 1:	Mild	$FEV_1 \geq 80\%$ predicted
GOLD 2:	Moderate	$50\% \leq FEV_1 < 80\%$ predicted
GOLD 3:	Severe	$30\% \leq FEV_1 < 50\%$ predicted
GOLD 4:	Very Severe	$FEV_1 < 30\%$ predicted

This is comparing the patient to themselves – how much of their own air can they get out in 1 second

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

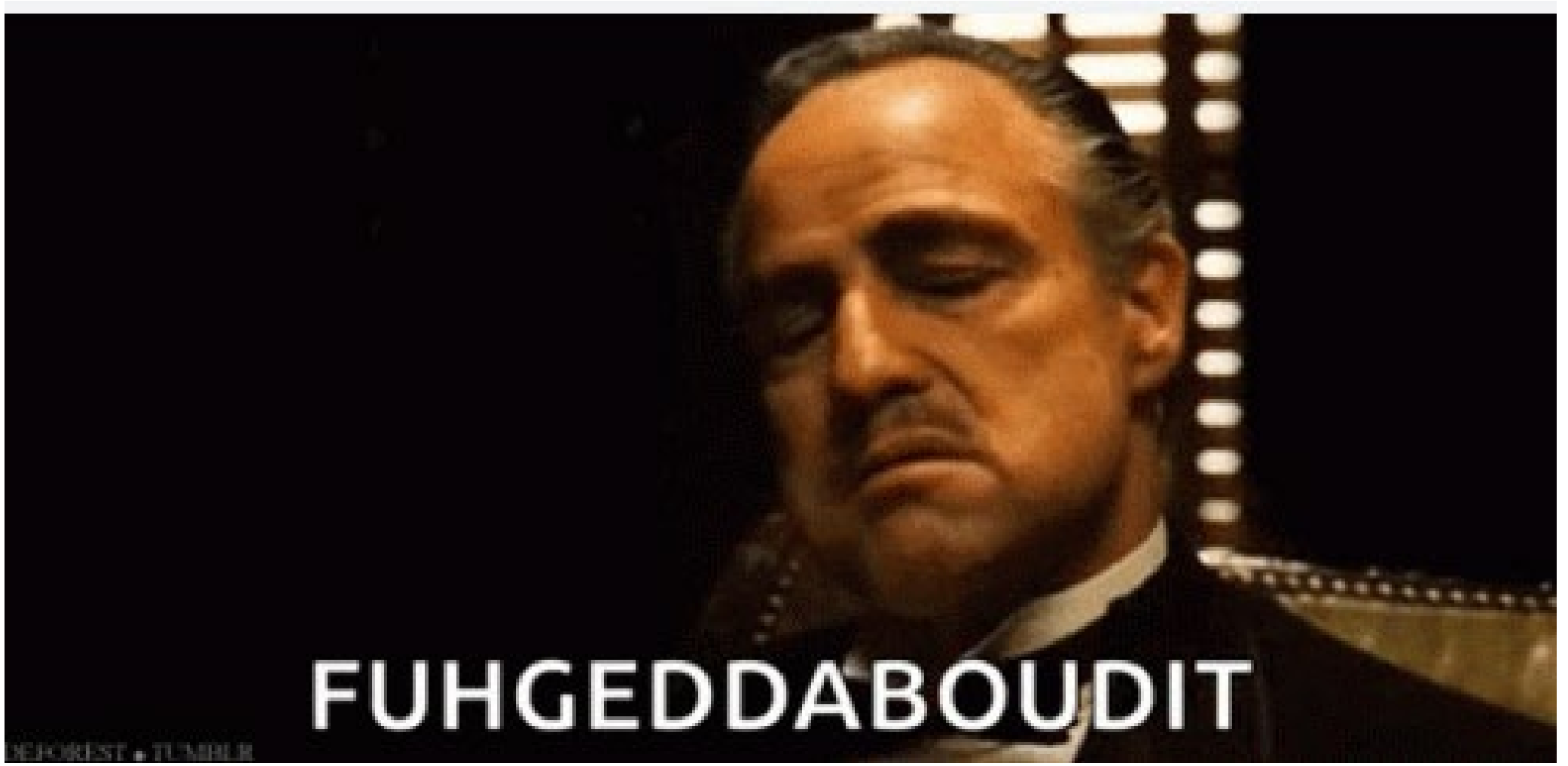
https://goldcopd.org/2024-gold-report/

COPD Diagnosis and Treatment

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

California URGENT CARE ASSOCIATION

COPD Diagnosis and Treatment



COPD Diagnosis and treatment

- Diagnosis is based on how much air can you exhale in 1 second (FEV1/FVC)
- Staging is based on comparing you to a peer
- TREATMENT – is based on two factors – what GOLD calls "Treatable Traits"
- The traits are exacerbation and symptoms

Review

- COPD is widespread and largely underdiagnosed, flares are frequent
- Most are tobacco related but there are others
- In Urgent Care consider this even if they don't have a diagnosis, most wont.
- You need spirometry to get the diagnosis and stage of COPD
- But the stage DOES NOT equal quality of life, life expectancy and does not affect treatment decisions.
- Now you want to know –
- How are you?
- How often are you sick?

For Reference

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.

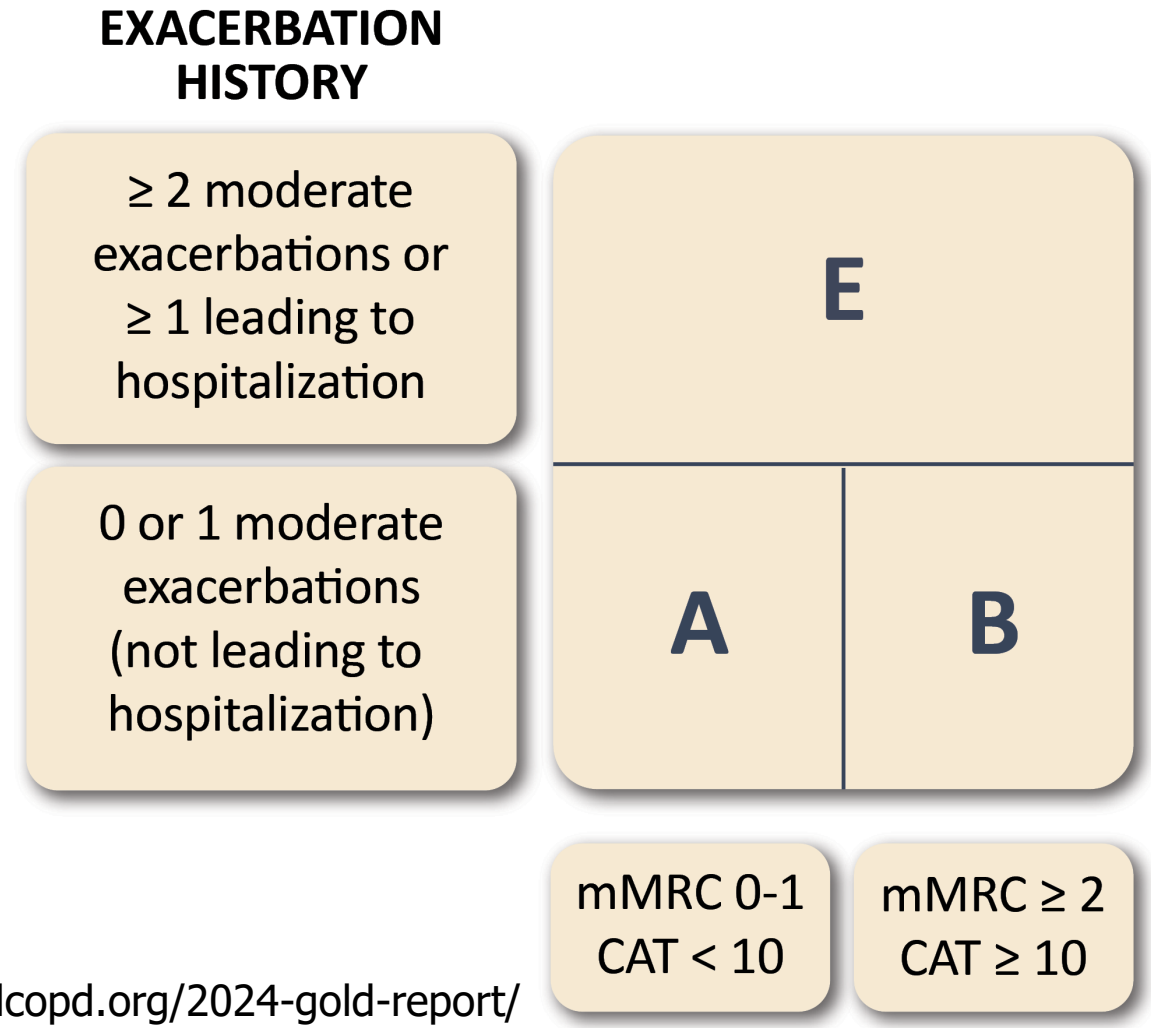
EXAMPLE: I am very happy	0 (X) 2 3 4 5	**I am very sad**	**SCORE**
I never cough	0 1 2 3 4 5	I cough all the time	
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	
When I walk 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: ( )

California URGENT CARE ASSOCIATION

GOLD 2024 Treatment Guidelines



https://goldcopd.org/2024-gold-report/

GOLD 2024 Treatment Guidelines

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

GROUP A

A bronchodilator

mMRC 0-1, CAT < 10

GOLD 2024 Treatment Guidelines

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

GROUP B

LABA + LAMA*

mMRC ≥ 2, CAT ≥ 10

GOLD 2024 Treatment Guidelines

≥ 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

GOLD 2024 Treatment Guidelines

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	**GROUP E** **LABA + LAMA*** *consider LABA+LAMA+ICS* if blood eos ≥ 300*	
0 or 1 moderate exacerbations (not leading to hospital admission)	**GROUP A** **A bronchodilator** mMRC 0-1, CAT < 10	**GROUP B** **LABA + LAMA*** mMRC ≥ 2, CAT ≥ 10

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

2024 Respiratory Treatments

Allergy & Asthma Network

800.878.4403 • AllergyAsthmaNetwork.org

Allergy & Asthma Network is a national nonprofit organization dedicated to ending needless death and suffering due to asthma, allergies and related conditions through outreach, education, advocacy and research.

American College of Allergy, Asthma & Immunology

VIATRIS

Theravance Biopharma

DOSE INDICATOR
G = GENERIC AVAILABLE
N = NEBULIZER VIAL
DISEASE STATES:
A = ASTHMA
C = COPD

SHORT-ACTING BETA$_2$-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

- **Albuterol Sulfate Inhalation Solution** — 0.63, 1.5, 2.5 mg; 3 mL — G N
- **ProAir® Digihaler™** — 90 mcg — albuterol sulfate inhalation powder — 1 2 3 A
- **ProAir RespiClick®** — 90 mcg — albuterol sulfate inhalation powder — 1 2 3 A
- **Proventil® HFA** — 90 mcg — albuterol sulfate — 1 2 3 A G
- **Ventolin® HFA** — 90 mcg — albuterol sulfate — 1 2 3 A G
- **Xopenex®** — 0.31, 0.63, 1.25 mg; 3 mL — levalbuterol hydrochloride inhalation solution — A G N
- **Xopenex HFA®** — 45 mcg — levalbuterol tartrate — A G

LONG-ACTING BETA$_2$-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

- **Brovana®** — 15 mg; 2 mL — arformoterol tartrate inhalation solution — C N
- **Perforomist®** — 20 mcg; 2 mL — formoterol fumarate inhalation solution — C N
- **Serevent® Diskus®** — 50 mcg — salmeterol xinafoate inhalation powder — 1 2 A C
- **Striverdi® Respimat®** — 2.5 mcg — olodaterol hydrochloride — 1 2 C

INHALED CORTICOSTEROIDS

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

- **Alvesco® HFA** — 80, 160 mcg — ciclesonide — 1 2 3 A
- **ArmonAir® Digihaler™** — 55, 113, 232 mcg — fluticasone propionate inhalation powder — 1 2 3 A
- **Arnuity® Ellipta®** — 50, 100, 200 mcg — fluticasone furoate inhalation powder — 1 2 3 A
- **Asmanex® HFA** — 50, 100, 200 mcg — mometasone furoate — 1 2 3 A
- **Asmanex® Twisthaler®** — 110, 220 mcg — mometasone furoate inhalation powder — 1 2 3 A
- **Fluticasone Propionate Diskus Inhalation Powder** — 50, 100, 250 mcg — Approved generic of Flovent Diskus — 1 2 3 A
- **Fluticasone Propionate HFA** — 44, 110, 220 mcg — Approved generic of Flovent HFA — 1 2 3 A
- **Pulmicort Flexhaler®** — 90, 180 mcg — budesonide inhalation powder — 1 2 A
- **Pulmicort Respules®** — 0.25, 0.50, 1.0 mg; 2 mL — budesonide inhalation suspension — A G N
- **QVAR® Redihaler™** — 40, 80 mcg — beclomethasone dipropionate — 1 2 3 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 — 1 2 3 C
- **Ipratropium Bromide Inhalation Solution** — 0.5, 2.5 mg; 2.5 mL — C G N

LONG-ACTING

- **Incruse® Ellipta®** — 62.5 mcg — umeclidinium inhalation powder — 1 2 3 C
- **Spiriva® HandiHaler®** — 18 mcg — tiotropium bromide inhalation powder — C
- **Spiriva® Respimat®** — 1.25, 2.5 mcg — tiotropium bromide — 1 2 3 A C
- **Tudorza™ Pressair™** — 400 mcg — aclidinium bromide inhalation powder — 1 2 3 C
- **Yupelri®** — 17.5 mcg; 3 mL — revefenacin inhalation solution — C N

PDE4 INHIBITORS

target lung inflammation and reduce exacerbations

- **Daliresp®** — 250, 500 mcg — roflumilast — C

COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta$_2$-agonist (LABA)

- **Advair Diskus®** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol inhalation powder — 1 2 3 A C G
- **Advair® HFA** — 45/21, 115/21, 230/21 mcg — fluticasone propionate and salmeterol xinafoate — 1 2 3 A G
- **AirDuo® Digihaler™** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — 1 2 3 A
- **AirDuo® RespiClick®** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — 1 2 3 A G
- **Breo® Ellipta®** — 50/25, 100/25, 200/25 mcg — fluticasone furoate and vilanterol inhalation powder — 1 2 3 A C G
- **Breyna™** — 80/4.5, 160/45 mcg — Budesonide and formoterol fumarate dihydrate (approved generic of Symbicort) — 1 2 3 A C
- **Dulera®** — 50/5, 100/5, 200/5 mcg — mometasone furoate and formoterol fumarate dihydrate — 1 2 3 A
- **Symbicort®** — 80/4.5, 160/4.5 mcg — budesonide and formoterol fumarate dihydrate — 1 2 3 A C G
- **Wixela™ Inhub™** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol xinafoate (approved generic of Advair Diskus) — 1 2 3 A C

contain both long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Anoro® Ellipta®** — 62.5/25 mcg — umeclidinium and vilanterol inhalation powder — 1 2 3 C
- **Bevespi Aerosphere®** — 9/4.8 mcg — glycopyrrolate and formoterol fumarate — 1 2 3 C
- **Duaklir® Pressair®** — 400, 12 mcg — aclidinium bromide and formoterol fumarate — 1 2 3 C
- **Stiolto™ Respimat®** — 2.5/2.5 mcg — tiotropium bromide and olodaterol — 1 2 3 C

contain inhaled corticosteroid, long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Trelegy® Ellipta®** — 200/62.5/25 mcg, 100/62.5/25 mcg — fluticasone furoate, umeclidinium and vilanterol inhalation powder — 1 2 3 A C
- **Breztri Aerosphere™** — 160/9/4.8 mcg — budesonide, glycopyrrolate and formoterol fumarate — 1 2 3 C

contain both short-acting beta$_2$-agonist and short-acting muscarinic antagonist

- **Combivent® Respimat®** — 20/100 mcg — ipratropium bromide and albuterol — 1 2 3 C
- **Ipratropium Bromide and Albuterol Sulfate Inhalation Solution** — 2.5 mg; 3 mL — C G

contain inhaled corticosteroid and short-acting beta$_2$-agonist (SABA)

- **AirSupra®** — 80, 90 mcg — budesonide and albuterol — 1 2 3 A

BIOLOGICS

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

- **Cinqair®** — 62.5/25 mL — reslizumab — A
- **Dupixent®** — 100, 200, 300 mg — dupilumab — A
- **Fasenra™** — 30 mg — benralizumab — A
- **Nucala®** — 100 mg — mepolizumab — A
- **Tezspire™** — 210 mg — tezepelumab-ekko — A
- **Xolair®** — 75 to 375 mg — omalizumab — A

LEUKOTRIENE MODIFIERS

block chemicals called leukotrienes that cause airway inflammation; available as tablet or granules

- **Singulair®** — 4, 5, 10 mg — montelukast — A
- **Zafirlukast** — 10, 20 mg — zafirlukast — A
- **Zyflo CR®** — 600 mg — zileuton — A

Why not Inhaled Steroids?

GROUP E

LABA + LAMA*

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

If not needed don't use them!

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

Fluticasone causes the most URIs

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 [1], Yuejun Du [1], Hong Chen [1], Depeng Jiang [2], Zhibo Xu [3]

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 incorporatedthat 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.

Should Inhaled Steroids be used?

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[#]**
	≥ 2 moderate exacerbations of COPD per year[#]
	Blood eosinophils ≥ 300 cells/µL
	History of, or concomitant asthma
FAVORS USE	1 moderate exacerbation of COPD per year[#]
	Blood eosinophils 100 to < 300 cells/µL
AGAINST USE	**Repeated pneumonia events**
	Blood eosinophils < 100 cells/µL
	History of mycobacterial infection

[#]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.

Review

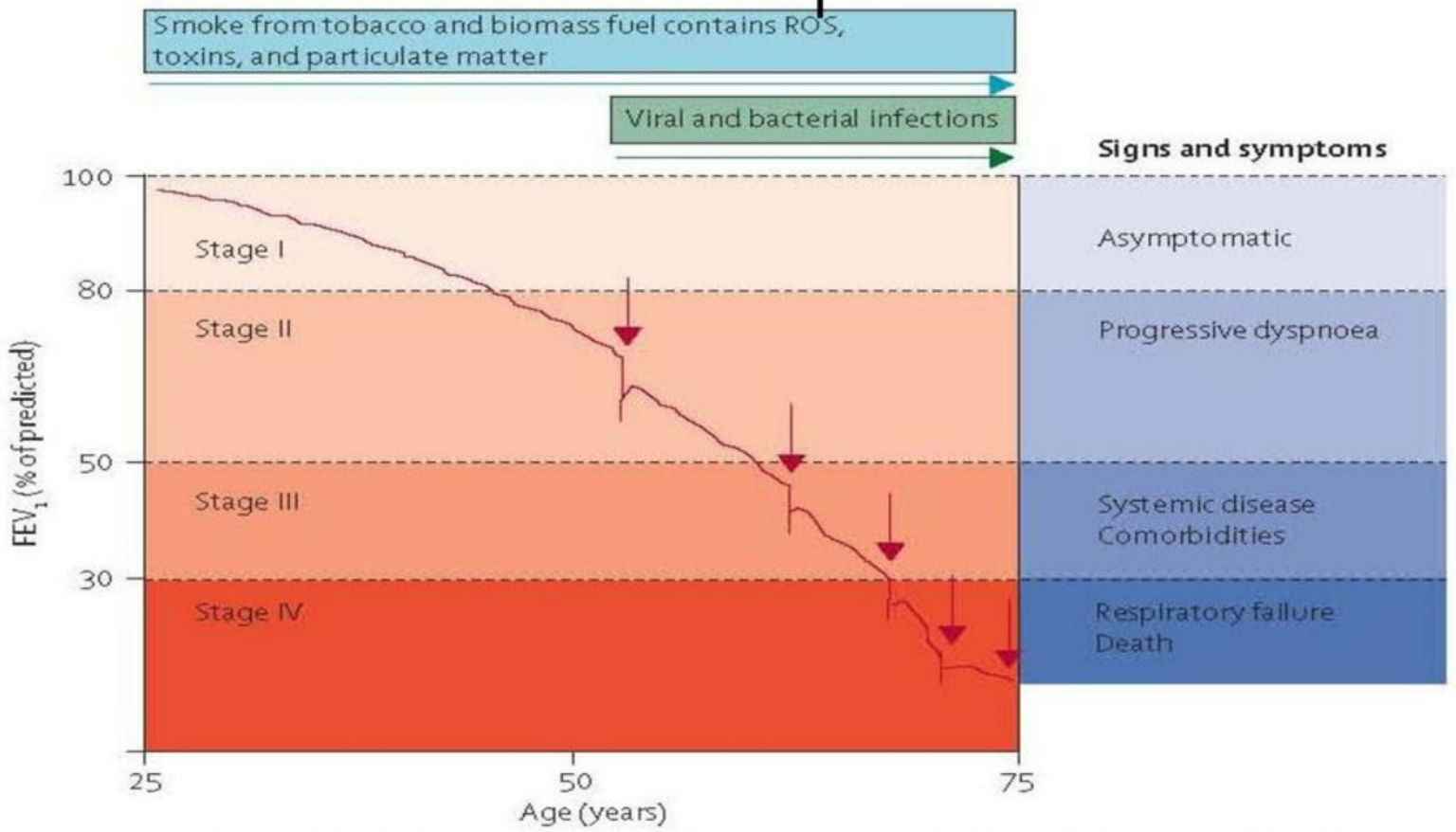
- Outpatient therapy for COPD is determined by the number and frequency of exacerbations and overall symptom assessment. How sick? How are you?
- Most will do well on a LAMA/LABA. That is your go-to most of the time
- Inhaled steroids have significant s/e and concerns (2X risk of all URI and pneumonia), the benefits outweigh the negatives for patients with asthma and/or those with eosinophils over 300 and in general, for those with severe disease and controlling inflammation is one of the final steps – for all of these a triple inhaler is reasonable.
- UC providers have a SIGNIFICANT role in helping COPD patients get on the correct inhaler, helping them get set up to STAY WELL after we help them GET WELL!
- What about this getting them well. . . . . the exacerbation!

GOLD #1 Goal is Exacerbation Treatment and Prevention

- **Exacerbations are not “bumps” in the road like they are for asthma**
- **Moderate to severe exacerbations are life altering, patients never recover fully.**
- **An exacerbation is an acute change in a patient's baseline dyspnea, cough, or sputum that is beyond normal variability, and that is sufficient to warrant a change in therapy.**

GOLD 2024 Treatment Guidelines

COPD exacerbations & Effect on FEV_1



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

COPD Exacerbation Definition

An exacerbation of chronic obstructive pulmonary disease (ECOPD) is defined as an event characterized by increased dyspnea and/or cough and sputum that worsens in < 14 days which may be accompanied by tachypnea and/or tachycardia and is often associated with increased local and systemic inflammation caused by infection, pollution, or other insult to the airways.[304]

https://goldcopd.org/2024-gold-report/

COPD Exacerbation Definition

Practically – Patients present with an increase in medication use, an increase in cough, sputum increase and/or change in color. And the key is that they came in to see you.

“My inhalers don’t work”

“I can’t breathe”

“Chest is tight”

“Using my nebulizer more”

All of these strongly support that an intervention is needed.

Considerations for the Exacerbation Patient

Most frequent	**Pneumonia** • Chest radiograph **Pulmonary embolism** • Clinical probability assessment (Hemoptysis, surgery, fracture, history of cancer, DVT) • D-dimer • CT angiography for pulmonary embolism **Heart failure** • Chest radiograph • NT Pro-Brain Natriuretic Peptide (Pro-BNP) and BNP • Echocardiography
Less frequent	**Pneumothorax, pleural effusion** • Chest radiograph • Thoracic ultrasound **Myocardial infarction and/or cardic arrhythmias (atrial fibrillation/flutter)** • Electrocardiography • Troponin

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COPD Exacerbation Diagnosis

1.	Complete a thorough clinical assessment for evidence of COPD and potential respiratory and non-respiratory concomitant diseases, including consideration of alternative causes for the patient's symptoms and signs: primarily pneumonia, heart failure, and pulmonary embolism.
2.	**Assess:** a. Symptoms, severity of dyspnea that can be determined by using a VAS, and documentation of the presence of cough. b. Signs (tachypnea, tachycardia), sputum volume and color, and respiratory distress (accessory muscle use).
3.	Evaluate severity by using appropriate additional investigations such as pulse oximetry, laboratory assessment, CRP, arterial blood gases.
4.	Establish the cause of the event (viral, bacterial, environmental, other).

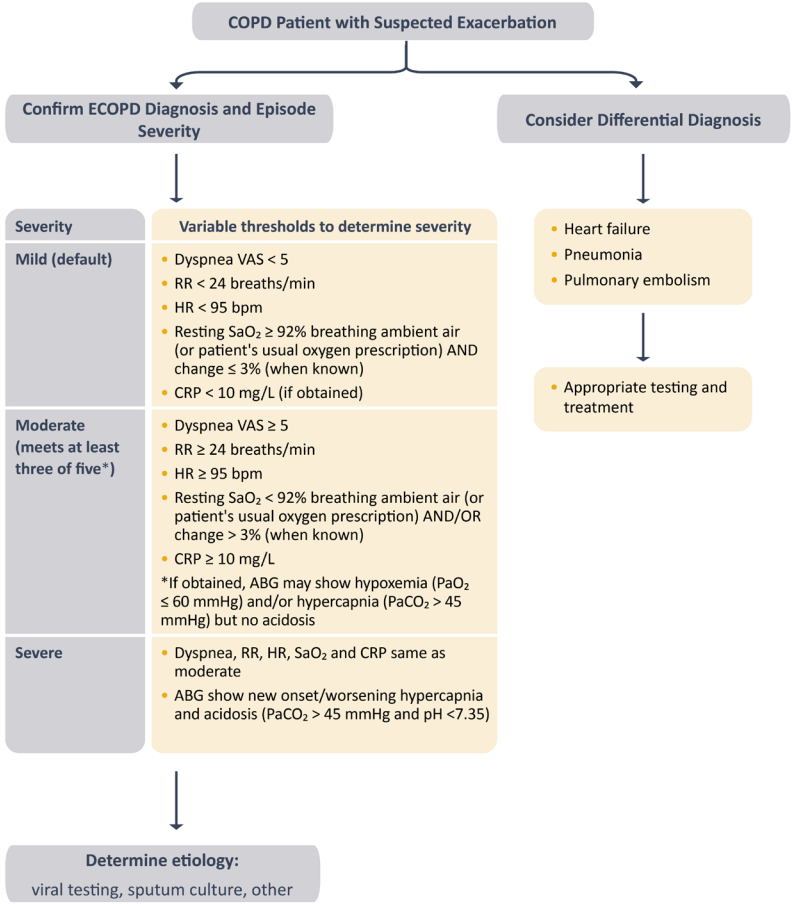
Abbreviations: COPD = chronic obstructive pulmonary disease; CRP = C-reactive protein; VAS = visual analog scale.

https://goldcopd.org/2024-gold-report/

Exacerbation Severity Assessment

Classification of the Severity of COPD Exacerbations

Figure 4.3



Severity	Variable thresholds to determine severity
Mild (default)	• Dyspnea VAS < 5 • RR < 24 breaths/min • HR < 95 bpm • Resting SaO_2 ≥ 92% breathing ambient air (or patient's usual oxygen prescription) AND change ≤ 3% (when known) • CRP < 10 mg/L (if obtained)
Moderate (meets at least three of five*)	• Dyspnea VAS ≥ 5 • RR ≥ 24 breaths/min • HR ≥ 95 bpm • Resting SaO_2 < 92% breathing ambient air (or patient's usual oxygen prescription) AND/OR change > 3% (when known) • CRP ≥ 10 mg/L *If obtained, ABG may show hypoxemia (PaO_2 ≤ 60 mmHg) and/or hypercapnia ($PaCO_2$ > 45 mmHg) but no acidosis
Severe	• Dyspnea, RR, HR, SaO_2 and CRP same as moderate • ABG show new onset/worsening hypercapnia and acidosis ($PaCO_2$ > 45 mmHg and pH <7.35)

Adapted from: The ROME Proposal, Celli et al. (2021) Am J Respir Crit Care Med. 204(11): 1251-8.

Abbreviations: VAS visual analog dyspnea scale; RR respiratory rate; HR heart rate; SaO_2 oxygen saturation; CRP C-reactive protein; ABG arterial blood gases; PaO_2 Arterial pressure of oxygen.

Exacerbation Severity Assessment

Severity	Variable thresholds to determine severity
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Considerations for Hospitalization.

- Severe symptoms such as sudden worsening of resting dyspnea, high respiratory rate, decreased oxygen saturation, confusion, drowsiness
- Acute respiratory failure
- Onset of new physical signs (e.g., cyanosis, peripheral edema)
- Failure of an exacerbation to respond to initial medical management
- Presence of serious comorbidities (e.g., heart failure, newly occurring arrhythmias, etc.)
- Insufficient home support

*Local resources need to be considered

Exacerbation Treatment in the UC

- Short-acting inhaled beta$_2$-agonists, with or without short-acting anticholinergics, are recommended as the initial bronchodilators to treat an acute exacerbation **(Evidence C)**
- Systemic corticosteroids can improve lung function (FEV1), oxygenation and shorten recovery time and hospitalization duration. Duration of therapy should not normally be more than 5 days **(Evidence A)**
- Antibiotics, when indicated, can shorten recovery time, reduce the risk of early relapse, treatment failure, and hospitalization duration. Duration of therapy should normally be 5 days **(Evidence B)**
- Methylxanthines are not recommended due to increased side effect profiles **(Evidence B)**
- Non-invasive mechanical ventilation should be the first mode of ventilation used in COPD patients with acute respiratory failure who have no absolute contraindication because it improves gas exchange, reduces work of breathing and the need for intubation, decreases hospitalization duration and improves survival **(Evidence A)**

Why Nebulizers?

Respiratory Medicine 161 (2020) 105857

Contents lists available at ScienceDirect

Respiratory Medicine

journal homepage: http://www.elsevier.com/locate/rmed

Review article

The role of inspiratory flow in selection and use of inhaled therapy for patients with chronic obstructive pulmonary disease

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ARTICLE INFO

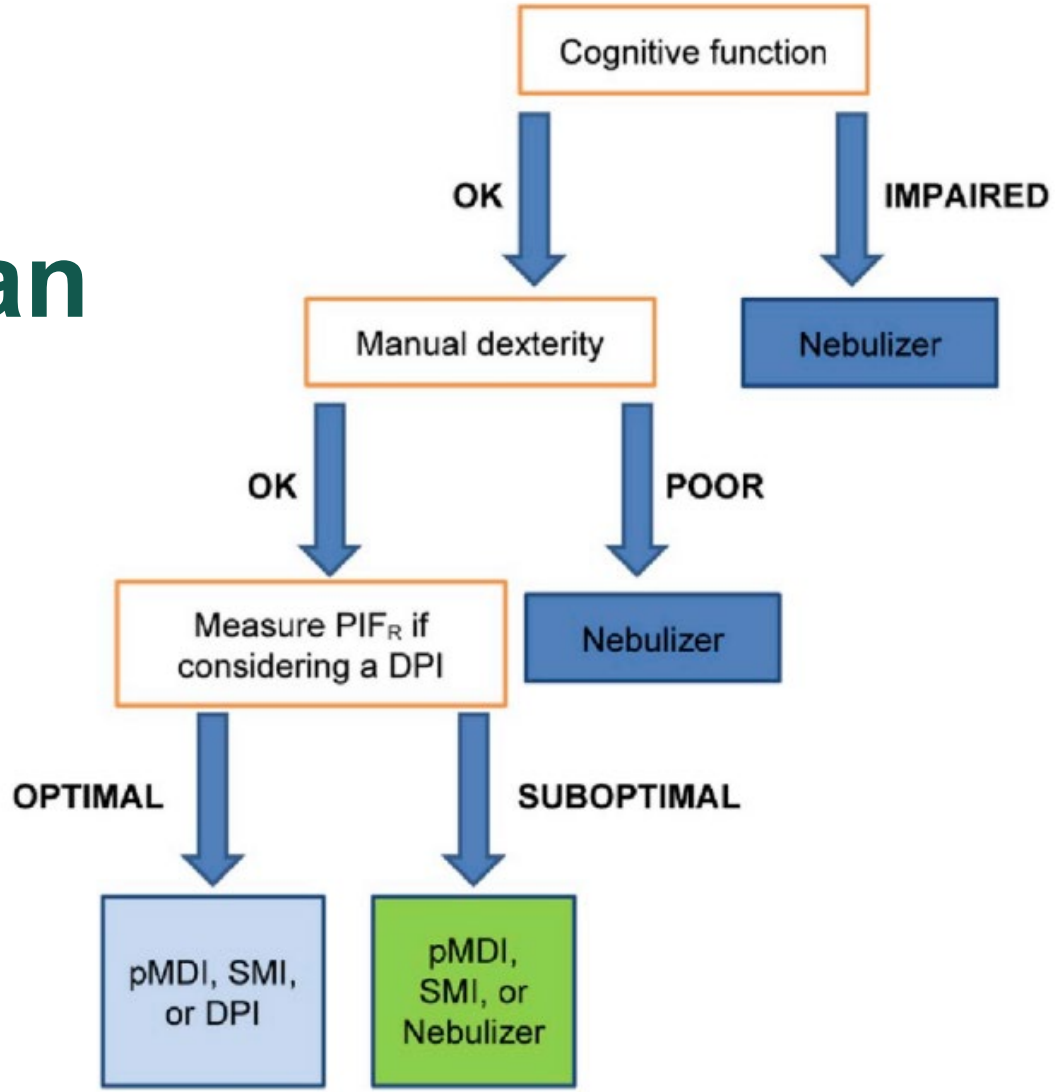
Keywords:
Chronic obstructive pulmonary disease
Hand-held inhalers
Inhalation technique
Inspiratory flow
Peak inspiratory flow

ABSTRACT

Inhalation therapy is the mainstay of chronic obstructive pulmonary disease management, and inhaler selection can have a profound impact on drug delivery and medication adherence, as well as on treatment outcomes. Although multiple delivery systems, such as pressurized metered-dose inhalers, dry powder inhalers, slow-mist inhalers, and nebulizers, are available, clinical benefits achieved by patients rely on effective delivery of the inhaled medication to the airways. Among several factors influencing drug deposition, inspiratory flow is one of the most important. Inspiratory flow impacts drug delivery and subsequent clinical efficacy, making it necessary to adequately train patients to ensure correct inhaler use. Peak inspiratory flow is the maximal airflow generated during a forced inspiratory maneuver. Health care professionals need to select the appropriate delivery system after carefully considering patient characteristics, including lung function, optimal inspiratory flow, manual dexterity, and cognitive function. Herein, the role of inspiratory flow in the selection and use of inhaled therapy in patients with COPD is reviewed.

Why Nebulizers?

Do what you can in the UC, but if you can ask about this you may do more to help them than any medication



Why Nebulizers?

- Measure this with an In-Check Device
- 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?

*Barjaktarevic IZ, Milstone AP. Nebulized Therapies in COPD: Past, Present, and the Future. Int J Chron Obstruct Pulmon Dis. 2020 Jul 12;15:1665-1677. doi: 10.2147/COPD.S252435. PMID: 32764912; PMCID: PMC7367939.
** No data to support this whatsoever, but I like it.

For Reference about Azithromycin

Review > Rev Med Virol. 2021 Mar;31(2):e2163. doi: 10.1002/rmv.2163. Epub 2020 Sep 23.

Azithromycin in viral infections

Madeleine E Oliver [1], Timothy S C Hinks [2]

Affiliations + expand

PMID: 32969125 PMCID: PMC7536932 DOI: 10.1002/rmv.2163

Abstract

Azithromycin (AZM) is a synthetic macrolide antibiotic effective against a broad range of bacterial and mycobacterial infections. Due to an additional range of anti-viral and anti-inflammatory properties, it has been given to patients with the coronaviruses SARS-CoV or MERS-CoV. It is now being investigated as a potential candidate treatment for SARS-CoV-2 having been identified as a candidate therapeutic for this virus by both in vitro and in silico drug screens. To date there are no randomised trial data on its use in any novel coronavirus infection, although a large number of trials are currently in progress. In this review, we summarise data from in vitro, murine and human clinical studies on the anti-viral and anti-inflammatory properties of macrolides, particularly AZM. AZM reduces in vitro replication of several classes of viruses including rhinovirus, influenza A, Zika virus, Ebola, enteroviruses and coronaviruses, via several mechanisms. AZM enhances expression of anti-viral pattern recognition receptors and induction of anti-viral type I and III interferon responses. Of relevance to severe coronavirus-19 disease (COVID-19), which is characterised by an over-exuberant innate inflammatory response, AZM also has anti-inflammatory properties including suppression of IL-1beta, IL-2, TNF and GM-CSF. AZM inhibits T cells by inhibiting calcineurin signalling, mammalian target of rapamycin activity and NFκB activation. AZM particularly targets granulocytes where it concentrates markedly in lysosomes, particularly affecting accumulation, adhesion, degranulation and apoptosis of neutrophils. Given its proven safety, affordability and global availability, tempered by significant concerns about antimicrobial stewardship, there is an urgent mandate to perform well-designed and conducted randomised clinical trials.

Keywords: COVID-19; SARS-CoV-2; azithromycin; coronavirus; macrolide; mechanism; review; virus.

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Exacerbation Treatment in the UC

- **Inhalers/Nebulizers – Make sure they have them, review use. SVN if any doubt about ability. Duoneb best SVN, Combivent best rescue inhaler. Have them dose based on TIME, not symptoms, till the steroids kick in, usually 24 hours. Q4H while awake, at noc if they get up.**
- **Limit? None. Do what is needed to break through. But if >3 and not getting better then come in. Don't have to do the entre SVN.**

Exacerbation Treatment in the UC

- PO Prednisone (cheaper) – 40mg for 3 days, 20mg for 2 days. Take QD, dose in the AM if possible. Warn of s/e, glucose.
- PO Azithromycin for MOST. 500mg QD x 1 day then 250 mg QD x 4 days.
- Both are QD for 5 days, compliance is high, cost low.
- May do a patient-controlled taper – 40mg QD till they feel about half better then 20mg QD till close to baseline. No data on this.
- Tessalon? Sure, what does this do anyway?
- Mucinex DM

Exacerbation Treatment in the UC

- If you can, talk with them about cost/refills. Help them by refilling chronic COPD medications if you are comfortable doing so.
- AstraZeneca has a cap of $35 on inhalers for non-insured patients
- Keep an inhaler and a soft-mist inhaler with you at work, wash the actuator part and let them show you how they do it. More than half are using it wrong. PROMISE.
- GET them better, then help them STAY better. Be a Superstar!

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For Reference All COPD Medications – including nebulized

Commonly Used Maintenance Medications in COPD*

Table 3.3

Generic Drug Name	Inhaler Type	DELIVERY OPTIONS: Nebulizer	Oral	Injection	Duration of Action
$BETA_2$-Agonists					
Short-acting (SABA)					
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
Long-acting (LABA)					
Arformoterol		✓			12 hours
Formoterol	DPI	✓			12 hours
Indacaterol	DPI				24 hours
Olodaterol	SMI				24 hours
Salmeterol	MDI & DPI				12 hours
Anticholinergics					
Short-acting (SAMA)					
Ipratropium bromide	MDI	✓			6-8 hours
Oxitropium bromide	MDI				7-9 hours
Long-acting (LAMA)					
Aclidinium 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
Combination Short-Acting $Beta_2$-Agonist Plus Anticholinergic in One Device (SABA+SAMA)					
Fenoterol/ipratropium	SMI	✓			6-8 hours
Salbutamol/ipratropium	SMI, MDI	✓			6-8 hours
Combination Long-Acting $Beta_2$-Agonist Plus Anticholinergic in One Device (LABA+LAMA)					
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
Methylxanthines					
Aminophylline			solution	✓	Variable, up to 24 hours
Theophylline (SR)			pill	✓	Variable, up to 24 hours
Combination of Long-Acting $Beta_2$-Agonist Plus Corticosteroid in One Device (LABA+ICS)					
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
Triple Combination in One Device (LABA+LAMA+ICS)					
Fluticasone/umeclidinium/vilanterol	DPI				24 hours
Beclometasone/formoterol/glycopyrronium	MDI, DPI				12 hours
Budesonide/formoterol/glycopyrrolate	MDI				12 hours
Phosphodiesterase-4 Inhibitors					
Roflumilast			pill		24 hours
Mucolytic Agents					
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.

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For Reference Smoking Cessation

<< Previous article Mar 15, 2021 Issue Next article >>

Practice Guidelines

Medications for Smoking Cessation: Guidelines from the American Thoracic Society

Reference

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

Author disclosure: No relevant financial affiliations.

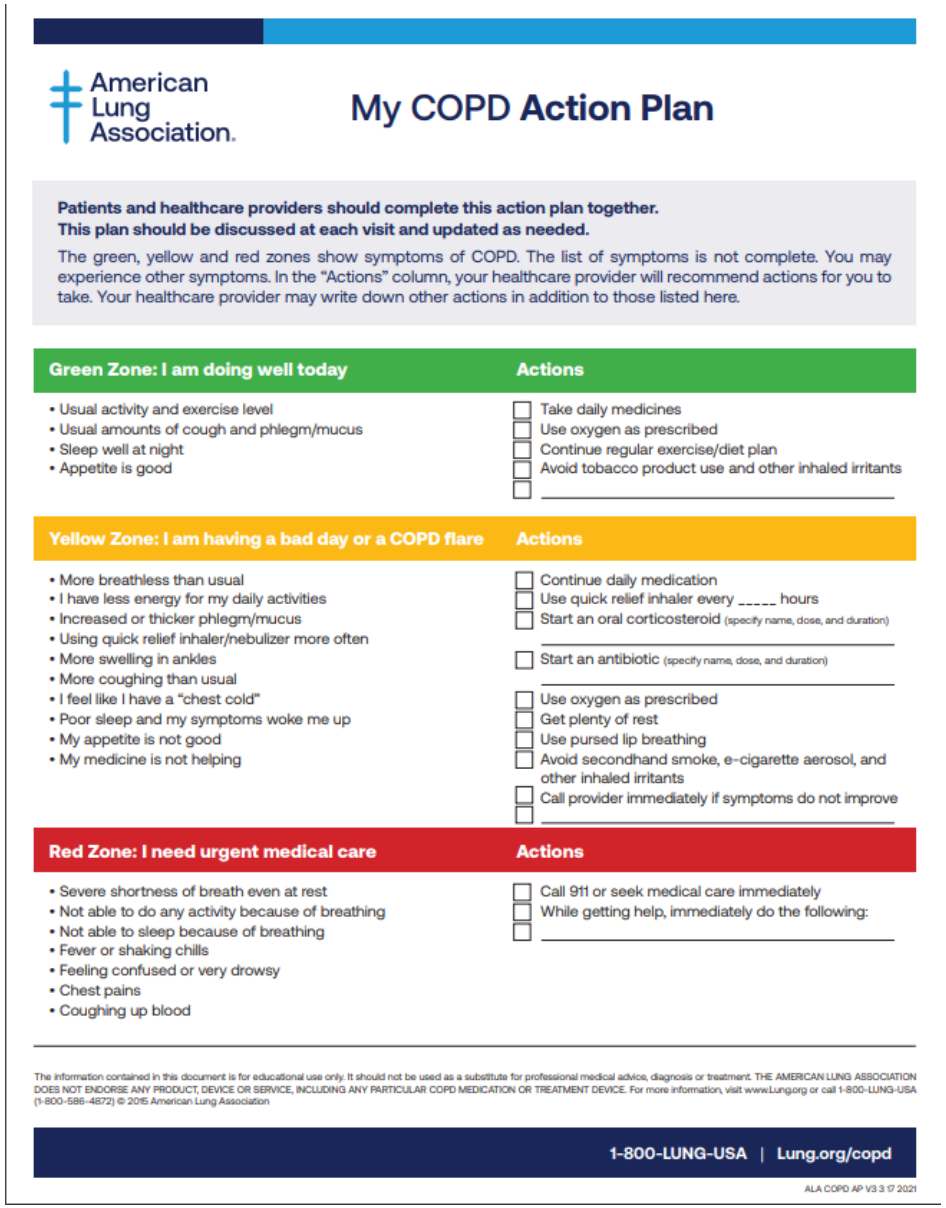
Key Points for Practice

- 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

For Reference COPD Action Plan

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



American Lung Association.

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.

Green Zone: I am doing well today	Actions
• Usual activity and exercise level • Usual amounts of cough and phlegm/mucus • Sleep well at night • Appetite is good	☐ 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	Actions
• 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	☐ 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	Actions
• 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	☐ Call 911 or seek medical care immediately ☐ While getting help, immediately do the following: ☐ _____

1-800-LUNG-USA | Lung.org/copd

ALA COPD AP V3 3 17 2021

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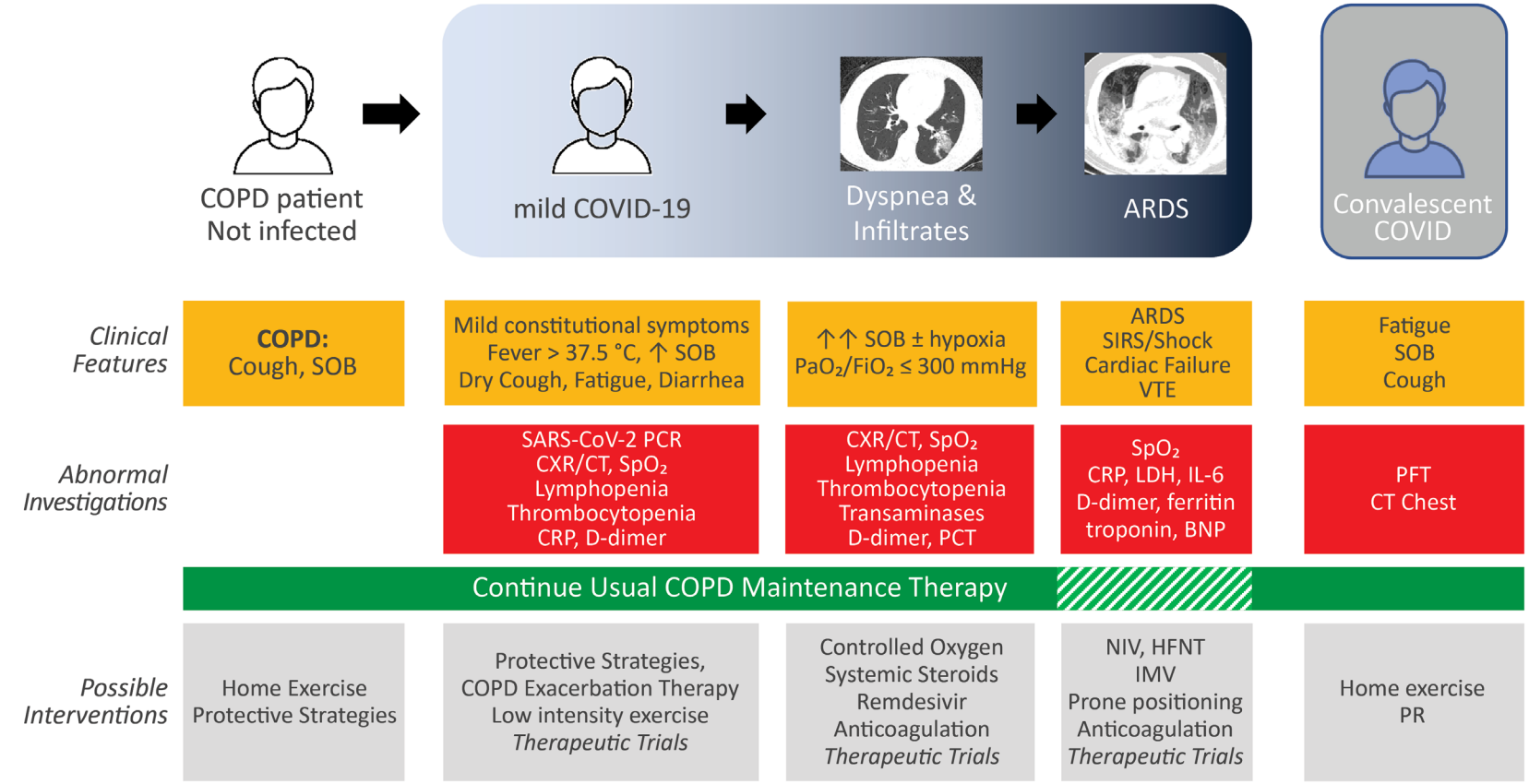
For Reference COPD and COVID

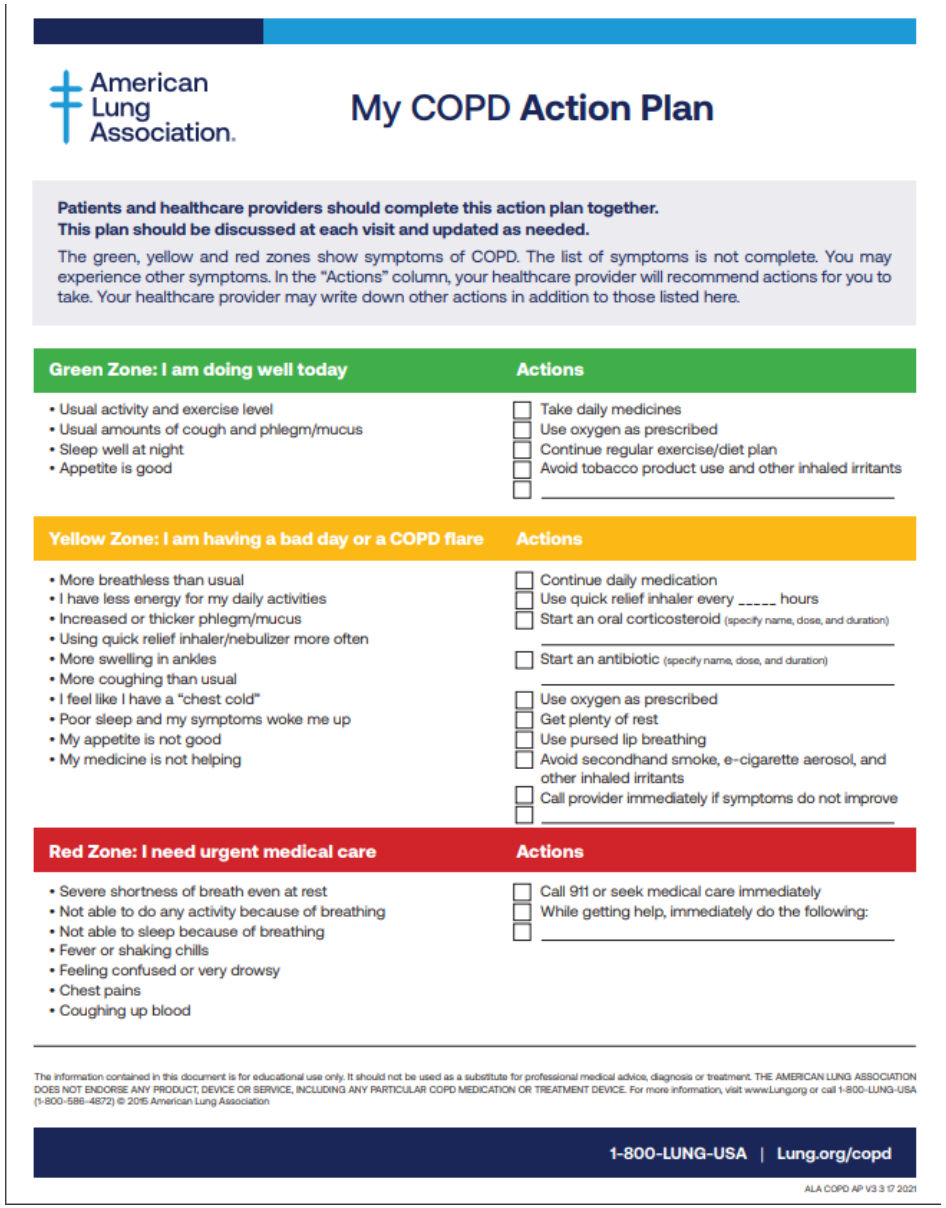


(ARDS, Adult respiratory distress syndrome; BNP, brain natriuretic peptide; CRP, C reactive protein; CT, computed tomography; CXR, chest radiograph; HFNT, high flow nasal therapy; IL-6, interleukin 6; IMV, invasive mechanical ventilation; LDH, lactate dehydrogenase; NIV, non-invasive ventilation; PCT, procalcitonin; PFT, pulmonary function tests; PR, pulmonary rehabilitation; SOB, Shortness of breath; SpO_2 , peripheral oxygen saturation; VTE, venous thromboembolism)

Halpin et al. 2020. Global Initiative for the Diagnosis, Management, and Prevention of Chronic Obstructive Lung Disease: The 2020 GOLD Science Committee Report on COVID-19 & COPD. Published Ahead of Print: https://www.atsjournals.org/doi/abs/10.1164/rccm.202009-3533SO
The American Journal of Respiratory and Critical Care Medicine is an official journal of the American Thoracic Society

For Reference

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



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