Asthma 2024
The State of the State of Asthma: Guidelines and Changes
AAPA 2024 – Houston, Texas

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Boise Downtown – image just down from my house

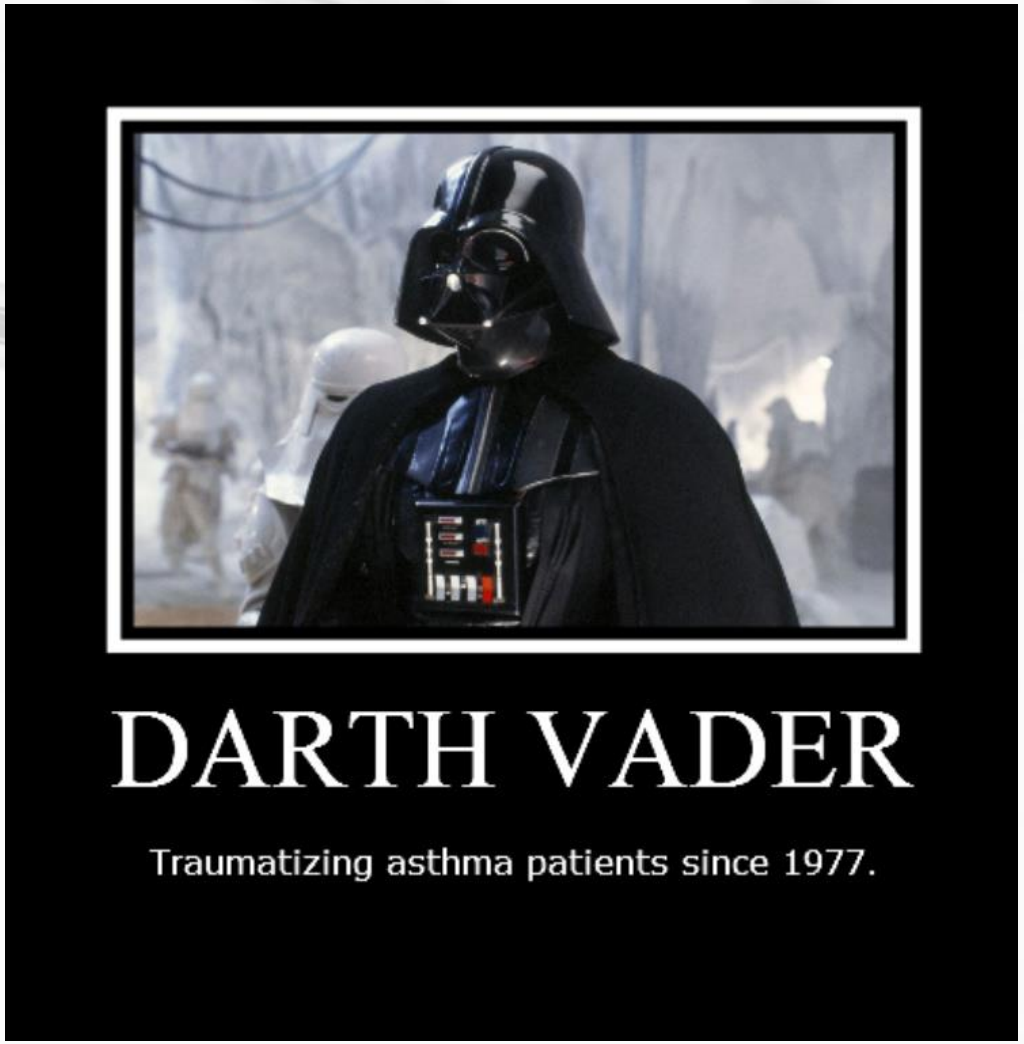
Disclosures

INDUSTRY AFFILIATIONS
Grifols Pharmaceutical - speaker, consultant
AstraZeneca – advisory board
Regeneron – advisory board

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).

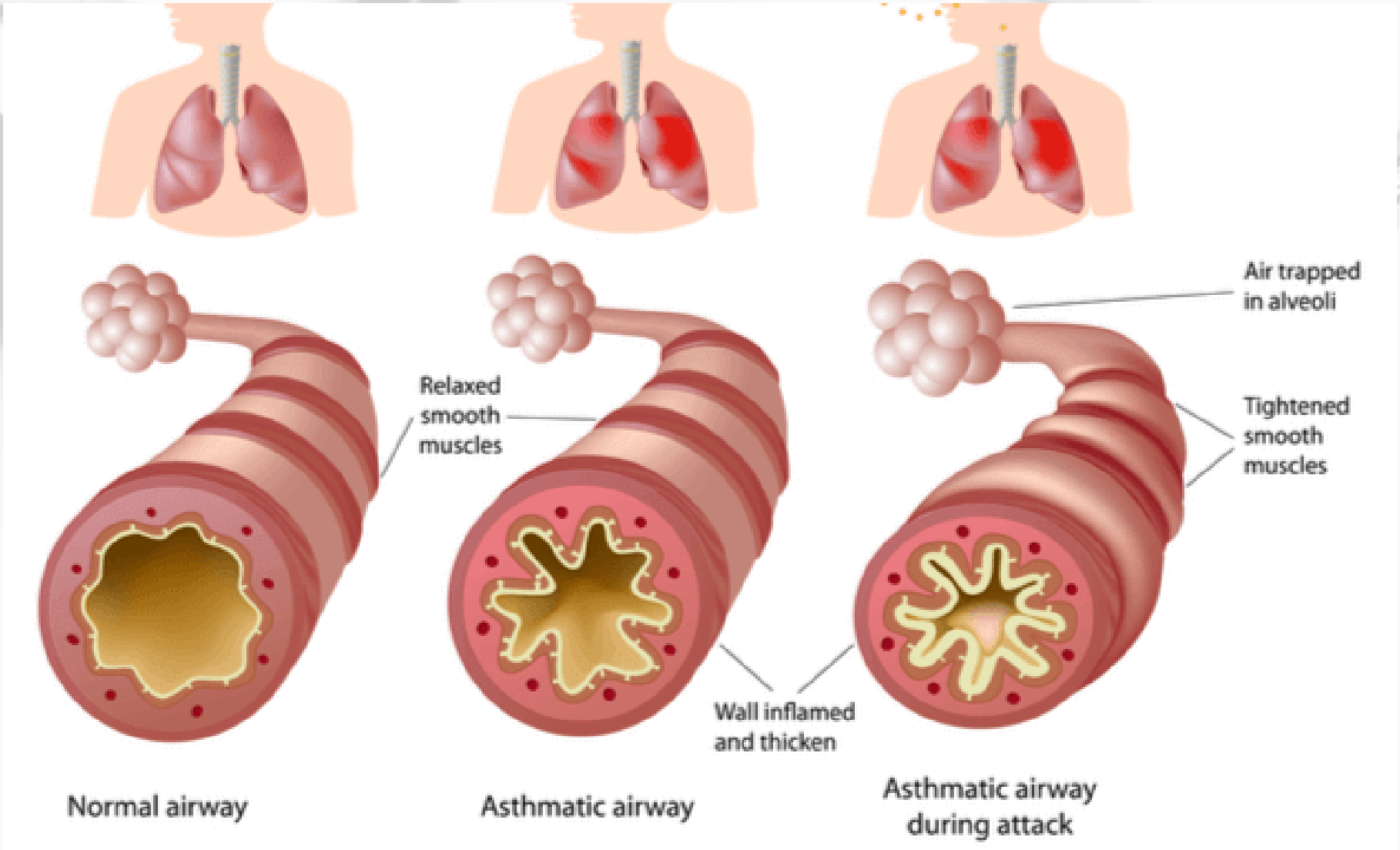
- **Review medication classes for asthma, new inhalers**
- **Talk over the guidelines, focus on the changes that you must know**
- **Some tips for personalized respiratory care/exacerbations**



Plan For Today

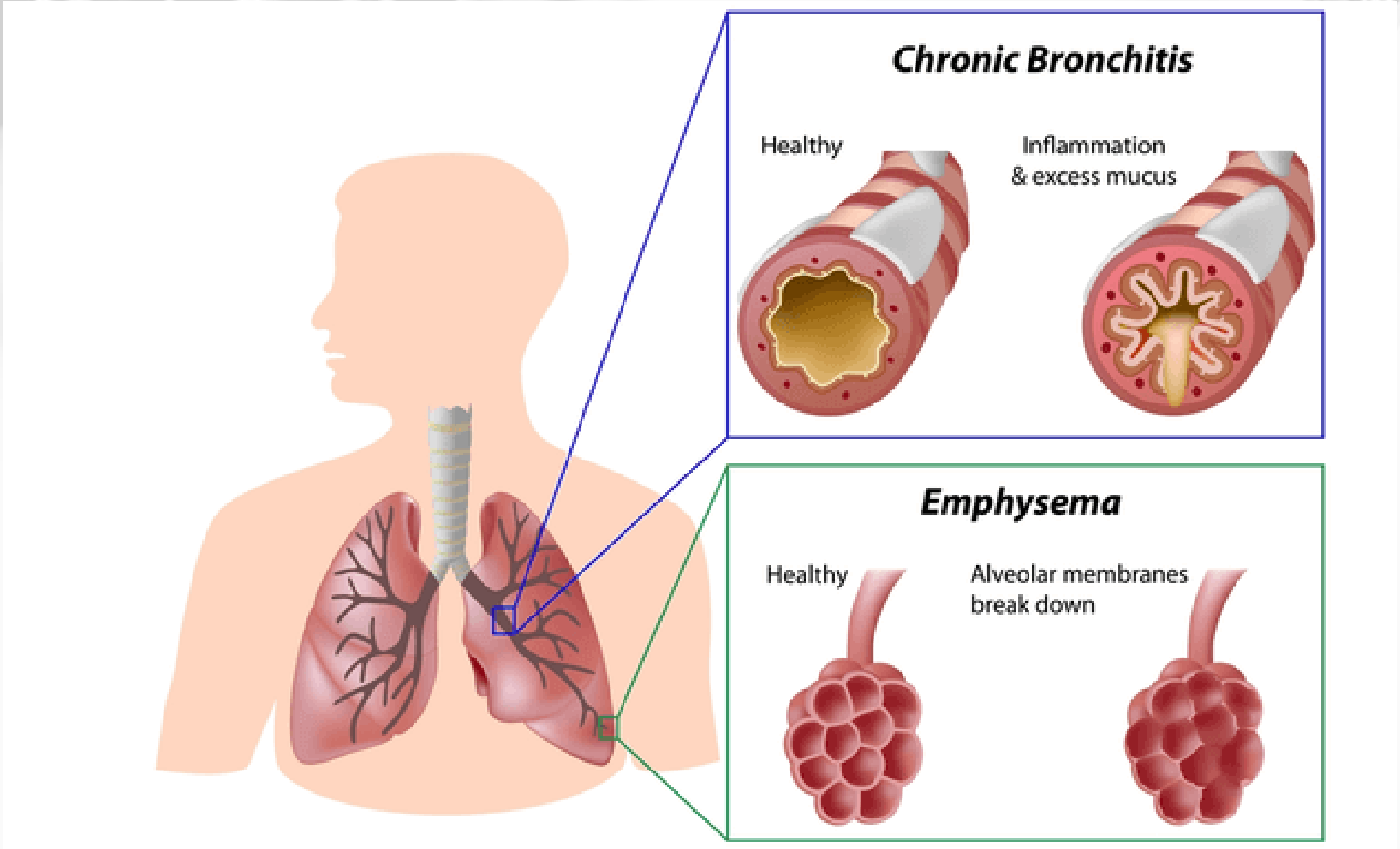
Asthma and COPD

- **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 – Think of the name. . A chronic disease with permanent and pervasive obstruction



Respiratory medications:
We have 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

Code for English Inhalers

Code for Spanish Inhalers

2024 Respiratory Treatments

Allergy & Asthma Network

American College of Allergy, Asthma & Immunology

VIATRIS

Theravance Biopharma

DOSE INDICATOR = 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 — albuterol sulfate inhalation solution — G N
- **ProAir® Digihaler™** — 90 mcg — albuterol sulfate inhalation powder — DOSE INDICATOR 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 INDICATOR A
- **Asmanex® HFA** — 50, 100, 200 mcg — mometasone furoate — DOSE A
- **Asmanex® Twisthaler®** — 110, 220 mcg — mometasone furoate inhalation powder — DOSE INDICATOR 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 INDICATOR 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 — 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®** — 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
- **Wixela™ Inhub™** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol xinafoate (approved generic of Advair Diskus) — DOSE INDICATOR 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 INDICATOR 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 inhaled short-acting beta$_2$-agonist (SABA) 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 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:
We have three categories of medications

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

DRK = 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 — DRK A
- **ProAir RespiClick®** — 90 mcg — albuterol sulfate inhalation powder — DRK A
- **Proventil® HFA** — 90 mcg — albuterol sulfate — DRK A G
- **Ventolin® HFA** — 90 mcg — albuterol sulfate — DRK 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 — DRK A C
- **Striverdi® Respimat®** — 2.5 mcg — olodaterol hydrochloride — DRK 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 — DRK A
- **ArmonAir® Digihaler™** — 55, 113, 232 mcg — fluticasone propionate inhalation powder — DRK A
- **Arnuity® Ellipta®** — 50, 100, 200 mcg — fluticasone furoate inhalation powder — DRK A
- **Asmanex® HFA** — 50, 100, 200 mcg — mometasone furoate — DRK A
- **Asmanex® Twisthaler®** — 110, 220 mcg — mometasone furoate inhalation powder — DRK A
- **Fluticasone Propionate Diskus Inhalation Powder** — 50, 100, 250 mcg — Approved generic of Flovent Diskus — DRK A
- **Fluticasone Propionate HFA** — 44, 110, 220 mcg — Approved generic of Flovent HFA — DRK A
- **Pulmicort Flexhaler®** — 90, 180 mcg — budesonide inhalation powder — DRK 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 — DRK 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 — DRK C

LONG-ACTING

- **Incruse® Ellipta®** — 62.5 mcg — umeclidinium inhalation powder — DRK 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 — DRK A C
- **Tudorza™ Pressair™** — 400 mcg — aclidinium bromide inhalation powder — DRK 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 — DRK A C G
- **Advair® HFA** — 45/21, 115/21, 230/21 mcg — fluticasone propionate and salmeterol xinafoate — DRK A G
- **AirDuo® Digihaler™** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DRK A
- **AirDuo® RespiClick®** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DRK A G
- **Breo® Ellipta®** — 50/25, 100/25, 200/25 mcg — fluticasone furoate and vilanterol inhalation powder — DRK A C G
- **Breyna™** — 80/4.5, 160/45 mcg — budesonide and formoterol fumarate dihydrate (approved generic of Symbicort) — DRK A C
- **Dulera®** — 50/5, 100/5, 200/5 mcg — mometasone furoate and formoterol fumarate dihydrate — DRK A
- **Symbicort®** — 80/4.5, 160/4.5 mcg — budesonide and formoterol fumarate dihydrate — DRK A C G
- **Wbeta™ Inhub™** — 100/50, 250/50, 500/50 mcg — fluticasone propionate and salmeterol xinafoate (approved generic of Advair Diskus) — DRK 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 — DRK C
- **Bevespi Aerosphere®** — 9/4.8 mcg — glycopyrrolate and formoterol fumarate — DRK C
- **Duaklir® Pressair®** — 400, 12 mcg — aclidinium bromide and formoterol fumarate — DRK C
- **Stiolto™ Respimat®** — 2.5/2.5 mcg — tiotropium bromide and olodaterol — DRK 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 — DRK A C
- **Breztri Aerosphere™** — 160/9/4.8 mcg — budesonide, glycopyrrolate and formoterol fumarate — DRK C

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

- **Combivent® Respimat®** — 20/100 mcg — ipratropium bromide and albuterol — DRK 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 — DRK 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:
We have three categories of medications

SAMA/LAMA

Short – SAMA
Long – LAMA

Anticholinergic and constriction prevention

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.

American College of Allergy, Asthma & Immunology

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DOSE INDICATOR = DOSE INDICATOR
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DISEASE STATES:
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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 — A
- **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
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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

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

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- **Pulmicort Flexhaler®** — 90, 180 mcg — budesonide inhalation powder — DOSE — A
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- **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
- **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 — DOSE — C
- **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

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

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- **Ipratropium Bromide and Albuterol Sulfate Inhalation Solution** — 2.5 mg; 3 mL — C G

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BIOLOGICS

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

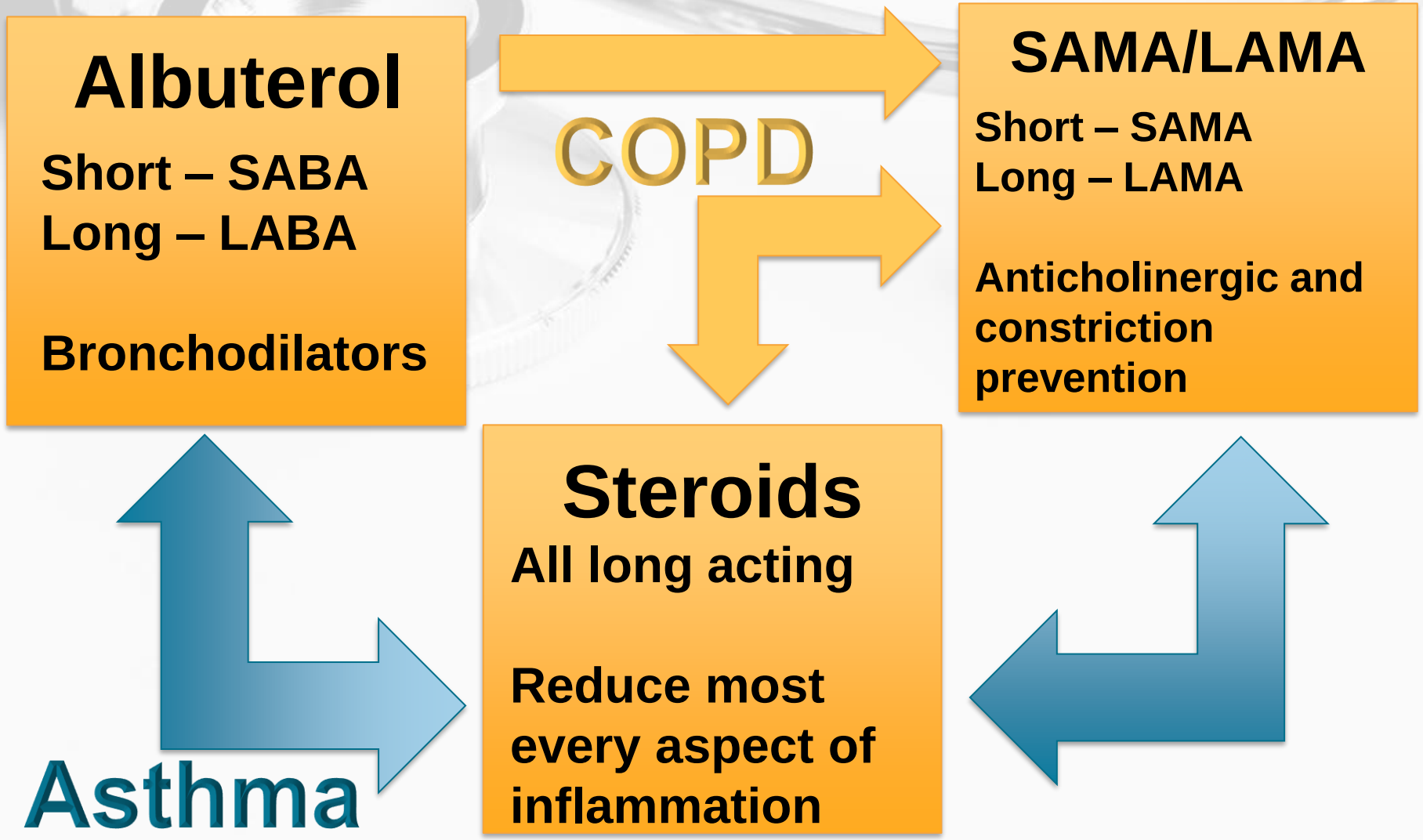
- **Cinqair®** — 62.5/25 mL — reslizumab — A
- **Dupixent®** — 100, 200, 300 mg — dupilumab — A
- **Fasenra™** — 30 mg — benralizumab — A
- **Nucala®** — 100 mg — mepolizumab — A
- **Tezspire™** — 210 mg — tezepelumab-ekko — A
- **Xolair®** — 75 to 375 mg — omalizumab — A

LEUKOTRIENE MODIFIERS

block chemicals ... illed leukotrienes that cause airway ... able as tablet or granules

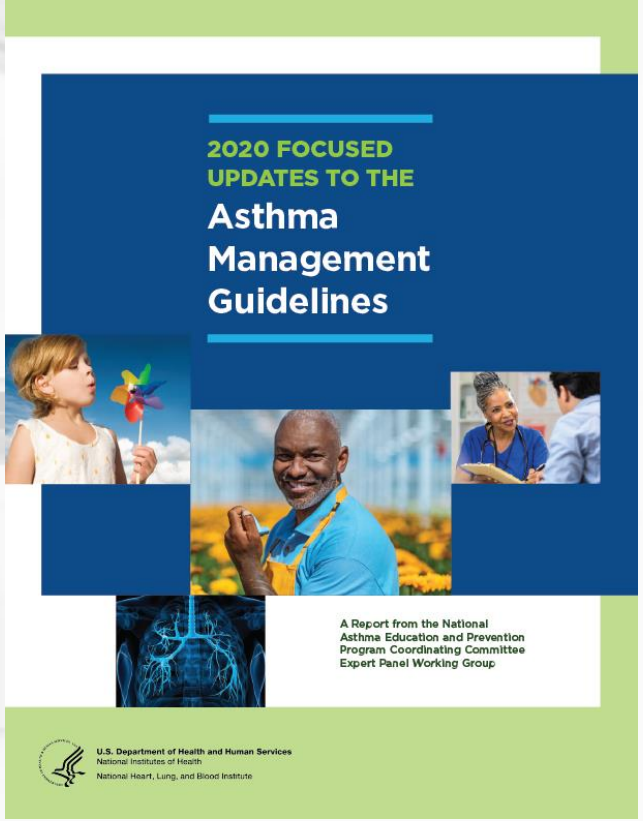
- **Singulair®** — 4, 5, 10 mg — montelukast — A
- **Zafirlukast** — 10, 20 mg — zafirlukast — A
- **Zyflo CR®** — 600 mg — zileuton — A

Respiratory medications:
We have three categories of medications



Asthma Guidelines

2020 US Guidelines get a partial "focused" update



30 GLOBAL INITIATIVE FOR ASTHMA 1993-2023

• Proud to be celebrating the 30th year of GINA •

GINA – the rest of the world has GINA, the Global Initiative for Asthma, updated every year

Definition of asthma

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation, bronchoconstriction and increased mucous production.

It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and intensity, together with variable expiratory airflow limitation.

Key change #1 – *Albuterol use*

Inhaled SABA has been first-line treatment for asthma for 50 years

This dates from an era when asthma was thought to be a disease of bronchoconstriction

- **Patients rely on albuterol, it's fast, it's what they can feel working**
- **But albuterol just RELAXES constriction**
- **Over reliance on albuterol is dangerous and far from good asthma control. Albuterol does not CONTROL asthma**
- **Over-use of albuterol reduces receptors, increases how allergens and smoke effects the lungs.**
- **Over prescription of albuterol is the single most consistent factor when looking at asthma admissions and death.**

Key change #1 – *Albuterol use*

- **For safety, GINA no longer recommends SABA-only treatment for Step 1**
  - **This decision was based on evidence that SABA-only treatment increases the risk of severe exacerbations, and that adding any ICS significantly reduces the risk**

- **GINA now recommends that all adults and adolescents with asthma should receive symptom-driven or regular low dose ICS-containing controller treatment, to reduce the risk of serious exacerbations**

- **US Guidelines recommend this in STEP 2**

Key change #1 – *Albuterol use*

- **In response we now have a combination inhaler on the market.**
- **Albuterol with a steroid – in this case it's budesonide.**

Key change #2 – *PRN long-acting beta agonist and steroid*

- **S**ingle **M**aintenance **A**nd **R**eliever **T**herapy
- Remember, albuterol is fast – on fast, off fast
- There is one LABA that is fast as well, formoterol
- So it's fast and long acting
- Combine this with the best inhaled steroid, budesonide and you have an excellent controller – long acting asthma control
- But what about using this PRN?
- It's as fast as albuterol, lasts 12 hours?
- Can this be a CONTROLLER and RESCUE?

Meta-Analysis > Eur Respir J. 2020 Sep 10;56(3):2000625. doi: 10.1183/13993003.00625-2020. Print 2020 Sep.

SMART and as-needed therapies in mild-to-severe asthma: a network meta-analysis

Paola Rogliani [1 2], Beatrice Ludovica Ritondo [1], Josuel Ora [2], Mario Cazzola [1], Luigino Calzetta [1]

Affiliations + expand

PMID: 32430423 DOI: 10.1183/13993003.00625-2020

Free article

Abstract

To date, there are no network meta-analyses comparing the impact of as-needed treatments in asthma, including the single maintenance and reliever therapy (known as "SMART" or "MART"; for simplicity, SMART will be used hereafter) and the use of inhaled corticosteroid (ICS)/long-acting β_2-agonist (LABA) combination exclusively on an as-needed basis. Therefore, we performed a systematic review and network meta-analysis concerning the efficacy and safety of SMART and as-needed therapies in asthma. Data from 32 096 asthmatic patients were extracted from 21 studies, lasting from 6 to 12 months. In adult mild-to-moderate asthmatic patients low-dose SMART and as-needed low-dose ICS/LABA combination were significantly (relative effect <0.78; $p<0.05$) more effective than the other as-needed therapies in reducing the risk of exacerbation, and both were ranked as the first treatment option reaching the first quartile of the surface under the cumulative ranking curve analysis (SUCRA). In adult moderate-to-severe asthmatic patients, low-dose to medium-dose SMART and high-dose ICS/LABA+as-needed short-acting β_2-agonist were equally effective in reducing the risk of severe asthma exacerbation ($p>0.05$), although only low- to medium-dose SMART was ranked as the first treatment option (first SUCRA quartile). Overall, these treatments were well tolerated, and effective also on lung function and disease control. This study supports SMART and as-needed therapies as a suitable therapeutic option for asthma, by providing the most effective positioning of each specific treatment according to the disease severity.

Key changes – *SMART THERAPY*

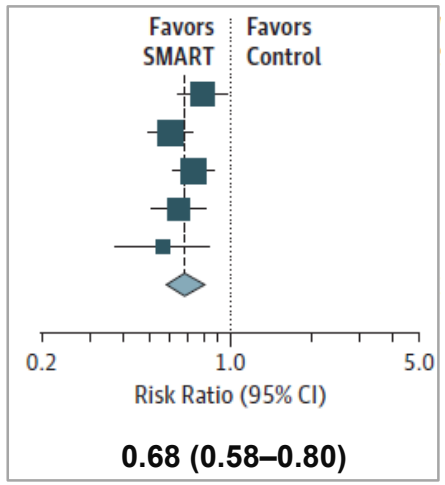
Single Maintenance And Reliever Therapy (GINA calls this MART)

This is NOT FDA approved but is recommended in all guideline based therapy

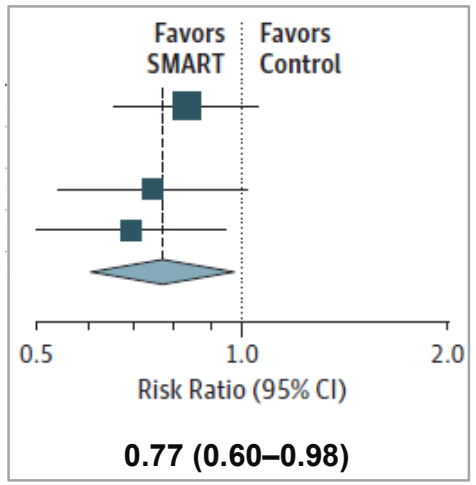
Very reasonable to try this, just document the medical decision making and that the patient has not had severe acute exacerbations, MILD TO MODERATE ASTHMA

Track 1, Steps 3–5: Maintenance and reliever therapy (MART)

- MART with ICS-formoterol reduces severe exacerbations compared with ICS or ICS-LABA plus SABA reliever, with similar symptom control
  - Confirmed by regulatory studies and pragmatic open-label studies, n~30,000
- Both budesonide and formoterol contribute to the reduction in severe exacerbations

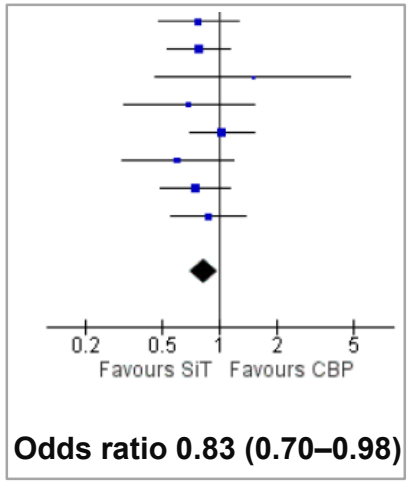


Compared with same dose ICS-LABA +SABA



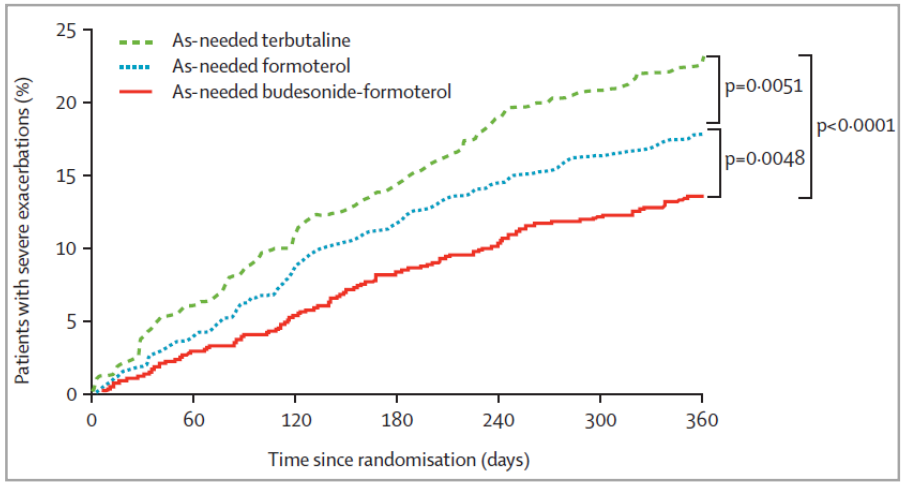
Compared with higher dose ICS-LABA + SABA

Sobieraj et al, JAMA 2018 (n=22,748)



Compared with conventional best practice

Cates et al, Cochrane 2013 (n=4,433)



Compared with formoterol or SABA reliever

Rabe, Lancet 2006
N=3,395, all taking maintenance budesonide-formoterol

Step	Age (years)	Medication and device (check patient can use inhaler)	Metered dose (mcg/inhalation)	Delivered dose (mcg/inhalation)	Dosage
Steps 1–2 (AIR-only)	6–11	(No evidence)	-	-	-
	12–17 ≥18	Budesonide-formoterol DPI	200/6	160/4.5	**1 inhalation whenever needed**

DPI: dry powder inhaler; pMDI: pressurized metered dose inhaler. For budesonide-formoterol pMDI with 3 mcg [2.25 mcg] formoterol, use double number of puffs

Step	Age (years)	Medication and device (check patient can use inhaler)	Metered dose (mcg/inhalation)	Delivered dose (mcg/inhalation)	Dosage
Steps 1–2 (AIR-only)	6–11	(No evidence)	-	-	-
	12–17 ≥18	Budesonide-formoterol DPI	200/6	160/4.5	**1 inhalation whenever needed**
Step 3 MART	6–11	Budesonide-formoterol DPI	100/6	80/4.5	**1 inhalation once daily**, PLUS 1 inhalation whenever needed
	12–17 ≥18	Budesonide-formoterol DPI	200/6	160/4.5	**1 inhalation once or twice daily,** PLUS 1 inhalation whenever needed
	≥18	BDP-formoterol pMDI	100/6	84.6/5.0	

DPI: dry powder inhaler; pMDI: pressurized metered dose inhaler. For budesonide-formoterol pMDI with 3 mcg [2.25 mcg] formoterol, use double number of puffs

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Step 4 MART	6–11	Budesonide-formoterol DPI	100/6	80/4.5	**1 inhalation twice daily**, PLUS 1 inhalation whenever needed
	12–17 ≥18	Budesonide-formoterol DPI	200/6	160/4.5	**2 inhalations twice daily**, PLUS 1 inhalation whenever needed
	≥18	BDP-formoterol pMDI	100/6	84.6/5.0	

DPI: dry powder inhaler; pMDI: pressurized metered dose inhaler. For budesonide-formoterol pMDI with 3 mcg [2.25 mcg] formoterol, use double number of puffs

Step	Age (years)	Medication and device (check patient can use inhaler)	Metered dose (mcg/inhalation)	Delivered dose (mcg/inhalation)	Dosage
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	≥18	BDP-formoterol pMDI	100/6	84.6/5.0	
Step 5 MART	6–11	(No evidence)	-	-	-
	12–17 ≥18	Budesonide-formoterol DPI	200/6	160/4.5	**2 inhalations twice daily**, PLUS 1 inhalation whenever needed
	≥18	BDP-formoterol pMDI	100/6	84.6/5.0	

DPI: dry powder inhaler; pMDI: pressurized metered dose inhaler. For budesonide-formoterol pMDI with 3 mcg [2.25 mcg] formoterol, use double number of puffs

Reliever doses of ICS-formoterol - how much can be taken?

- For ICS-formoterol with 6 mcg (4.5 mcg delivered dose) of formoterol, take **1 inhalation** whenever needed for symptom relief
- Another inhalation can be taken after a few minutes if needed
- Maximum total number of inhalations in any single day (as-needed + maintenance)
  - **Budesonide-formoterol**: maximum 12 inhalations* for adults, 8 inhalations for children, based on extensive safety data *(Tattersfield et al, Lancet 2001; Pauwels et al, ERJ 2003)*
  - **Beclometasone-formoterol**: maximum total 8 inhalations in any day *(Papi et al, Lancet Respir Med 2013)*
- Emphasize that most patients need far fewer doses than this!

- For pMDIs containing 3 mcg formoterol (2.25 mcg delivered dose), take 2 inhalations each time

**For budesonide-formoterol 200/6 [delivered dose 160/4.5 mcg], 12 inhalations gives 72 mcg formoterol (54 mcg delivered dose)*

Practical advice for GINA Track 1

- At first, patients may be unsure whether ICS-formoterol will work as well as their previous SABA reliever
  - In the PRACTICAL study, 69% patients said ICS-formoterol worked as fast as, or faster than, their previous SABA *(Baggott et al, ERJ 2020)*
  - Suggest to the patient that they try out the new reliever at a convenient time
  - Emphasise that they should use the ICS-formoterol **instead of** their previous SABA, and that they should take an additional inhalation when they have more symptoms

Supplement to Reddel et al, JACI in Practice 2022; 10: S31-s38

This template can be modified for other ICS-formoterol combinations or for as-needed-only ICS-formoterol.
The action plan on which it is based has been widely used in Australia and other countries since 2007.

My Asthma Action Plan

For Single Inhaler Maintenance and Reliever Therapy (SMART)
with budesonide/formoterol

Name: _____ Action plan provided by: _____

Date: _____ Doctor: _____

Usual best PEF: _____ L/min *(if used)* Doctor's phone: _____

Normal mode

My SMART Asthma Treatment is:

☐ budesonide/formoterol 160/4.5 (12 years or older)

☐ budesonide/formoterol 80/4.5 (4-11 years)

My Regular Treatment Every Day:

(Write in or circle the number of doses prescribed for this patient)

Take [1, 2] inhalation(s) in the morning

and [0, 1, 2] inhalation(s) in the evening, every day

Reliever

Use 1 inhalation of budesonide/formoterol whenever needed for relief of my asthma symptoms

I should always carry my budesonide/formoterol inhaler

My asthma is stable if:

- I can take part in normal physical activity without asthma symptoms

AND

- I do not wake up at night or in the morning because of asthma

Other Instructions

_____

_____

Asthma Flare-up

If over a Period of 2-3 Days:

- My asthma symptoms are getting worse **OR NOT** improving

OR

- I am using more than 6 budesonide/formoterol reliever inhalations a day (if aged 12 years or older) or more than 4 inhalations a day (if aged 4-11 years)

I should:

☒ Continue to use my regular everyday treatment **PLUS** 1 inhalation budesonide/formoterol whenever needed to relieve symptoms

☐ Start a course of prednisolone

☐ Contact my doctor

Course of Prednisolone Tablets:

Take _____mg prednisolone tablets

per day for _____days **OR**

_____

_____

If I need more than **12 budesonide/formoterol inhalations (total)** in any day (or more than 8 inhalations for children 4-11 years), I **MUST** see my doctor or go to the hospital the same day.

Asthma Emergency

Signs of an Asthma Emergency:

- Symptoms getting worse quickly
- Extreme difficulty breathing or speaking
- Little or no improvement from my budesonide/formoterol reliever inhalations

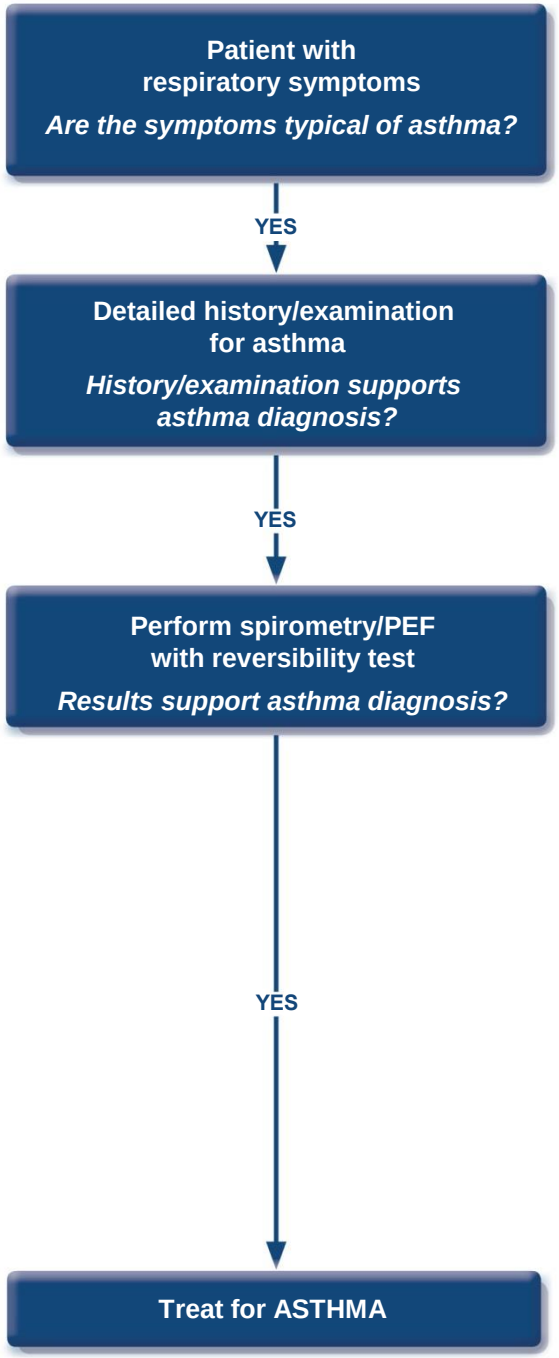
If I have any of the above danger signs, I should dial _____ for an ambulance and say I am having a severe asthma attack.

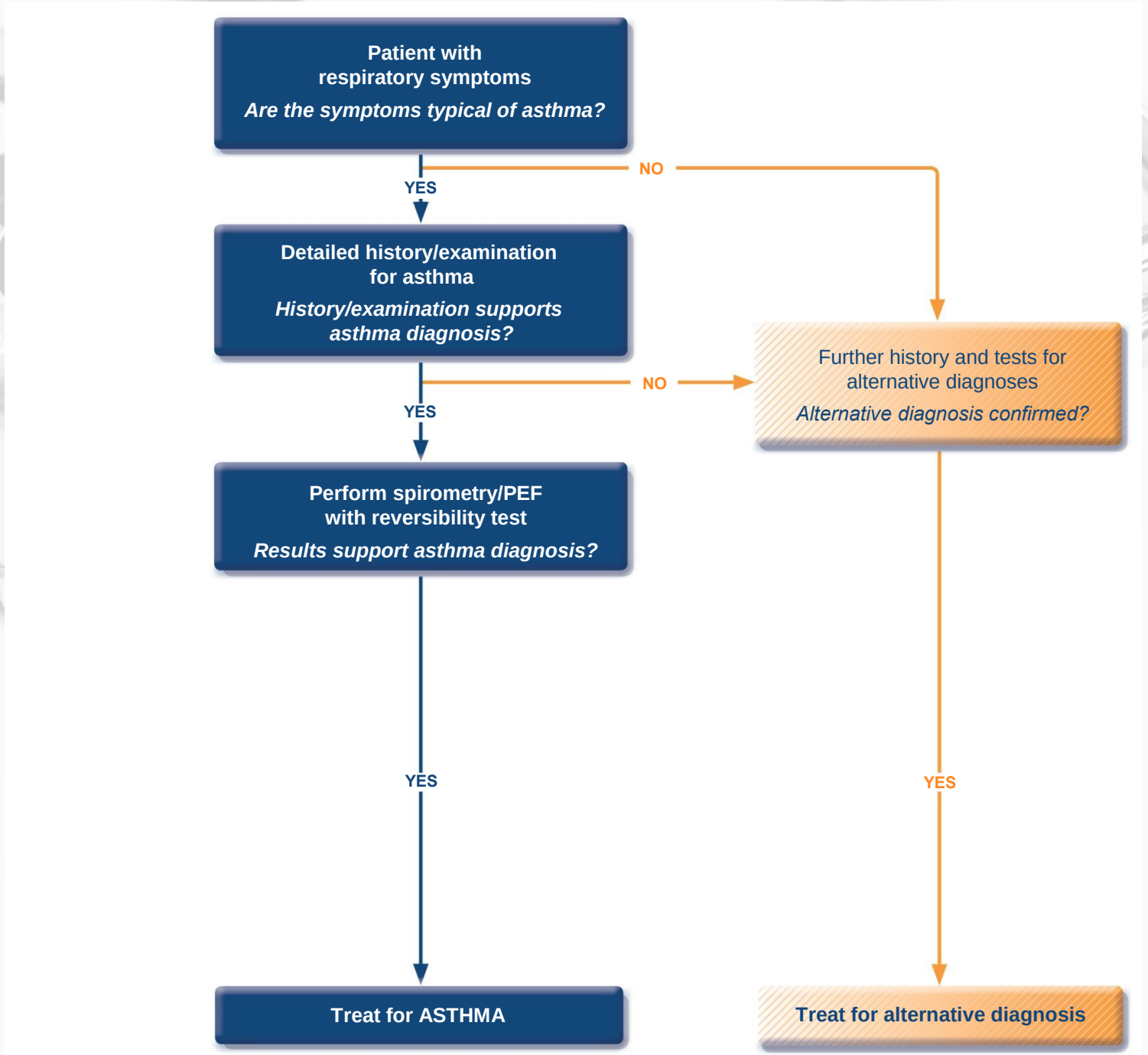
While I am waiting for the ambulance start my asthma first aid plan:

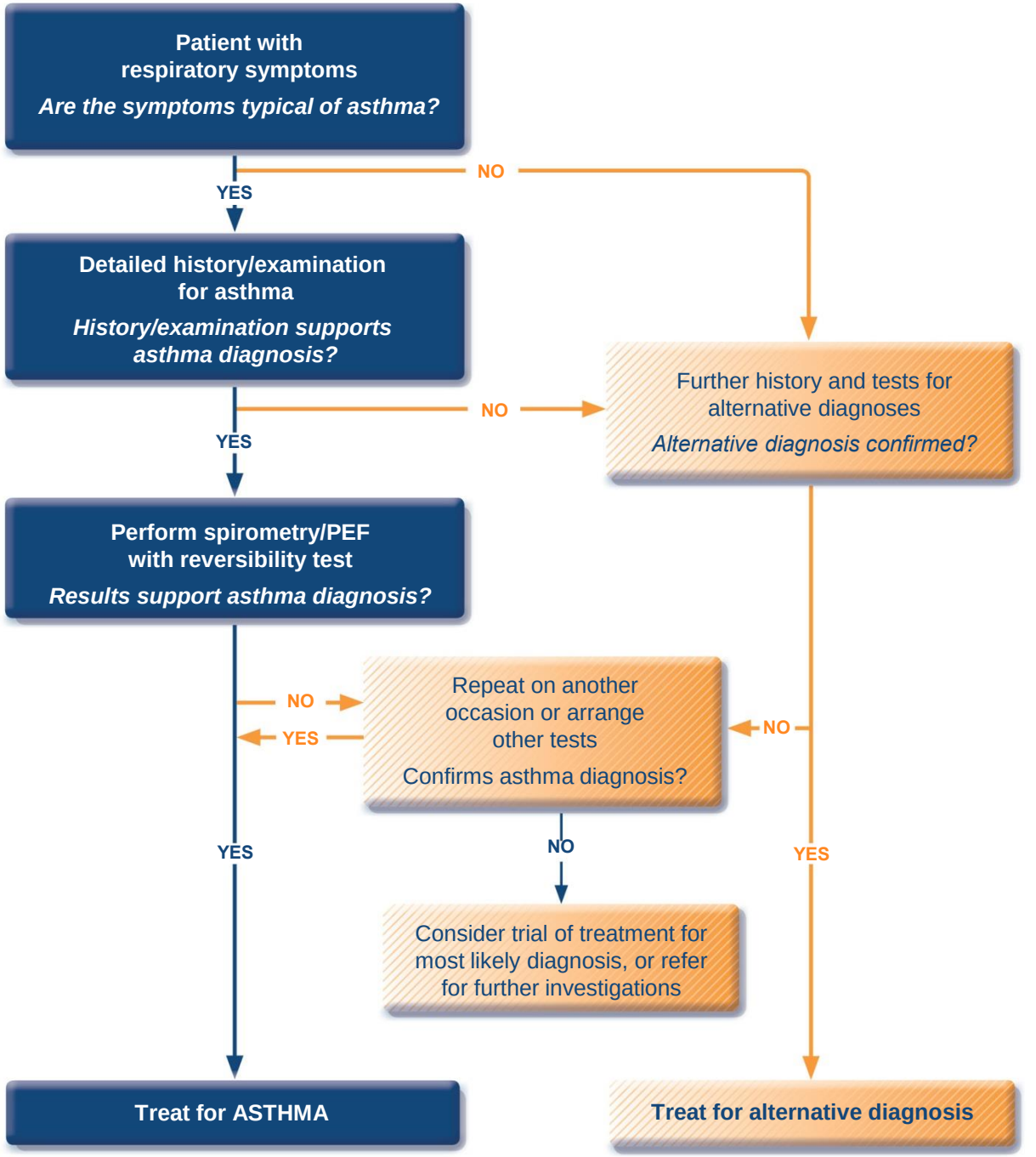
- Sit upright and stay calm.
- Take 1 inhalation of budesonide/formoterol. Wait 1-3 minutes. If there is no improvement, take another inhalation of budesonide/formoterol (up to a maximum of 6 inhalations on a single occasion).
- If only albuterol is available, take 4 puffs as often as needed until help arrives.
- Start a course of prednisolone tablets (as directed) while waiting for the ambulance.
- Even if my symptoms appear to settle quickly, I should see my doctor immediately after a serious attack.

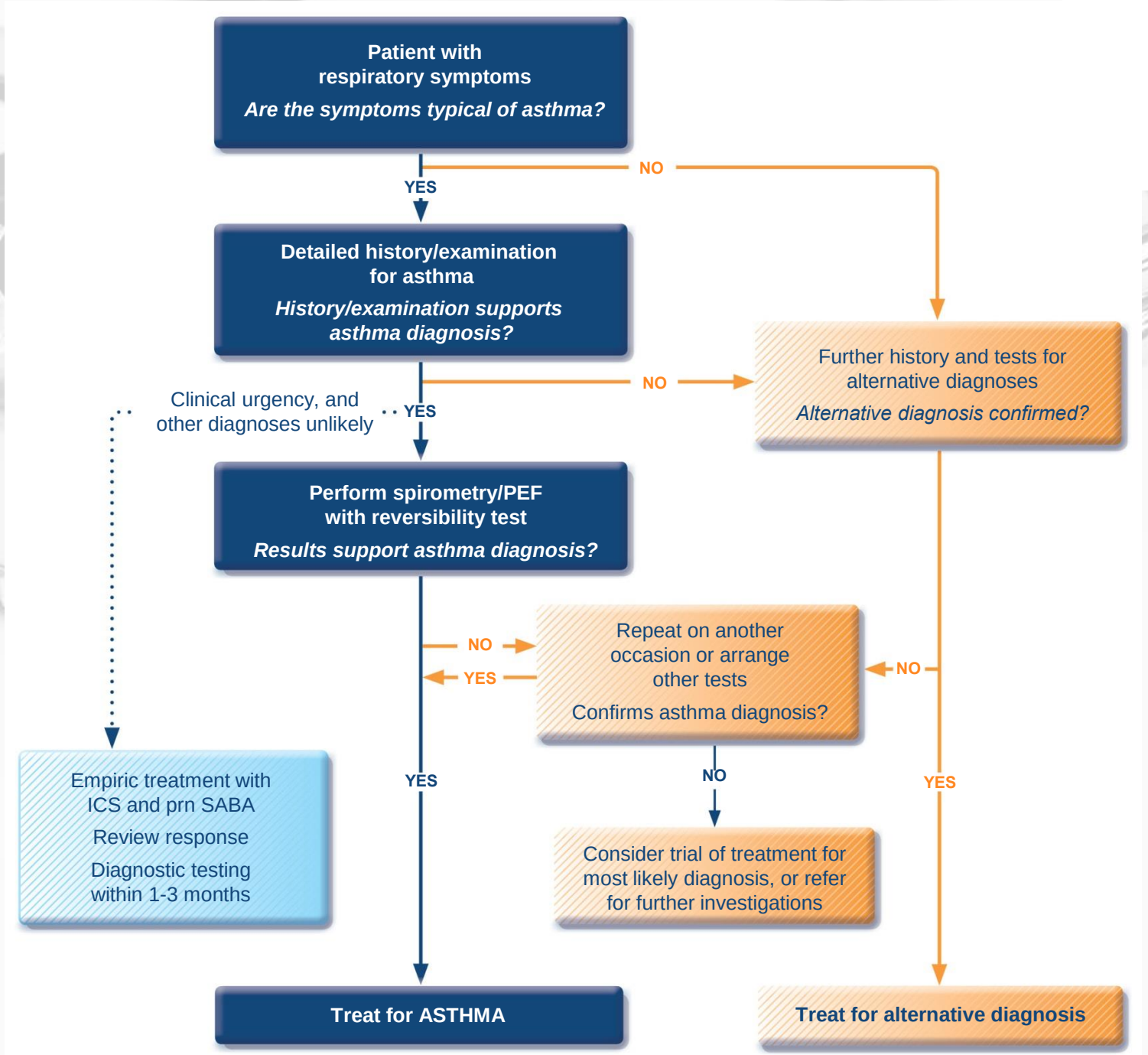
Modified from Australian action plan with permission from National Asthma Council Australia and AstraZeneca Australia

Diagnosis of asthma (be brave!)









Terry Reilly Health Services
1,199 followers
3d •

Today is the last day of Idaho Gives!
https://bit.ly/3zzmleZ Your donations support patients like María.

She had been experiencing asthma-like symptoms that became more severe and she felt hopeless, as she struggled to breathe and speak. "I really didn't know what to do and feared for my life."

Terry Reilly Health Services provider Brian Bizik used his asthma expertise to diagnose a condition that required surgery. She was referred to a specialist and has made a full recovery. She's back to work and spending time with her grandchildren.

...see more

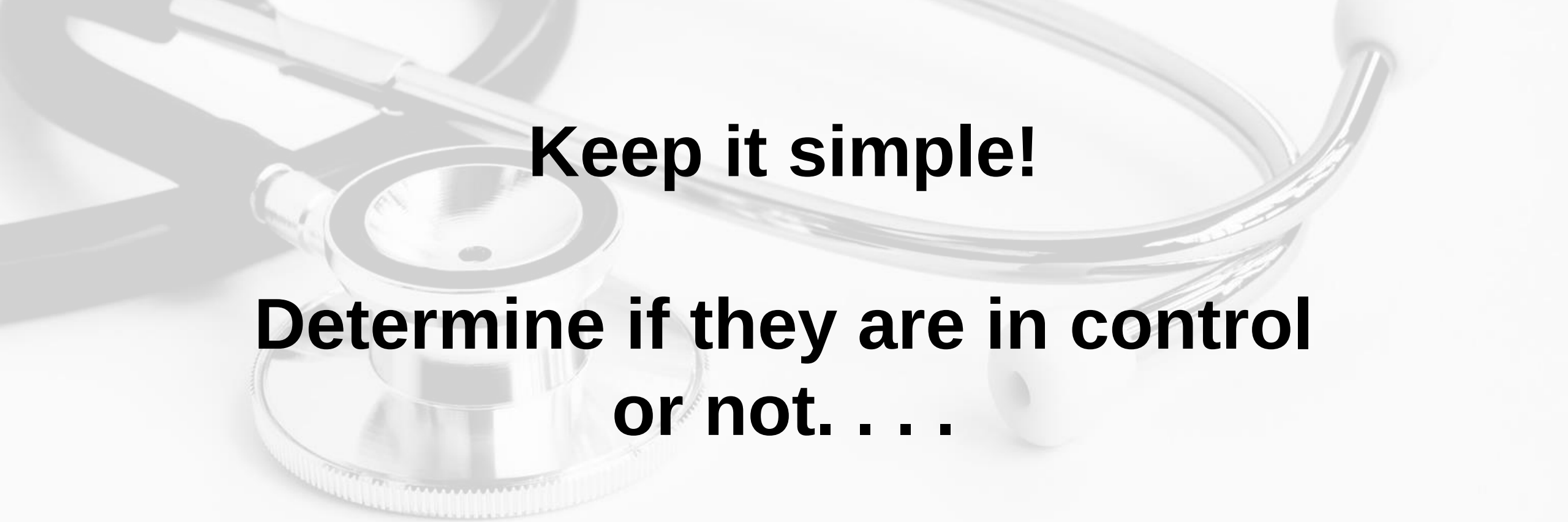
2

Like Comment Repost Send

Add a comment...

Review

- Asthma is a mix of symptoms, often starting young, often an allergic component
- Three types of medications – in order for asthma – Beta-agonists/ICS/Muscarinics
- Don’t allow them to rely on albuterol alone any more
- Minimum use albuterol with an ICS (yes, for some just albuterol is probably ok, just not GINA-ok)
- For many a LABA/ICS is ideal but it has to be Budesonide/Formoterol
- Get them diagnosed with spirometry or PFTs if you can, if you can’t then diagnose based on response
- Now – we are going to treat by stepping up or down



Keep it simple!

Determine if they are in control or not. . . .

Keep it simple!

If they are having an exacerbation ask them how they are when NOT sick. Then you will have one plan for making them better, and one plan for KEEPING them better.

FOR PATIENTS:

Take the Asthma Control Test™ (ACT) for people 12 yrs and older.

Know your score. Share your results with your doctor.

Step 1 Write the number of each answer in the score box provided.

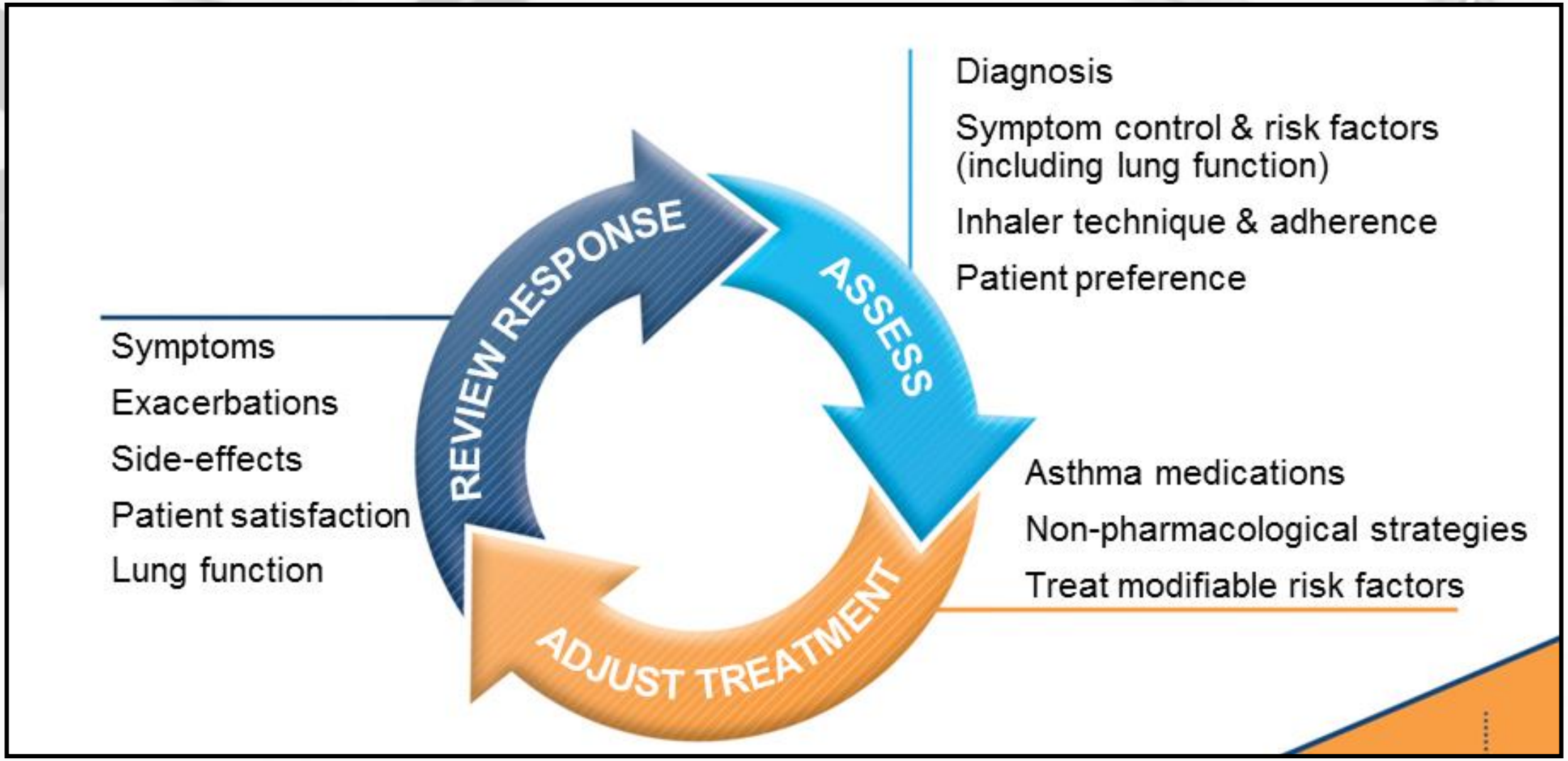
Step 2 Add the score boxes for your total.

Step 3 Take the test to the doctor to talk about your score.

										SCORE
1. In the past **4 weeks**, how much of the time did your **asthma** keep you from getting as much done at work, school or at home?	All of the time	1	Most of the time	2	Some of the time	3	A little of the time	4	None of the time	5	
2. During the past **4 weeks**, how often have you had shortness of breath?	More than once a day	1	Once a day	2	3 to 6 times a week	3	Once or twice a week	4	Not at all	5	
3. During the past **4 weeks**, how often did your **asthma** symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?	4 or more nights a week	1	2 or 3 nights a week	2	Once a week	3	Once or twice	4	Not at all	5	
4. During the past **4 weeks**, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?	3 or more times per day	1	1 or 2 times per day	2	2 or 3 times per week	3	Once a week or less	4	Not at all	5	
5. How would you rate your **asthma** control during the **past 4 weeks**?	Not controlled at all	1	Poorly controlled	2	Somewhat controlled	3	Well controlled	4	Completely controlled	5	
											TOTAL

If your score is 19 or less, your asthma may not be controlled as well as it could be. Talk to your doctor.

FOR PHYSICIANS:


Diagnosis
Symptom control & risk factors (including lung function)
Inhaler technique & adherence
Patient preference
ASSESS
Asthma medications
Non-pharmacological strategies
Treat modifiable risk factors
ADJUST TREATMENT
Symptoms
Exacerbations
Side-effects
Patient satisfaction
Lung function
REVIEW RESPONSE

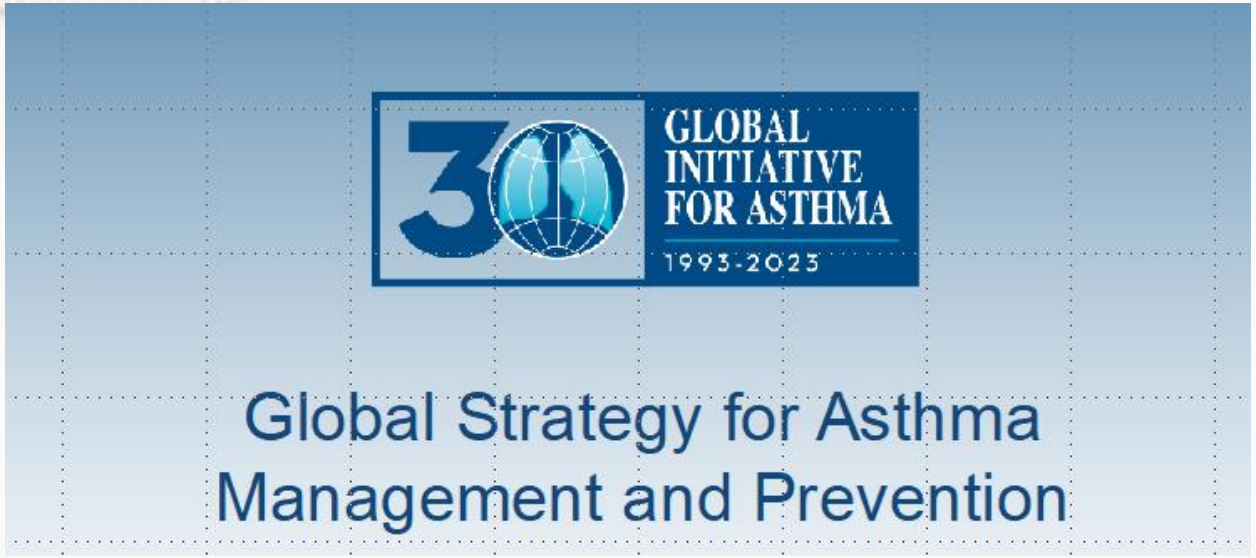
What is good asthma control?

- Minimal daytime and night time symptoms
- Can do what they want to
- No severe flares
- Minimal SABA use, ask about this
  - WHY do they reach for the inhaler
  - WHAT makes them think “I need my puffer”

Rule of 2s – no more than twice a week and no more than 2 inhalers a year

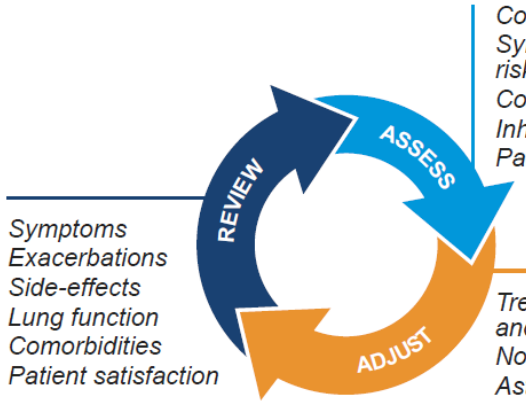
Look at the GINA Guidelines

- Using GINA Guidelines – they are the best
- International
- Non-asthma specialist focus but good for specialty as well
- https://ginasthma.org/



GINA 2023 – Adults & adolescents 12+ years

Personalized asthma management
Assess, Adjust, Review
for individual patient needs



Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (see Box 2-2)
Comorbidities
Inhaler technique & adherence
Patient preferences and goals

Symptoms
Exacerbations
Side-effects
Lung function
Comorbidities
Patient satisfaction

Treatment of modifiable risk factors and comorbidities
Non-pharmacological strategies
Asthma medications (adjust down/up/between tracks)
Education & skills training

TRACK 1: PREFERRED CONTROLLER and RELIEVER
Using ICS-formoterol as the reliever* reduces the risk of exacerbations compared with using a SABA reliever, and is a simpler regimen

STEPS 1 – 2	STEP 3	STEP 4	STEP 5
As-needed-only low dose ICS-formoterol	Low dose maintenance ICS-formoterol	Medium dose maintenance ICS-formoterol	Add-on LAMA Refer for assessment of phenotype. Consider high dose maintenance ICS-formoterol, ± anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

RELIEVER: As-needed low-dose ICS-formoterol*

TRACK 2: Alternative **CONTROLLER and RELIEVER**
Before considering a regimen with SABA reliever, check if the patient is likely to adhere to daily controller treatment

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Take ICS whenever SABA taken*	Low dose maintenance ICS	Low dose maintenance ICS-LABA	Medium/high dose maintenance ICS-LABA	Add-on LAMA Refer for assessment of phenotype. Consider high dose maintenance ICS-LABA, ± anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

RELIEVER: as-needed ICS-SABA*, or as-needed SABA

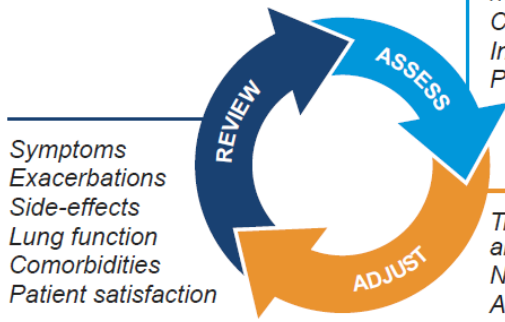
See GINA severe asthma guide

Other controller options (limited indications, or less evidence for efficacy or safety – see text)				
	Low dose ICS whenever SABA taken, or daily LTRA, or add HDM SLIT*	*Medium dose ICS, or add LTRA, or add HDM SLIT*	*Add LAMA or LTRA or HDM SLIT, or switch to high dose ICS*	*Add azithromycin (adults) or LTRA. As last resort consider adding low dose OCS but consider side-effects*

*Anti-inflammatory reliever (AIR)

GINA 2023 – Adults & adolescents 12+ years

Personalized asthma management
Assess, Adjust, Review
for individual patient needs



Symptoms
Exacerbations
Side-effects
Lung function
Comorbidities
Patient satisfaction

Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (see Box 2-2)
Comorbidities
Inhaler technique & adherence
Patient preferences and goals

Treatment of modifiable risk factors and comorbidities
Non-pharmacological strategies
Asthma medications (adjust down/up/between tracks)
Education & skills training

TRACK 1: PREFERRED CONTROLLER and RELIEVER
Using ICS-formoterol as the reliever* reduces the risk of exacerbations compared with using a SABA reliever, and is a simpler regimen

STEPS 1 – 2
As-needed-only low dose ICS-formoterol

STEP 3
Low dose maintenance ICS-formoterol

STEP 4
Medium dose maintenance ICS-formoterol

STEP 5
Add-on LAMA
Refer for assessment of phenotype. Consider high dose maintenance ICS-formoterol, ± anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

RELIEVER: As-needed low-dose ICS-formoterol*

See GINA severe asthma guide

TRACK 2: Alternative CONTROLLER and RELIEVER
Before considering a regimen with SABA reliever, check if the patient is likely to adhere to daily controller treatment

STEP 1
Take ICS whenever SABA taken*

STEP 2
Low dose maintenance ICS

STEP 3
Low dose maintenance ICS-LABA

STEP 4
Medium/high dose maintenance ICS-LABA

STEP 5
Add-on LAMA
Refer for assessment of phenotype. Consider high dose maintenance ICS-LABA, ± anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

RELIEVER: as-needed ICS-SABA*, or as-needed SABA

Other controller options (limited indications, or less evidence for efficacy or safety – see text)

	Low dose ICS whenever SABA taken, or daily LTRA, or add HDM SLIT*	*Medium dose ICS, or add LTRA, or add HDM SLIT*	*Add LAMA or LTRA or HDM SLIT, or switch to high dose ICS*	*Add azithromycin (adults) or LTRA. As last resort consider adding low dose OCS but consider side-effects*

*Anti-inflammatory reliever (AIR)

Box 3-12

Tiotropium/
Spiriva

STEP 5

Add-on LAMA

Refer for assessment of phenotype. Consider high dose maintenance ICS-LABA, ± anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

Biologics

Antibiotic

Anti-inflammatory

Add azithromycin (adults) or LTRA. As last resort consider adding low dose OCS but consider side-effects

FDA requires Boxed Warning about serious mental health side effects for asthma and allergy drug montelukast (Singulair); advises restricting use for allergic rhinitis

Risks may include suicidal thoughts or actions

3-4-2020 FDA Drug Safety Communication

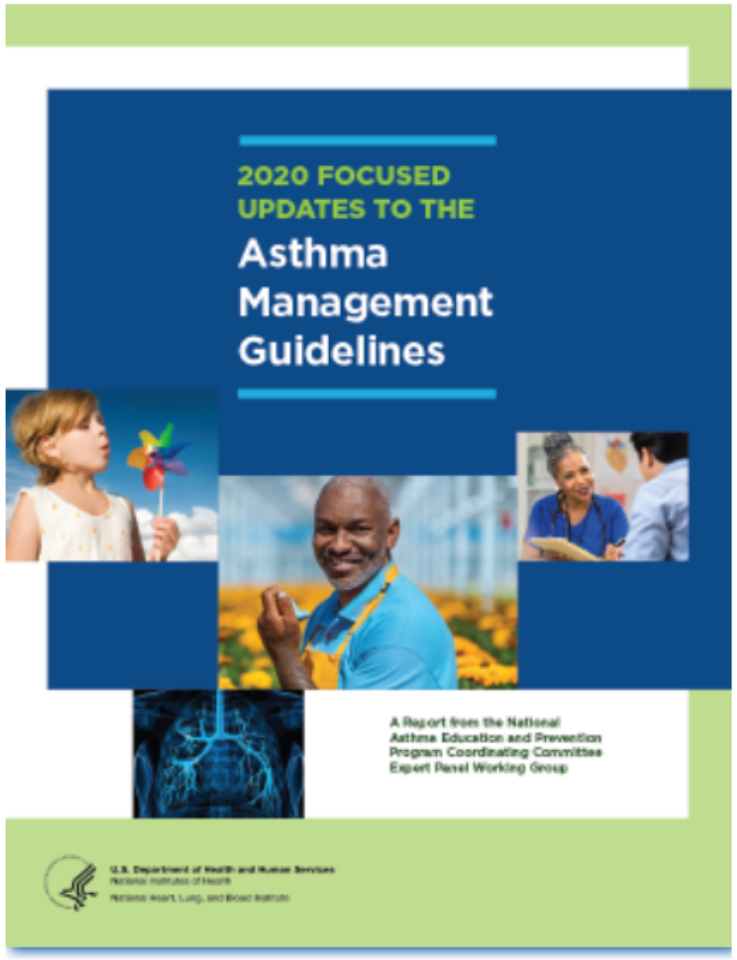
What safety concern is FDA announcing?

The U.S. Food and Drug Administration (FDA) is strengthening existing warnings about serious behavior and mood-related changes with montelukast (Singulair and generics), which is a prescription medicine for asthma and allergy.

We are taking this action after a review of available information led us to reevaluate the benefits and risks of montelukast use. Montelukast prescribing information already includes warnings about mental health side effects, including suicidal thoughts or actions; however, many health care professionals and patients/caregivers are not aware of the risk. We decided a stronger warning is needed after conducting an extensive review of available information and convening a panel of outside experts, and therefore determined that a *Boxed Warning* was appropriate.

Because of the risk of mental health side effects, the benefits of montelukast may not outweigh the risks in some patients, particularly when the symptoms of disease may be mild and adequately treated with other medicines. For allergic rhinitis, also known as hay fever, we have determined that montelukast should be reserved for those who are not treated effectively with or cannot tolerate other allergy medicines. For patients with asthma, we recommend that health care professionals consider the benefits and risks of mental health side effects before prescribing montelukast.

US Guidelines - Very similar to GINA



NHLBI PUBLICATIONS AND RESOURCES

2020 Focused Updates to the Asthma Management Guidelines: A Report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group

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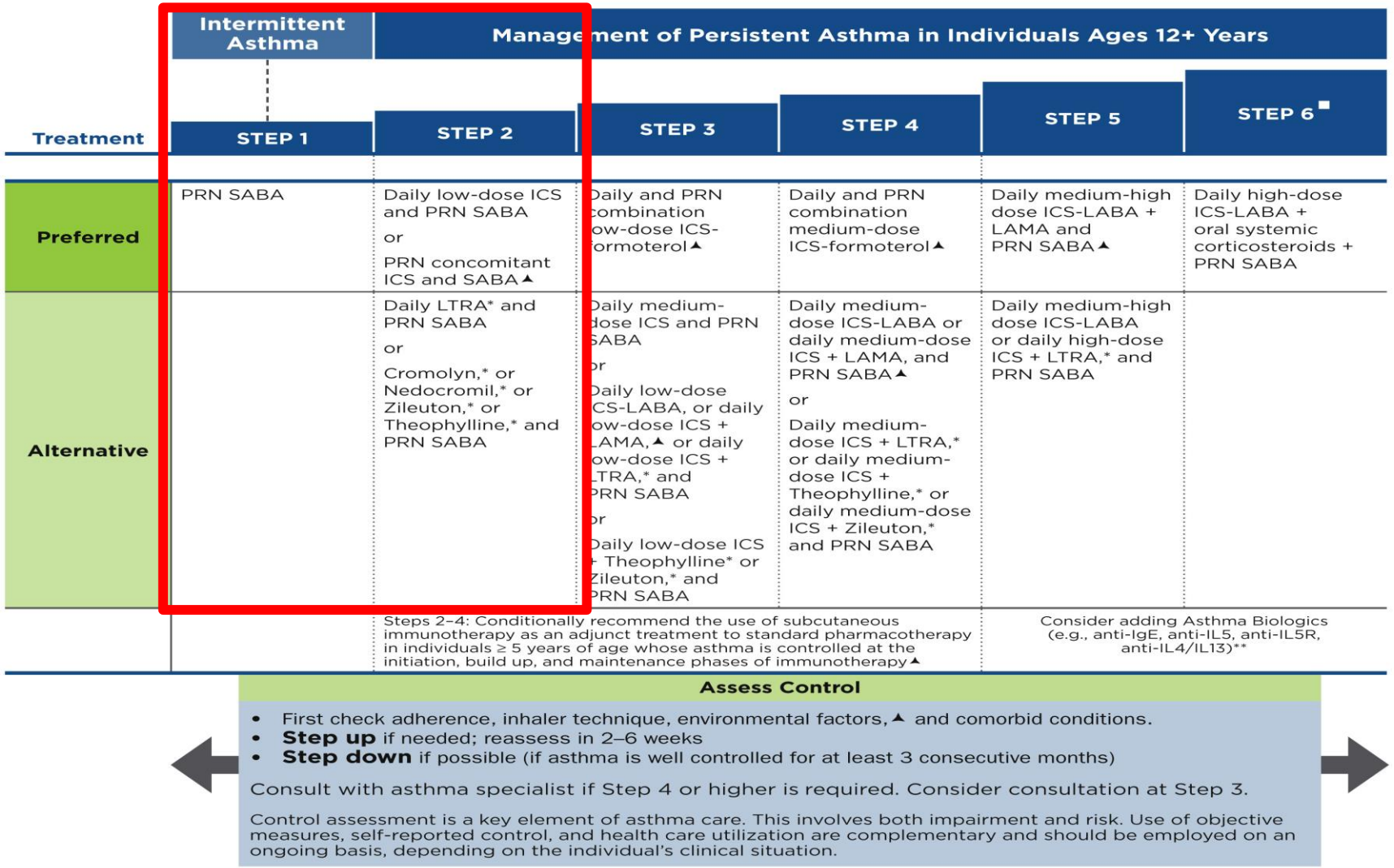
This 2020 report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group presents focused updates to the previous 2007 asthma management guidelines on six priority topics. **Note: The ages 0-4 stepwise approach table was updated in February 2021, and the reprints of the 2020 Focused Updates to the Asthma Management Guidelines from the Journal of Allergy and Clinical Immunology do not reflect the updated table.*

AGES 12+ YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA



Abbreviations: ICS, inhaled corticosteroid; LABA, long-acting beta$_2$-agonist; LAMA, long-acting muscarinic antagonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta$_2$-agonist

Treatment	STEP 1	STEP 2
Preferred	PRN SABA	Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA▲
Alternative		Daily LTRA* and PRN SABA or Cromolyn,* or Nedocromil,* or Zileuton,* or Theophylline,* and PRN SABA

NOTES FOR INDIVIDUALS AGES 12+ YEARS DIAGRAM

Quick-relief medications	Use SABA as needed for symptoms. The intensity of treatment depends on the severity of symptoms: up to 3 treatments at 20-minute intervals as needed. In steps 3 and 4, the preferred option includes the use of ICS-formoterol 1 to 2 puffs as needed up to a maximum total daily maintenance and rescue dose of 12 puffs (54 mcg).▲ **Caution:** Increasing use of SABA or use >2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and may require a step up in treatment.
Each step: Assess environmental factors, provide patient education, and manage comorbidities▲	• In individuals with sensitization (or symptoms) related to exposure to pests‡: conditionally recommend integrated pest management as a single or multicomponent allergen-specific mitigation intervention.▲ • In individuals with sensitization (or symptoms) related to exposure to identified indoor allergens, conditionally recommend a multi-component allergen-specific mitigation strategy.▲ • In individuals with sensitization (or symptoms) related to exposure to dust mites, conditionally recommend impermeable pillow/mattress covers only as part of a multicomponent allergen-specific mitigation intervention, but not as a single component intervention.▲
Notes	• The terms ICS-LABA and ICS-formoterol indicate combination therapy with both an ICS and a LABA, usually and preferably in a single inhaler. • Where formoterol is specified in the steps, it is because the evidence is based on studies specific to formoterol. • In individuals ages 12 years and older with persistent allergic asthma in which there is uncertainty in choosing, monitoring, or adjusting anti-inflammatory therapies based on history, clinical findings, and spirometry, FeNO measurement is conditionally recommended as part of an ongoing asthma monitoring and management strategy that includes frequent assessment. • Bronchial thermoplasty was evaluated in Step 6. The outcome was a conditional recommendation against the therapy.
Abbreviations	EIB, exercise-induced bronchoconstriction; FeNO, fractional exhaled nitric oxide; ICS, inhaled corticosteroid; LABA, long-acting beta2-agonist; SABA, inhaled short-acting beta2-agonist. ▲Updated based on the 2020 guidelines. ‡ Refers to mice and cockroaches, which were specifically examined in the Agency for Healthcare Research and Quality systematic review.

UALS AGES 12+ YEARS DIAGRAM

- Use SABA as needed for symptoms. The intensity of treatment depends on the severity of symptoms: up to 3 treatments at 20-minute intervals as needed.
- In steps 3 and 4, the preferred option includes the use of ICS-formoterol 1 to 2 puffs as needed up to a maximum total daily maintenance and rescue dose of 12 puffs (54 mcg).▲
- **Caution:** Increasing use of SABA or use >2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and may require a step up in treatment.

Reviewing response and adjusting treatment

- GERD, chronic sinusitis, rhinitis all make asthma worse. Tip of the day – ipratropium bromide nasal is amazing
- How often do you need to see them?
  - Q3M following med changes
  - Q1M during pregnancy
  - Q6M normally
  - Q12M for stable for a year or more
- Note on pregnancy – inhaled steroids should not be stopped, if they need them don't stop them.
- Step up or down?
  - Yes, after 3 months or so you can adjust if needed

Reviewing response and adjusting treatment

- The EXACERBATION!
- If they have a significant increase in SABA, wheezing, dyspnea then treatment is indicated
- Options include:
- Increasing the meds they have
- Adding in oral antibiotic (macrolide) or prednisone
- Kids – ½-1 mg per kg is often enough (QD is OK)
- Adults 40 mg x 2 days, 20 mg x 3 days (QD is OK)
- Consider nebulized therapy
- In the end try to figure out why this happened. . . .

Note on PO Steroid Use

Taper?

As you know you DON'T have to taper.

In fact, you should not be putting patients on a dose of steroid that requires a taper.

Tapering is NOT because you have to, it's because you can! You can give them less. . .takes half the dose to keep you well as it did to get you well.

This is where the PATIENT controlled taper is nice:

Take 40 mg till you are 50% better
Take 20 mg till you are back to baseline. . . .

A Note on Nebulizers

- Nebulizers are a known quantity – this can be helpful
- Avoid reliance on them for those school age and older but don’t be afraid to keep them around
- If using budesonide its ok to add albuterol/ipratropium in the same treatment
- Over 2 years should be both albuterol/ipratropium, under 2 it’s anyone's guess.
- OK to give ½ treatment before bed etc
- For little ones – have a favorite game on moms phone!

Review

- Guidelines help you know how/when to step up therapy.
- Make sure they can afford and know how to use their inhaler
- If they are not in control, step up!
- If struggling despite stepping up – refer, biologics are life changing
- Treat exacerbations quickly – macrolides do work for asthma, prednisone if needed. Asthma patients get sick as often as everyone else, they just STAY stick longer
- When in doubt, get help, ask questions, be curious

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