California URGENT CARE ASSOCIATION

2024 WESTERN REGIONAL

URGENT CARE CONFERENCE

Asthma Guideline and Treatment Update CUCA - 2024

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California URGENT CARE ASSOCIATION

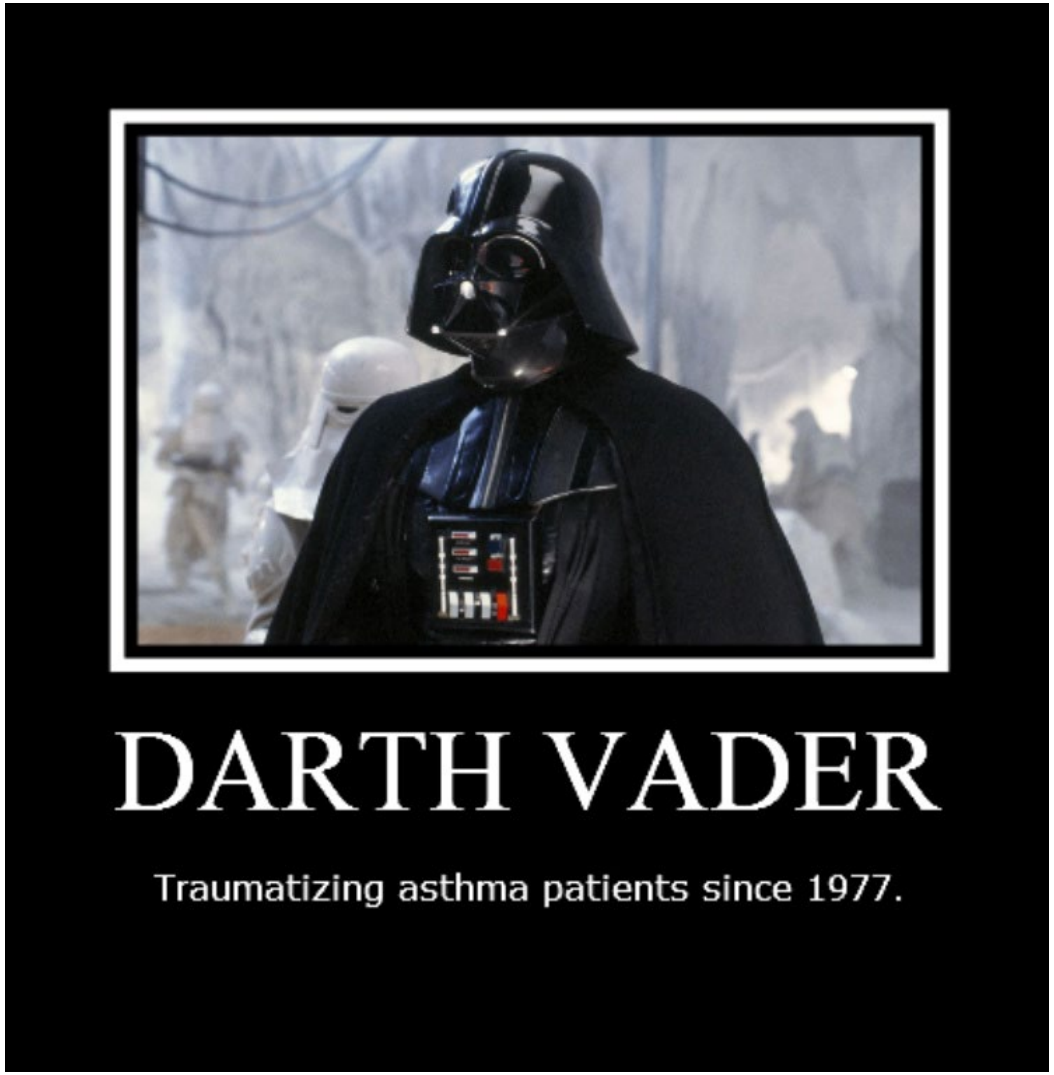
Disclosures

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 April yet FDA approved (asthma only)

- **Quick re-look at the types of inhalers**
- **Talk over the guidelines – there have been two big changes in the past couple years that are relevant to the UC**
- **Like COPD we want to treat patients and get them better – then help them stay better**



Plan For Today

Opening Thoughts on Asthma

- Over and Under Diagnosis is common – up to half are misdiagnosed
- Symptoms are non-specific, a variety of conditions look like asthma
- Inhalers are difficult – very difficult, up to 70% are using incorrectly (take 2 min and show them, may help more than any Rx)
- Asthma is often treated as a recurrent acute disease – with little or no treatment between flares
- I sit on the Idaho Physician Assistant Advisory Board and do extensive legal consulting for pulmonary and urgent care cases brought against PAs and NPs, there are very clear patterns to learn from

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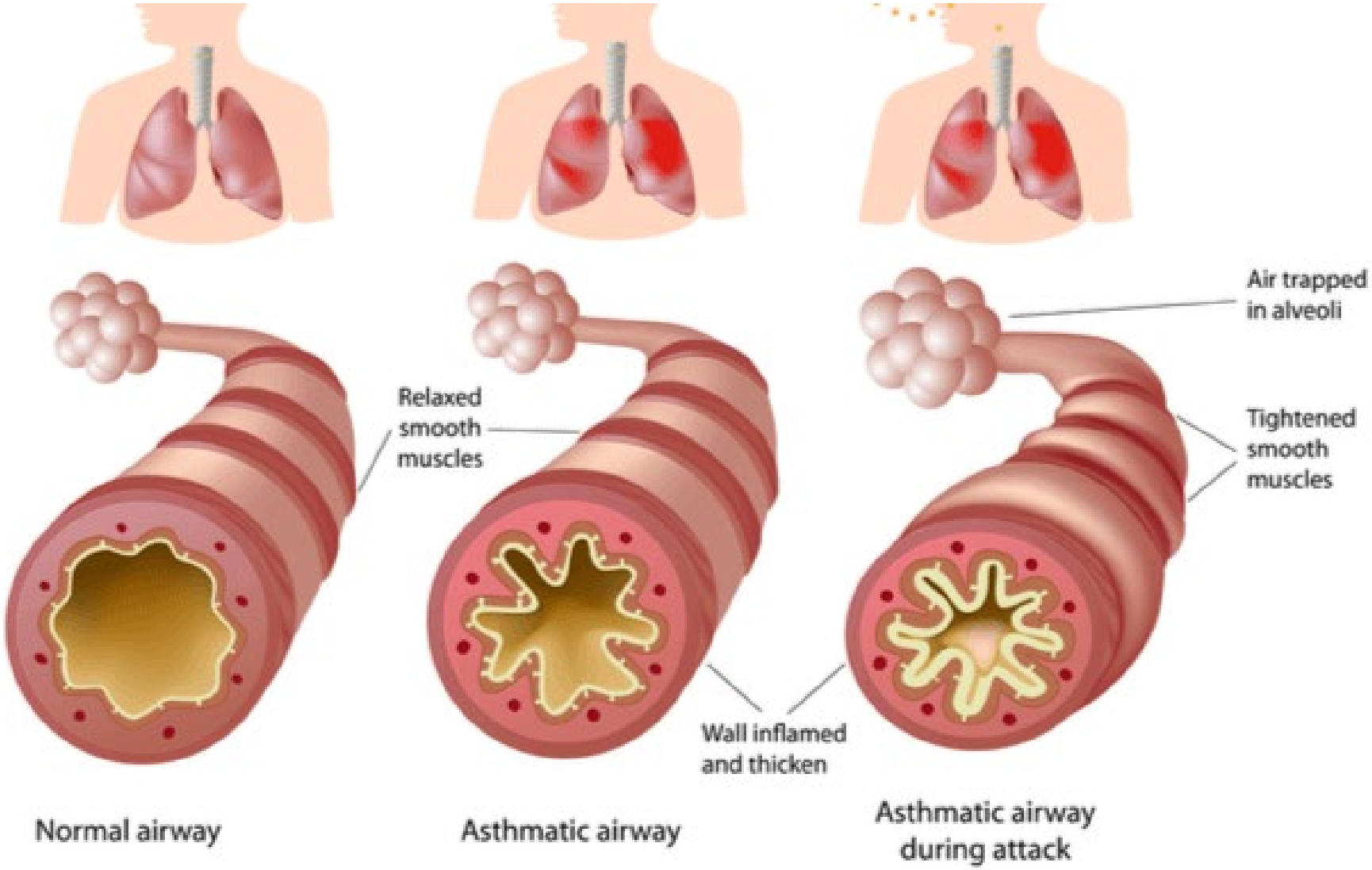
Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org
Sanchis J, Gich I, Pedersen S; Aerosol Drug Management Improvement Team (ADMIT). Systematic Review of Errors in Inhaler Use: Has Patient Technique Improved Over Time? Chest. 2016 Aug;150(2):394-406. doi: 10.1016/j.chest.2016.03.041. Epub 2016 Apr 7. PMID: 27060726.

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



Respiratory medications: Three categories of medications

Albuterol

Short – SABA
Long – LABA

Bronchodilators

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

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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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

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
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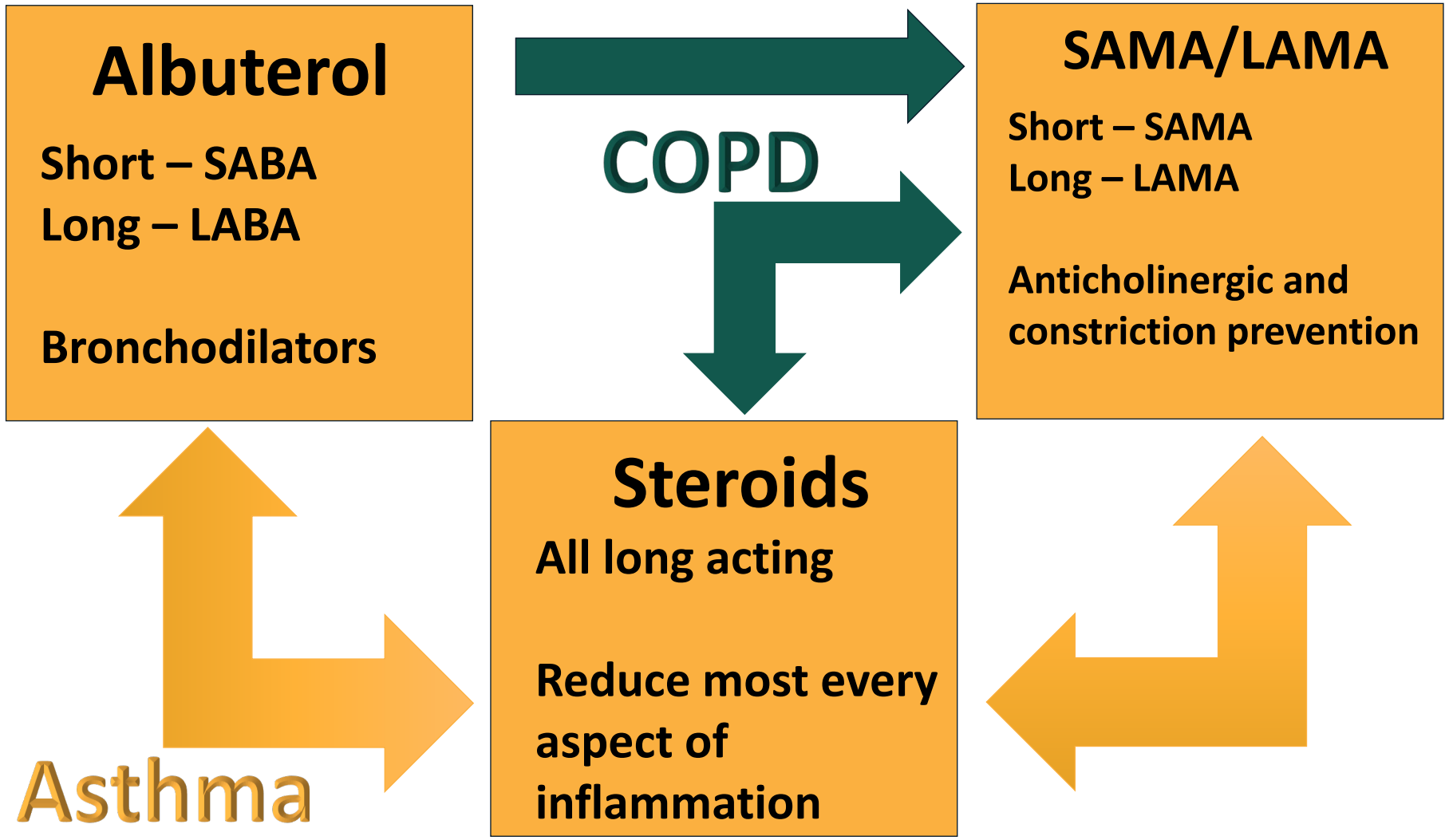
- **Nucala®** — 100 mg — mepolizumab — A
- **Tezspire™** — 210 mg — tezepelumab-ekko — A
- **Xolair®** — 75 to 375 mg — omalizumab — A

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



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QR Code for Inhaler Chart – English

California URGENT CARE ASSOCIATION

QR Code for Inhaler Chart – Spanish

California URGENT CARE ASSOCIATION

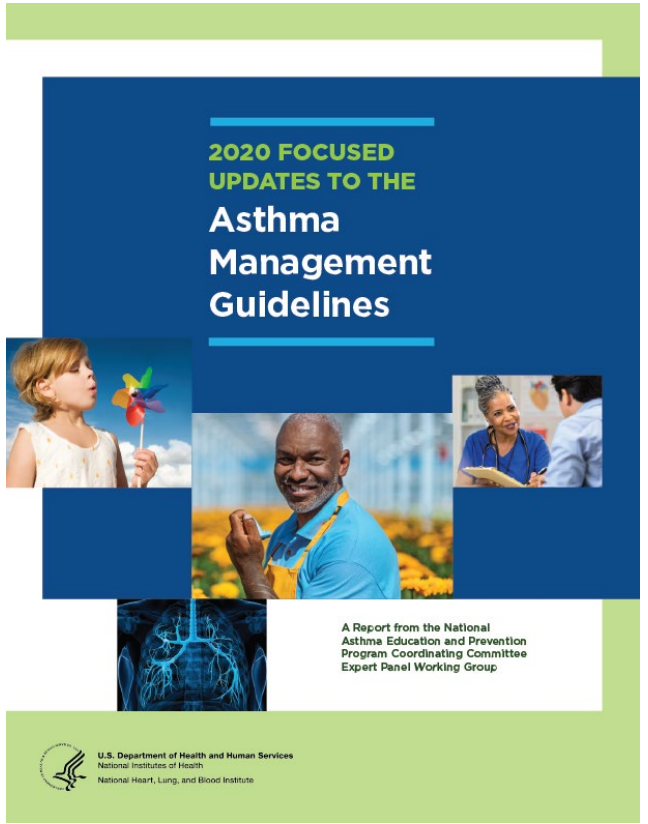
Two Guidelines for Asthma

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

GLOBAL INITIATIVE FOR ASTHMA
1993-2023

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

2020 US Guidelines get a partial "focused" update



California URGENT CARE ASSOCIATION

1. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org
2. Focused Updates to the Asthma Management Guidelines: A Report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group

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.

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Two Key Changes that Effect the UC

- **GINA has made two very big changes to the guidelines in recent years**
- **The first is on disease TREATMENT rather than symptom improvement**
- **The second is because we have a FAST-ACTING beta-agonist that is also LONG-ACTING**
- **The US Guidelines agree with both changes but not in the same stages**

1. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org
2. Focused Updates to the Asthma Management Guidelines: A Report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group

Key change #1 – *Albuterol use*

- **For safety, GINA no longer recommends SABA (albuterol) 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**
- **In the Urgent Care:**
  - **DON'T – prescribe albuterol only (more on this later)**
  - **DO – Talk to the patient about reasonable SABA use**
  - **Do – Document something about the over-use of SABA, risks etc.**
    - **Example quick text "patient was provided an albuterol rescue inhaler. We discussed the use and overuse of this medication and that if use exceeded 2 x per week seeking additional care was mandatory"**

California URGENT CARE ASSOCIATION

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

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.**

California URGENT CARE ASSOCIATION

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

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.
- This is not generic, still quite expensive but for non-insured patients the price is capped at $35
- Can be used alone or with any other controller (long acting)

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 budesonide and you have an inhaler as fast as albuterol but lasts 12 hours
- But what about using this PRN?
- 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 change #2 – *PRN long-acting beta agonist and steroid*

JABFM.ORG
JABFM
JOURNAL OF THE AMERICAN BOARD OF FAMILY MEDICINE

Research Article | Clinical Review

Be SMART About Asthma Management: Single Maintenance and Reliever Therapy

Alexander F. Infante, Christina Wells, Julie Loza, Keia Hobbs, Jennie B. Jarrett and Abigail T. Elmes

The Journal of the American Board of Family Medicine July 2024, 37 (4) 745-752; DOI: https://doi.org/10.3122/jabfm.2023.230456R1

Abstract

Single maintenance and reliever therapy (SMART) is an asthma treatment approach that utilizes combined inhaled corticosteroids and long-acting β-agonists for maintenance and quick relief therapy. Despite the evidence for its benefits in asthma treatment and its adoption into American and international asthma guidelines and recommendations, SMART remains a practice of some debate. This article reviews the available evidence for SMART and offers guidance for its integration into comprehensive asthma management. Overall, short-acting β-agonist-only asthma therapy regimens should be avoided, regardless of condition severity (SOR A Recommendation). Family medicine clinicians should start SMART for patients requiring either GINA Step 3 or 4 therapy, especially if they have signs of poor adherence (SOR B Recommendation). Finally, use budesonide-formoterol over other inhaled corticosteroid/long-acting β-agonist combinations when implementing SMART (SOR B Recommendation).

In this issue

The Journal of the American Board of Family Medicine
Vol. 37, Issue 4
July-August 2024
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Key change #2 – *PRN long-acting beta agonist and steroid*

SABA-Only Therapy Is Broken, Let Us Fix It

Historically, SABA alone, most commonly albuterol, were the only quick relief therapies recommended for "mild asthma" (GINA Step 1 or 2).[20] However, SABA overuse, defined as using SABA more than twice weekly,[1] increases risk of asthma-related emergency department (ED) visits and asthma-related hospitalizations by 25% and 45%, respectively.[2] Further, SABA overuse is associated with increased risk of asthma exacerbation and overall mortality.[3] Primary care clinicians

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

Conclusion

Although a significant shift from traditional asthma management, SMART is a safe and effective asthma treatment approach. Primary care clinicians should not delay starting or transitioning patients aged 4 years or older with asthma requiring a daily maintenance treatment. Despite its effects on immediate symptom relief, SABA-only treatment does not prevent disease progression and should be avoided. Patients receiving ICS-formoterol show improved asthma control and ICS adherence and reduced risk of severe exacerbation over a 12-month period. Long-term data are currently lacking for the risks and benefits of SMART. With new data emerging, it is possible that guidance regarding proper SMART will evolve in the coming years.

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

- **Single Maintenance And Reliever Therapy**
- **Strongly recommend you use this**
- **If they were sick enough to come see you, they need it**
- **Age 6+ (GINA) or 5+ (US) it is guideline based but this is not FDA approved, so insurance may not cooperate**
- **This is for mild to moderate asthma – for more severe asthma they use this, just not PRN, use it BID and then the as-needed can be albuterol/ICS or albuterol**

California URGENT CARE ASSOCIATION

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

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

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 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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	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	
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

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

- **What's practical in the UC for SMART therapy**
  - **Takes twice as much to get you better as it does to keep you better**
  - **Start with 2 puffs BID and PRN**
  - **Taper to 1 puff BID and PRN when mostly better**
  - **Then taper to 1-2 puffs PRN when back to baseline**
  - **Quickly step back up to 2 puffs BID with any illness or exposure**
  - **Max is 12 puffs per day**
  - **Age 12 and under, use the 80 mcg dose (comes in 80 and 160)**

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

- What's practical in the UC for SMART therapy?
- Takes twice as much to get you better as it does to keep you better
- Start with 2 puffs BID and PRN
- Taper to 1 puff BID and PRN when mostly better
- Then taper to 1-2 puffs PRN when back to baseline
- Quickly step back up to 2 puffs BID and PRN with any illness or exposure
- Max is 12 puffs per day
  - Age 12 and under, use the 80 mcg dose (comes in 80 and 160)

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

Asthma Diagnosis

- The only way to diagnose asthma is spirometry or PTF

- However, GINA is very clear that when asthma is suspected, and treatment is started, that a robust response to therapy is adequate for a diagnosis until additional testing can be done

- In the UC, can be very helpful to tell patients/parents that you suspect a diagnosis of asthma - and that you are initiating therapy appropriate for asthma. And that monitoring response to therapy can be very helpful for their PCP

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

What is good asthma control?

- Minimal daytime symptoms (coughing with laughing/playing)
- Minimal nighttime cough/wheeze (night always worse for asthma)
- Can do what they want to (sports, ADLs)
- 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 (200 puffs in albuterol)

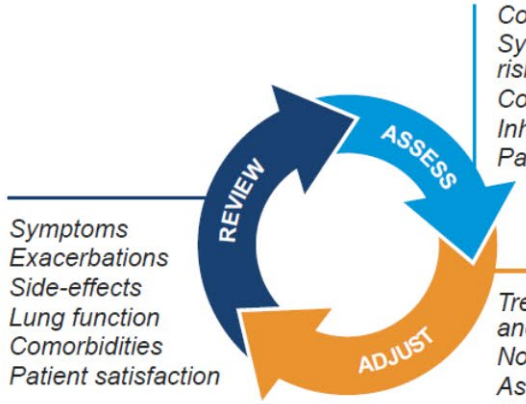
Look at the GINA Guidelines

- Using GINA Guidelines – they are the best
- We want to MAKE them better then help KEEP them better
- https://ginasthma.org/

California URGENT CARE ASSOCIATION

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)

Box 3-12

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

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

LONG-ACTING

- **Incruse® Ellipta®** — 62.5 mcg — umeclidinium inhalation powder — DHK C
- **Ipratropium Bromide Inhalation Solution** — 0.5, 2.5 mg; 2.5 mL — C G N
- **Spiriva® Handi Haler®** — 18 mcg — tiotropium bromide inhalation powder — C
- **Spiriva® Respimat®** — 1.25, 2.5 mcg — tiotropium bromide — DHK A C
- **Tudorza™ Pressair™** — 400 mcg — aclidinium bromide inhalation powder — DPI 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 — DPI A C G
- **Advair® HFA** — 45/21, 115/21, 230/21 mcg — fluticasone propionate and salmeterol xinafoate — DHK A G
- **AirDuo® Digihaler™** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DPI A
- **AirDuo® RespiClick®** — 55/14, 113/14, 232/14 mcg — fluticasone propionate and salmeterol inhalation powder — DPI A G
- **Breo® Ellipta®** — 50/25, 100/25, 200/25 mcg — fluticasone furoate and vilanterol inhalation powder — DPI A C G
- **Breyna™** — 80/4.5, 160/45 mcg — budesonide and formoterol fumarate dihydrate (approved generic of Symbicort) — DHK A C
- **Dulera®** — 50/5, 100/5, 200/5 mcg — mometasone furoate and formoterol fumarate dihydrate — DHK 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) — DHK 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 — DHK C
- **Bevespi Aerosphere®** — 9/4.8 mcg — glycopyrrolate and formoterol fumarate — DHK C
- **Duaklir® Pressair®** — 400, 12 mcg — aclidinium bromide and formoterol fumarate — DPI C
- **Stiolto™ Respimat®** — 2.5/2.5 mcg — tiotropium bromide and olodaterol — DPI 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 — DPI C

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

- **Combivent® Respimat®** — 20/100 mcg — ipratropium bromide and albuterol — DPI 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

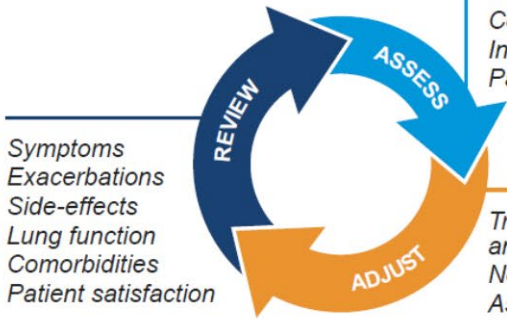
LEUKOTRIENE MODIFIERS

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

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			

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	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				
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

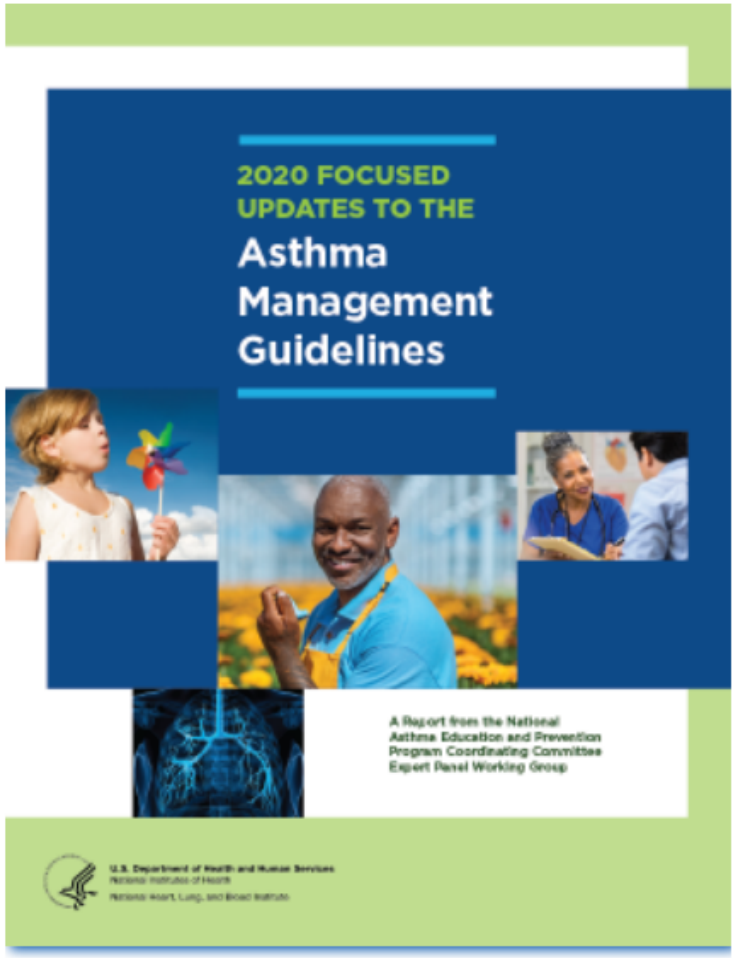
Biologics

Antibiotic

Anti-inflammatory

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

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

Treatment	Intermittent Asthma	Management of Persistent Asthma in Individuals Ages 12+ Years				
	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6■
Preferred	PRN SABA	Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA▲	Daily and PRN combination low-dose ICS-formoterol▲	Daily and PRN combination medium-dose ICS-formoterol▲	Daily medium-high dose ICS-LABA + LAMA and PRN SABA▲	Daily high-dose ICS-LABA + oral systemic corticosteroids + PRN SABA
Alternative		Daily LTRA* and PRN SABA or Cromolyn,* or Nedocromil,* or Zileuton,* or Theophylline,* and PRN SABA	Daily medium-dose ICS and PRN SABA or Daily low-dose ICS-LABA, or daily low-dose ICS + LAMA,▲ or daily low-dose ICS + LTRA,* and PRN SABA or Daily low-dose ICS + Theophylline* or Zileuton,* and PRN SABA	Daily medium-dose ICS-LABA or daily medium-dose ICS + LAMA, and PRN SABA▲ or Daily medium-dose ICS + LTRA,* or daily medium-dose ICS + Theophylline,* or daily medium-dose ICS + Zileuton,* and PRN SABA	Daily medium-high dose ICS-LABA or daily high-dose ICS + LTRA,* and PRN SABA	
		Steps 2–4: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals ≥ 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy▲			Consider adding Asthma Biologics (e.g., anti-IgE, anti-IL5, anti-IL5R, anti-IL4/IL13)**	

Assess Control

- First check adherence, inhaler technique, environmental factors,▲ and comorbid conditions.
- **Step up** if needed; reassess in 2–6 weeks
- **Step down** if possible (if asthma is well controlled for at least 3 consecutive months)

Consult with asthma specialist if Step 4 or higher is required. Consider consultation at Step 3.

Control assessment is a key element of asthma care. This involves both impairment and risk. Use of objective measures, self-reported control, and health care utilization are complementary and should be employed on an ongoing basis, depending on the individual's clinical situation.

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

Montelukast (Singulair)

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

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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.

Office of the New York State Attorney General

Letitia James
New York State Attorney General

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Home | Press Releases | Attorney General James Calls For Urgent Action To Protect Children From Harmful Effects of Asthma and Allergy Drug Singulair

Attorney General James Calls for Urgent Action to Protect Children from Harmful Effects of Asthma and Allergy Drug Singulair

February 22, 2024

NEW YORK – New York Attorney General Letitia James called on the U.S. Food and Drug Administration (FDA) to take urgent action to address the potential dangers of the asthma and allergy drug montekulast, known by the brand name Singulair. Singulair has been linked to harmful behavioral and mental health issues among children who use the drug to treat asthma and respiratory allergies. In a letter to FDA Commissioner Robert M. Califf, the Office of the Attorney General (OAG) highlights recent reports of significant mental and behavioral health risks associated with Singulair use among minors, including aggression, depression, and even suicide, and urges FDA to implement new, more stringent safety regulations for the drug.

For the UC – probably do not start/stop. For patients with new onset psych issues or night terrors, consider this and suggest they talk to their PCP

Asthma Exacerbations - Definition

- Asthma exacerbations are any change in symptoms that require a change in therapy
- Typically include an increase in cough, an increase in sputum or a change in the color of the sputum and wheeze
- There is likely a change in the baseline breathing – peak flow or FEV1 would be down if measured

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Side-Bar: Wheezing

- **Wheezing is a high-pitched musical sound from the vibration of pulmonary walls. Normally silent or at least quiet**
- **Polyphonic – multiple pitches : Monophonic - one pitch**
- **Expiratory – more common, less concerning 'end expiratory'**
- **Inspiratory – less common, VERY concerning**
- **When it happens (inspiration vs exhalation) and duration correlate with severity.**

California URGENT CARE ASSOCIATION

1 Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org
2 Bohadana A, Izbicki G, Kraman SS. Fundamentals of lung auscultation. N Engl J Med. 2014 Feb 20;370(8):744-51. doi: 10.1056/NEJMra1302901. PMID: 24552321.

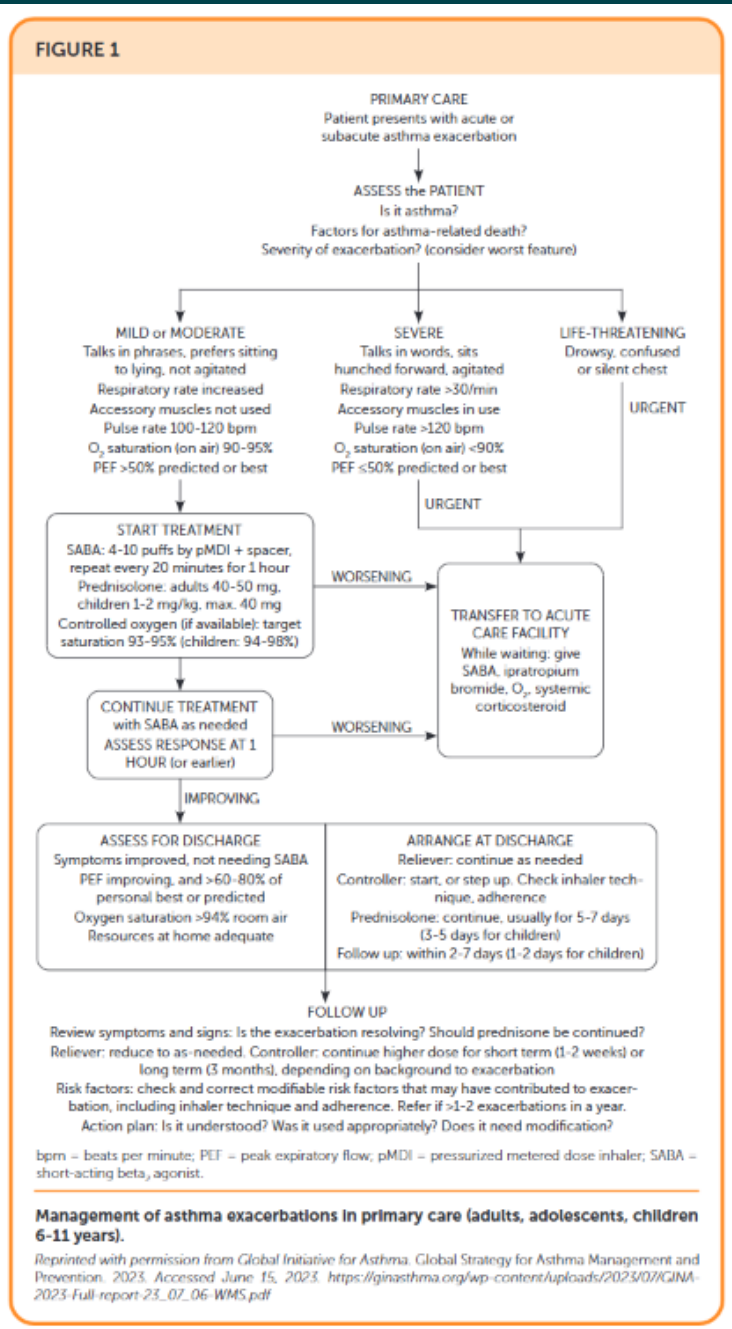
Increased Risk of Severe Outcomes and Death

Box 9-1. Factors associated with increased risk of asthma-related death

- A history of near-fatal asthma requiring intubation and mechanical ventilation[709]
- Hospitalization[709,710] or emergency care visit for asthma in the past year
- Currently using or having recently stopped using oral corticosteroids (a marker of event severity)[89,709]
- Not currently using inhaled corticosteroids[90,709]
- Over-use of short-acting beta$_2$ agonists (SABAs), especially use of an average of more than one canister of salbutamol (or equivalent) per month,[87,111,711] or using nebulized SABA[712]
- Poor adherence with ICS-containing medications and/or poor adherence with (or lack of) a written asthma action plan[103]
- A history of psychiatric disease or psychosocial problems[103]
- Food allergy in a patient with asthma[544,713]
- Several comorbidities including pneumonia, diabetes and arrhythmias were independently associated with an increased risk of death after hospitalization for an asthma exacerbation[710]

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

For Reference



Management of asthma exacerbations in primary care (adults, adolescents, children 6-11 years).

Reprinted with permission from Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2023. Accessed June 15, 2023. https://ginasthma.org/wp-content/uploads/2023/07/GINA-2023-Full-report-23_07_06-WMS.pdf

1 Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

2 DABBS, W.; BRADLEY, M. H.; CHAMBERLIN, S. M. Acute Asthma Exacerbations: Management Strategies. American family physician, [s. l.], v. 109, n. 1, p. 43–50, 2024

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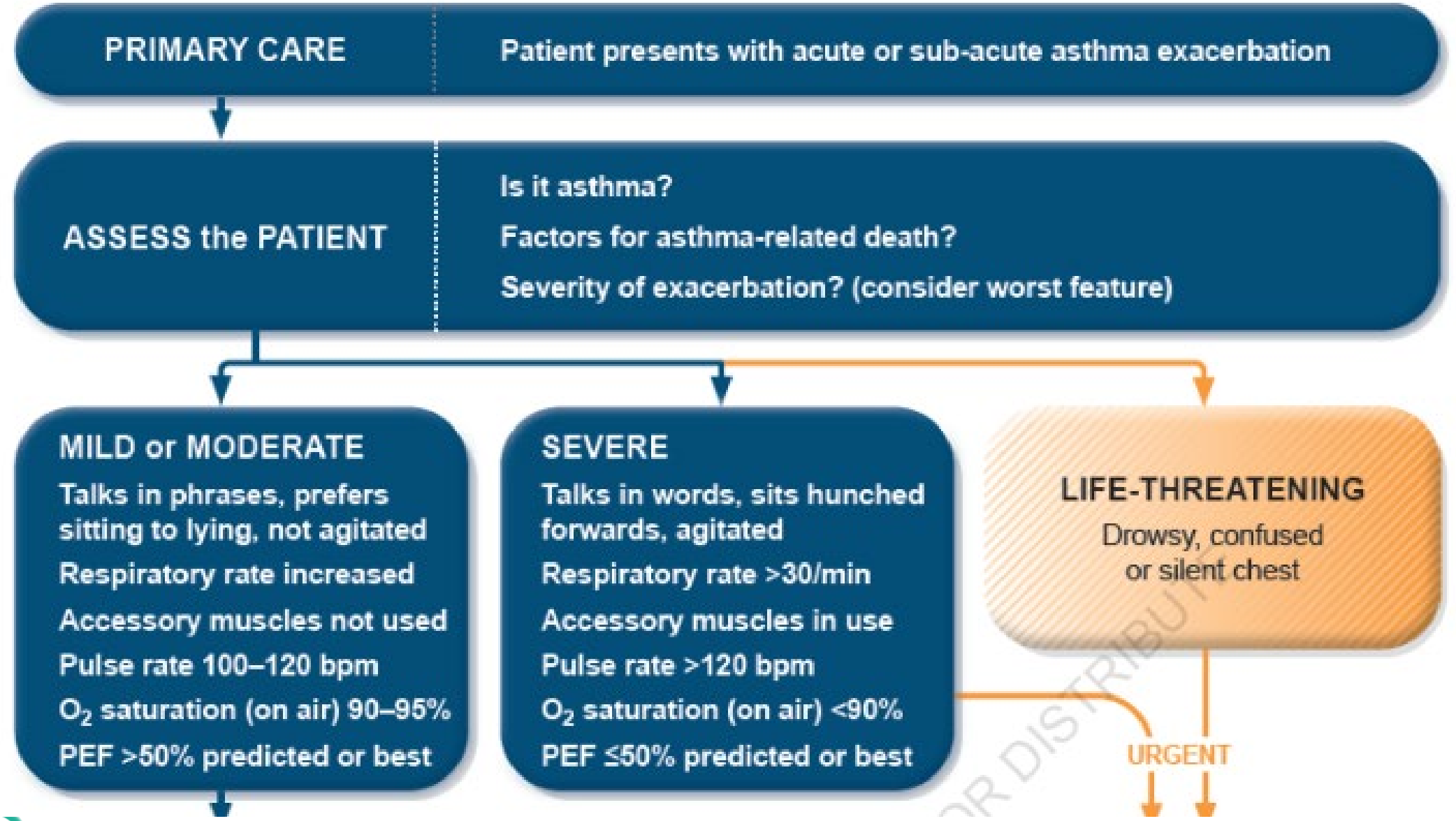
Asthma Exacerbations – Assessment



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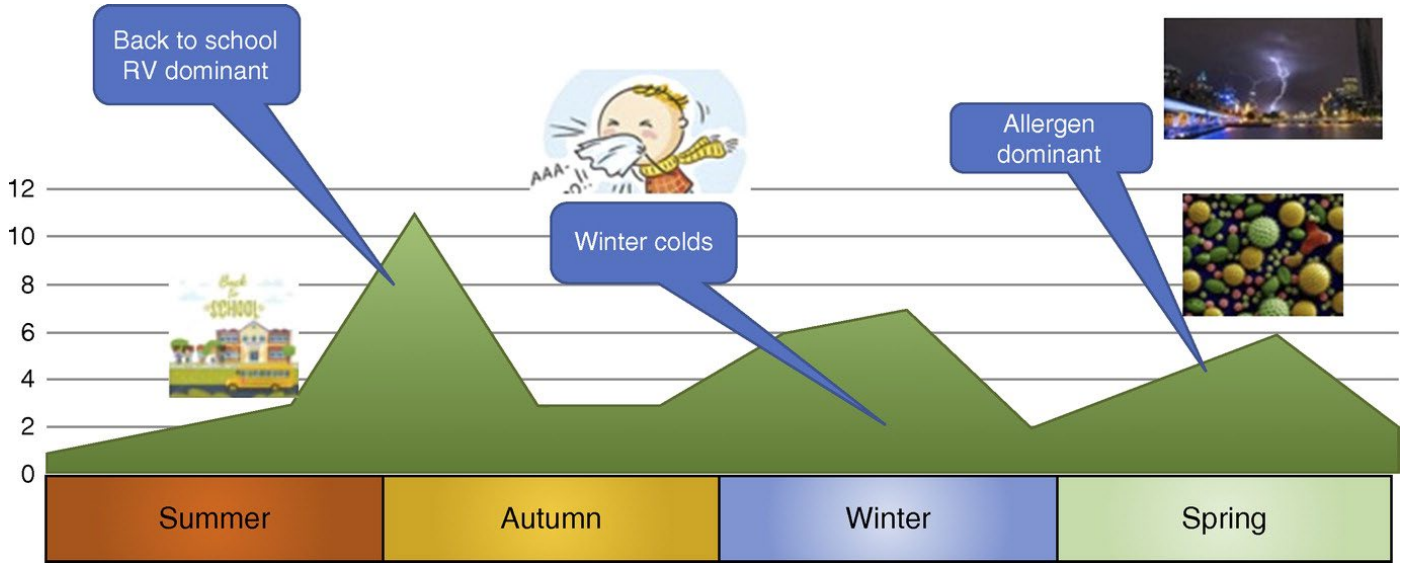
Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Asthma Exacerbations - Causes

- Most are viral – 80% or so
- Rarely are they INITIALLY bacterial
- Allergen exposure, environmental exposures, smoke/vape
- Post food allergy exposure, post anaphylaxis



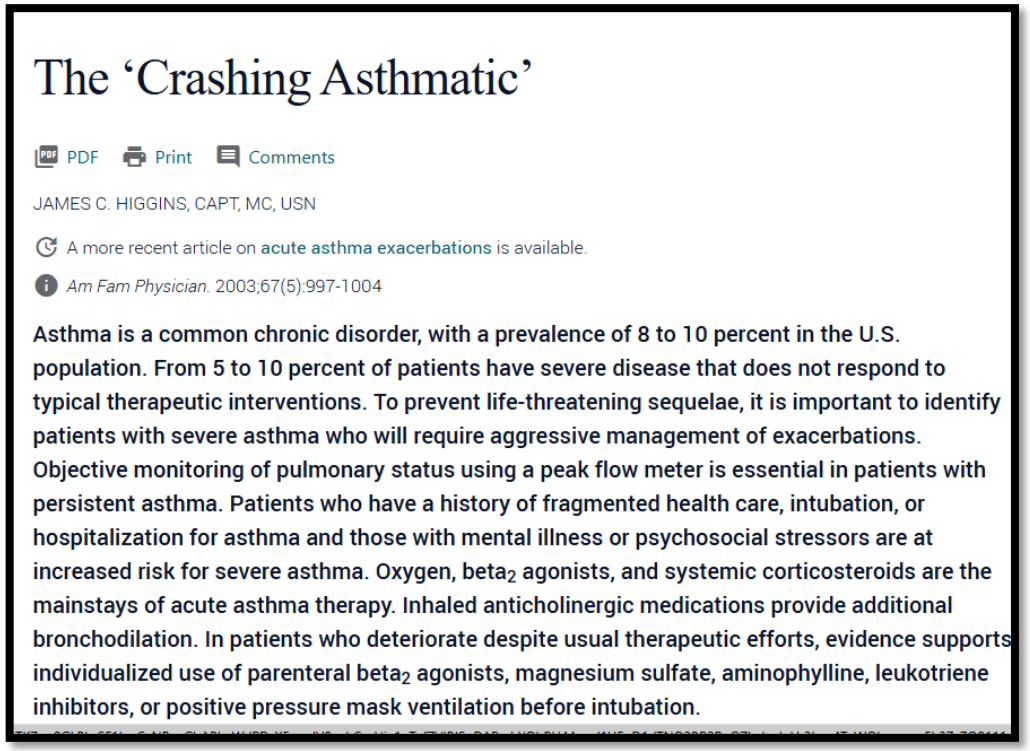
Start of school is always the biggest asthma flare season, especially first time in school or Head Start

California URGENT CARE ASSOCIATION

1 Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org
2 Mechanisms and Management of Asthma Exacerbations. J. Michael Ramsahai, Philip M. Hansbro, Peter A. B. Wark. American Journal of Respiratory and Critical Care Medicine. Volume 199, Issue 4

Side-Bar: Status Asthmaticus

- The severe asthmatic/exacerbation
- You don't know when this is going to happen, they need to be in the ED.
- Do not delay transfer of care
- While waiting:
  - Start O2 (sat goal 95% or so)
  - Start continuous (stacked) nebulizer treatment with albuterol/ipratropium (one SVN q20m x 3) or 4 puffs of albuterol with spacer if available q20m x 3)
  - Give IV or oral dexamethasone or prednisone if available. IM dexamethasone not quick enough in status patients



The 'Crashing Asthmatic'

PDF Print Comments

JAMES C. HIGGINS, CAPT, MC, USN

A more recent article on acute asthma exacerbations is available.

Am Fam Physician. 2003;67(5):997-1004

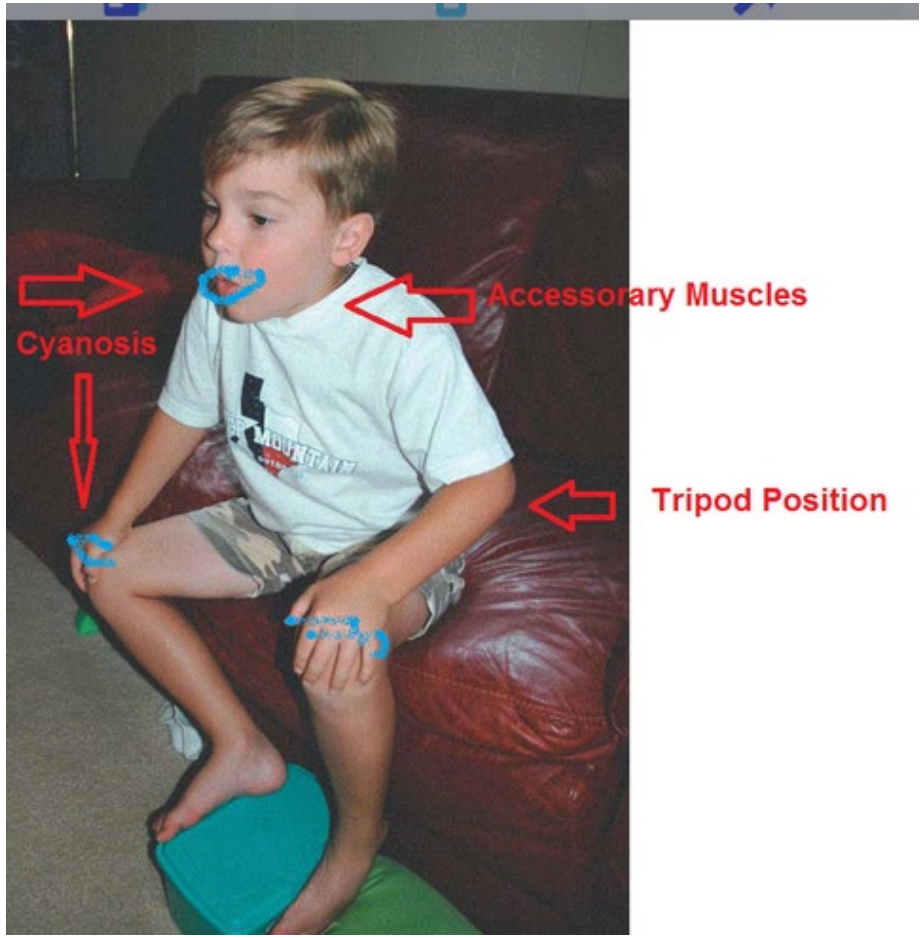
Asthma is a common chronic disorder, with a prevalence of 8 to 10 percent in the U.S. population. From 5 to 10 percent of patients have severe disease that does not respond to typical therapeutic interventions. To prevent life-threatening sequelae, it is important to identify patients with severe asthma who will require aggressive management of exacerbations. Objective monitoring of pulmonary status using a peak flow meter is essential in patients with persistent asthma. Patients who have a history of fragmented health care, intubation, or hospitalization for asthma and those with mental illness or psychosocial stressors are at increased risk for severe asthma. Oxygen, beta$_2$ agonists, and systemic corticosteroids are the mainstays of acute asthma therapy. Inhaled anticholinergic medications provide additional bronchodilation. In patients who deteriorate despite usual therapeutic efforts, evidence supports individualized use of parenteral beta$_2$ agonists, magnesium sulfate, aminophylline, leukotriene inhibitors, or positive pressure mask ventilation before intubation.

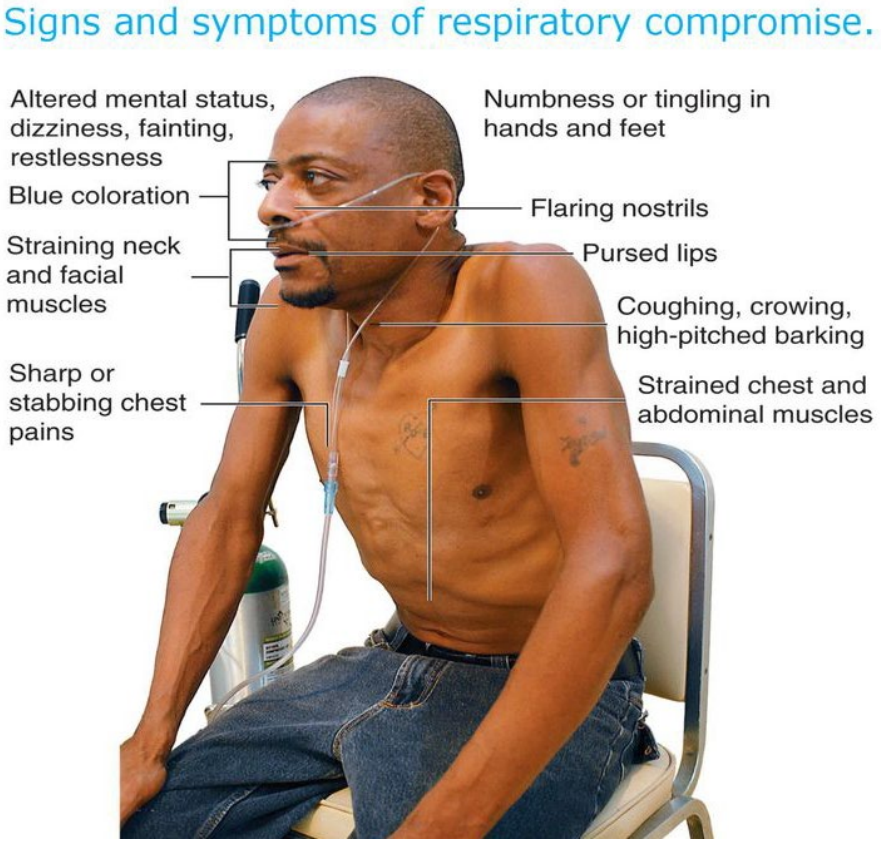
California URGENT CARE ASSOCIATION

1 Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org
2 Rogerson CM, White BR, Abu-Sultaneh S. Pharmacological Management of Pediatric Critical Asthma. Respir Care. 2024 Sep 30:respcare.12458. doi: 10.4187/respcare.12458. Epub ahead of print. PMID: 39348943.

Side-Bar: Severe Asthma and Status Asthmaticus

- Watch for these signs
- Be very wary of the quite chest
- Wheezing can increase after one SVN





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Severe Asthma – Paediatric Focus, For Reference

IMMEDIATE & OBJECTIVE ASSESSMENT OF THE ASTHMA EXACERBATION SEVERITY

CLINICAL FEATURES FOR THE DIFFERENT CLASSIFICATIONS OF ASTHMA SEVERITY				
	MILD	**MODERATE**	**SEVERE**	**IMPENDING RESP. FAILURE**
MENTAL STATUS	Normal	May be agitated	Agitated	Drowsy, confused (signs of cerebral hypoxemia)
ACTIVITY & FEEDING	Normal activity, exertional dyspnea	↓ activity, ↓ feeding (infants)	↓ activity, stops feeding	Unable to feed
SPEECH	Normal speech	Speaks in **phrases**	Speaks in **words**	Unable to speak
WORK OF BREATHING	Minimal intercostal retractions	Intercostal and substernal retractions	Significant **respiratory distress**. Involves all accessory muscles, nasal flaring, paradoxical thoraco-abdominal movement.	Marked **respiratory distress** at rest. Involves all accessory muscles, nasal flaring, paradoxical thoraco-abdominal movement.
CHEST AUSCULTATION	Moderate wheeze	Pan-expiratory and inspiratory wheeze	Audible wheeze without stethoscope	Silent chest (no air entry), absence of wheeze
SpO_2 ON R/A	> 94%	91-94%	< 90%	< 90%
PEAK FLOW VS. PERSONAL BEST	> 80%	60-80%	< 60%	Unable to perform

California URGENT CARE ASSOCIATION

Scotney E, Burchett S, Goddard T, Saglani S. Pediatric problematic severe asthma: Recent advances in management. Pediatr Allergy Immunol. 2021 Oct;32(7):1405-1415. doi: 10.1111/pai.13543. Epub 2021 Jun 3. PMID: 34002877.

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California URGENT CARE ASSOCIATION

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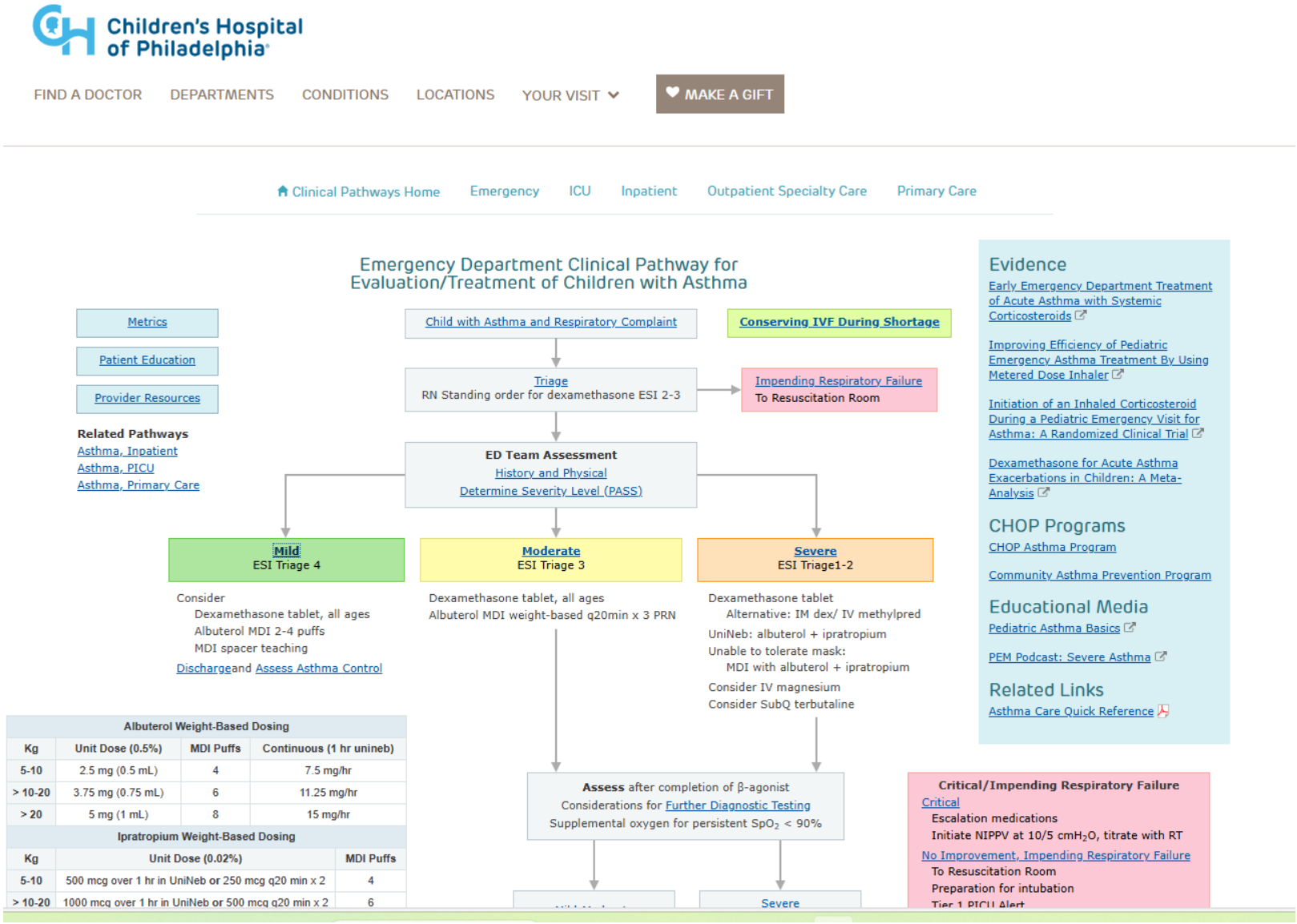
Severe Asthma – Paediatric Focus, For Reference

https://pathways.chop.edu/clinical-pathway/asthma-emergent-care-clinical-pathway



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Emergency Department Clinical Pathway for Evaluation/Treatment of Children with Asthma

Metrics
Patient Education
Provider Resources

Related Pathways
Asthma, Inpatient
Asthma, PICU
Asthma, Primary Care

Child with Asthma and Respiratory Complaint

Conserving IVF During Shortage

Triage
RN Standing order for dexamethasone ESI 2-3

Impending Respiratory Failure
To Resuscitation Room

ED Team Assessment
History and Physical
Determine Severity Level (PASS)

Mild
ESI Triage 4

Consider
Dexamethasone tablet, all ages
Albuterol MDI 2-4 puffs
MDI spacer teaching
Discharge and Assess Asthma Control

Moderate
ESI Triage 3

Dexamethasone tablet, all ages
Albuterol MDI weight-based q20min x 3 PRN

Severe
ESI Triage1-2

Dexamethasone tablet
Alternative: IM dex/ IV methylpred
UniNeb: albuterol + ipratropium
Unable to tolerate mask:
MDI with albuterol + ipratropium
Consider IV magnesium
Consider SubQ terbutaline

Assess after completion of β-agonist
Considerations for Further Diagnostic Testing
Supplemental oxygen for persistent SpO_2 < 90%

Severe

Critical/Impending Respiratory Failure
Critical
Escalation medications
Initiate NIPPV at 10/5 cmH_2O, titrate with RT
No Improvement, Impending Respiratory Failure
To Resuscitation Room
Preparation for intubation
Tier 1 PICU Alert

Albuterol Weight-Based Dosing

Kg	Unit Dose (0.5%)	MDI Puffs	Continuous (1 hr unineb)
5-10	2.5 mg (0.5 mL)	4	7.5 mg/hr
> 10-20	3.75 mg (0.75 mL)	6	11.25 mg/hr
> 20	5 mg (1 mL)	8	15 mg/hr

Ipratropium Weight-Based Dosing

Kg	Unit Dose (0.02%)	MDI Puffs
5-10	500 mcg over 1 hr in UniNeb or 250 mcg q20 min x 2	4
> 10-20	1000 mcg over 1 hr in UniNeb or 500 mcg q20 min x 2	6

Evidence
Early Emergency Department Treatment of Acute Asthma with Systemic Corticosteroids
Improving Efficiency of Pediatric Emergency Asthma Treatment By Using Metered Dose Inhaler
Initiation of an Inhaled Corticosteroid During a Pediatric Emergency Visit for Asthma: A Randomized Clinical Trial
Dexamethasone for Acute Asthma Exacerbations in Children: A Meta-Analysis

CHOP Programs
CHOP Asthma Program
Community Asthma Prevention Program

Educational Media
Pediatric Asthma Basics
PEM Podcast: Severe Asthma

Related Links
Asthma Care Quick Reference

California URGENT CARE ASSOCIATION

Asthma Exacerbations – Treatment for MILD to MODERATE in the UC

- Provide nebulized therapy or MDI therapy in office if needed
  - If there is any issue with communication, do this
- Get a good Hx and Px, determine duration of illness and likely cause if possible
- Review medications they have, should have. Use the poster, point to photos.
- Every flare is an opportunity to teach about asthma, prevent future flares. Asthma is not a recurrent acute illness.

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Asthma Exacerbations – Treatment for MILD to MODERATE

- Get out and Asthma Action Plan early, write this out with the patient/parents watching you. Write out one step at a time, point to photos on inhaler chart
- Take time to review inhaler use EVERY TIME.
- Most do not use correctly, some reports incorrect use (major errors) in up to 70% of patients.
- Talk about costs. Reference slide coming up.

Gregoriano C, Dieterle T, Breitenstein AL, Dürr S, Baum A, Maier S, Arnet I, Hersberger KE, Leuppi JD. Use and inhalation technique of inhaled medication in patients with asthma and COPD: data from a randomized controlled trial. Respir Res. 2018 Dec 3;19(1):237. doi: 10.1186/s12931-018-0936-3. PMID: 30509268; PMCID: PMC6276152.

Asthma Exacerbations – Treatment for MILD to MODERATE

- **Inhaled/SVN Medications:**
- **As before, start or refill and review use**
  SMART therapy or Other daily controller inhaler use
  Rescue medication – either albuterol or SABA/ICS. Have them use this Q4H while awake for 24 hours then taper to PRN as tolerated
- **Stay on all inhaled medications till they see PCP**
- **Nebulized medications are not better than inhalers when use correctly**
- **For pediatric patients send them home on budesonide nebulized solution 0.25 mg/2ml or 0.5 mg/2ml. BID for at least a week, better is till see PCP**

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Asthma Exacerbations – Treatment for MILD to MODERATE

- Nebulizers are a known quantity – this can be helpful but not better than inhalers used appropriately
- 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 mom's phone!

Asthma Exacerbations – Treatment for MILD to MODERATE

- Oral Steroids – yes most of the time
- Children – 1-2 mg/kg/day, max of 40 mg (per GINA), dose daily in the morning
- Adults – 5 days is all you need. Take QD, in the morning
  - 40 mg x 2 days then 20 mg x 3 days is plenty for most
  - For select patients have them do a patient controlled taper – 40 mg daily till they are half way better then 20 mg a day till baseline.

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Asthma Exacerbations – Treatment for MILD to MODERATE

- Taper? You are not tapering because you need to taper, you are tapering because you can
- Document that you mentioned side effects, glucose changes etc.
- Medrol Dose Packs are usually far more expensive
- Always note that good asthma care reduces PO prednisone use
- As few as three 5-day courses of prednisone (cumulative) can increase risk of complications

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Asthma Exacerbations – Treatment for MILD to MODERATE

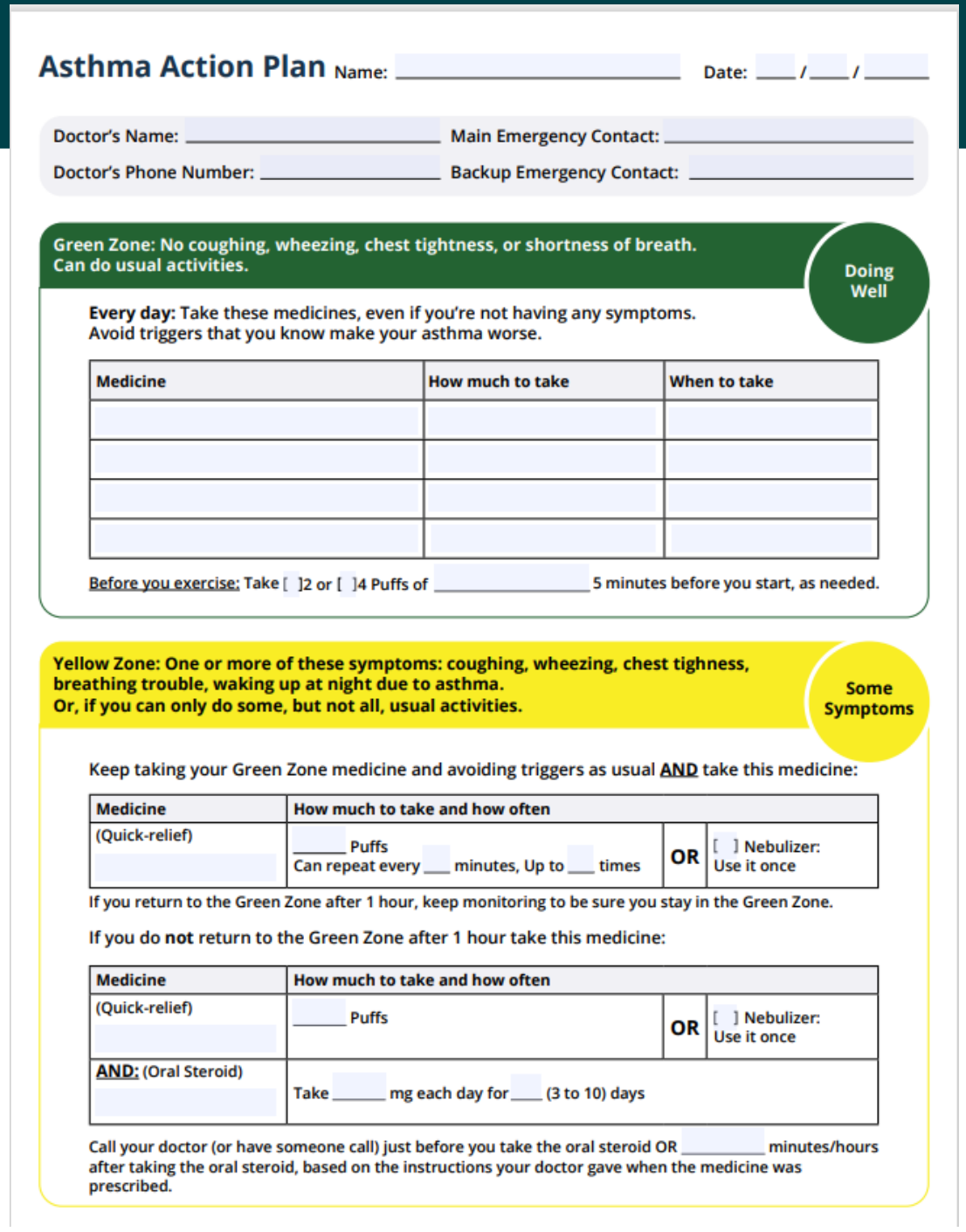
- Antibiotics – much more controversial than in COPD
- Macrolides are powerful anti-inflammatory
- GINA and US recommend no abx unless you suspect a bacterial infection
- IDSA Guidelines – more likely bacterial after 10 days, with fever or with a biphasic pattern of illness
- All the pulm that I work with give abx for severe asthma flares regardless, but data with asthma is weaker

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2024. Updated May, 2024. ginaasthma.org

Sur DKC, Plesa ML. Antibiotic Use in Acute Upper Respiratory Tract Infections. Am Fam Physician. 2022 Dec;106(6):628-636. PMID: 36521460.

Asthma Action Plan

https://www.cdc.gov/asthma/action-plan/documents/asthma-action-plan-508.pdf



Asthma Action Plan

Name: _____ Date: ___ / ___ / ___

Doctor's Name: _____ Main Emergency Contact: _____

Doctor's Phone Number: _____ Backup Emergency Contact: _____

Green Zone: No coughing, wheezing, chest tightness, or shortness of breath. Can do usual activities.

Doing Well

Every day: Take these medicines, even if you're not having any symptoms. Avoid triggers that you know make your asthma worse.

Medicine	How much to take	When to take

Before you exercise: Take [ ]2 or [ ]4 Puffs of _____ 5 minutes before you start, as needed.

Yellow Zone: One or more of these symptoms: coughing, wheezing, chest tighness, breathing trouble, waking up at night due to asthma. Or, if you can only do some, but not all, usual activities.

Some Symptoms

Keep taking your Green Zone medicine and avoiding triggers as usual **AND** take this medicine:

Medicine	How much to take and how often		
(Quick-relief)	_____ Puffs Can repeat every ___ minutes, Up to ___ times	**OR**	[ ] Nebulizer: Use it once

If you return to the Green Zone after 1 hour, keep monitoring to be sure you stay in the Green Zone.

If you do **not** return to the Green Zone after 1 hour take this medicine:

Medicine	How much to take and how often		
(Quick-relief)	_____ Puffs	**OR**	[ ] Nebulizer: Use it once
AND: (Oral Steroid)	Take _____ mg each day for ___ (3 to 10) days		

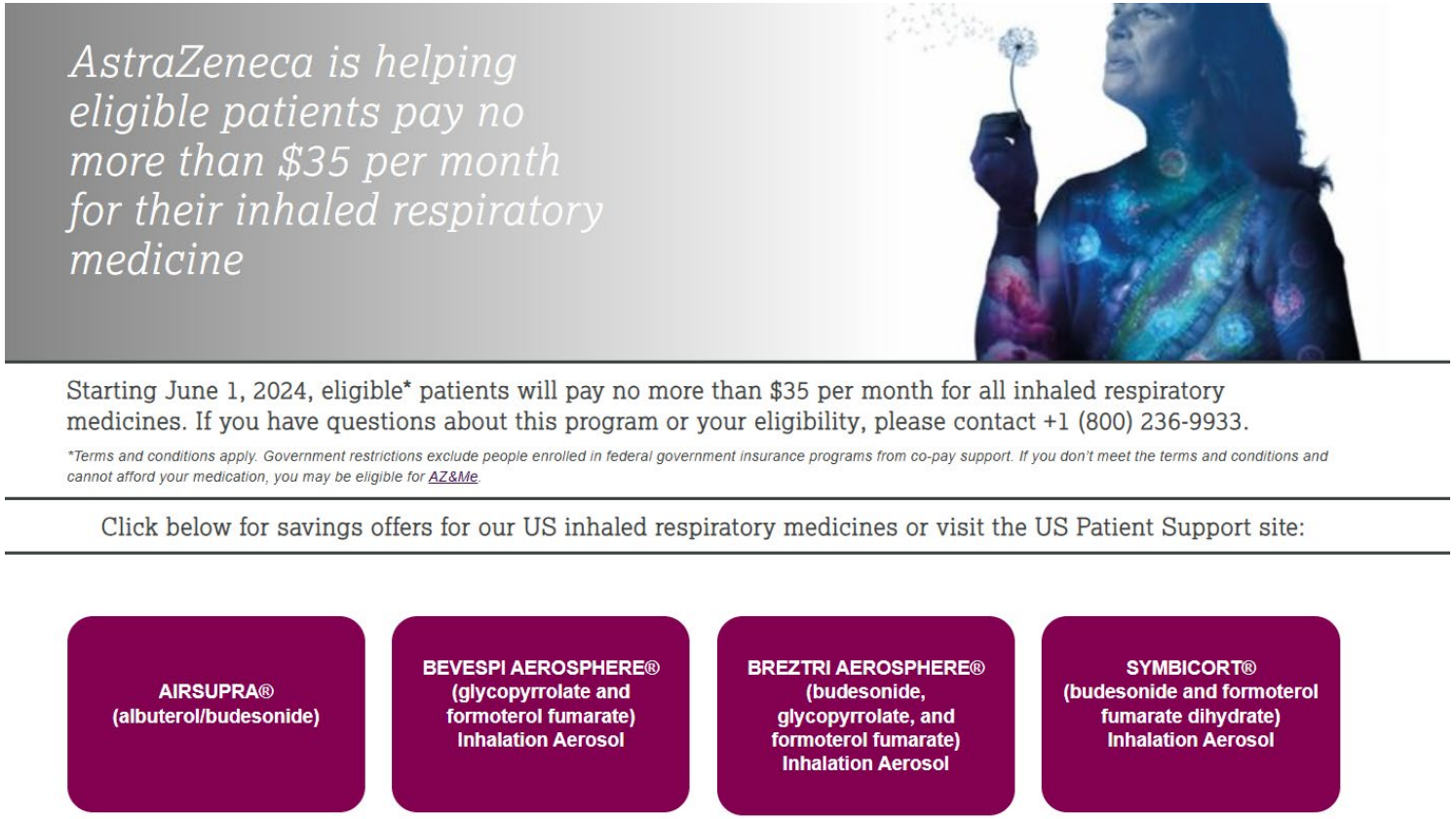
Call your doctor (or have someone call) just before you take the oral steroid OR _____ minutes/hours after taking the oral steroid, based on the instructions your doctor gave when the medicine was prescribed.

California URGENT CARE ASSOCIATION

Asthma Exacerbations – Treatment for MILD to MODERATE

- Guidelines are clear that daily therapy is key for most to control
- Make sure they can afford and know how to use their inhaler
- Exacerbations are a common reason to come to the UC
- Use Asthma Action Plans, fill out with patients, use inhaler picture charts
- Determine if they are safe to stay in the UC, if not don't delay transfer
- Treat with PO steroids most of the time, QD dosing for 5 days for most
- Consider antibiotics for those who have been sick longer or those who have not responded quickly (rule of thumb – "second visit to UC double the work up, third visit admit")
- Send them home with a controller inhaler that will KEEP them better!
- Education – asthma patients do not get sick more often than everyone else, they just have more severe symptoms and stay sick longer
- Every exacerbation is an opportunity to figure out what went wrong

AztraZeneca $35 inhalers –



You can add this right to the prescription for non-insured patients.
Patient using the $35 max cost AstraZeneca coupon:
BIN#610020 PCN#PMDI GRP#99995264 ID#4024032001

Spacer Types for Reference

Metered-Dose Inhaler with a Valved Holding Chamber (Spacer) and Mask

Metered-Dose Inhaler with a Valved Holding Chamber (Spacer)

How to Use a Metered Dose Inhaler with a Spacer and a Mask

To treat your child's asthma using a metered dose inhaler (MDI) with a spacer and a mask:

1. Remove the cap form the MDI. Look inside the spacer to make sure it is empty.
2. Shake the MDI four to five times
3. Insert the mouthpiece of the MDI into the soft rubber ring at the open end of the spacer. Make sure the MDI is pointing upwards.
4. Place the mask gently over your child's face so that his mouth and nose are covered. Be certain that there is a good seal. Your child can breathe in and out comfortably while the mask is held in place.
5. Press down on the MDI canister to release the medicine into the spacer. Keep the mask on your child's face and watch her take six breaths.
6. Wait one to three minutes before repeating steps 2 through 5 for the second puff.

Download these resources with step-by-step instructions and illustrations:

- MDI with mouthpiece form
- MDI with spacer form

American Lung Association.

How to Use a Metered-Dose Inhaler with a Valved Holding Chamber (Spacer) and Mask

Prime a brand-new inhaler: Before using it for the first time, if you have not used it for more than 7 days, or if it has been dropped.

1. Shake inhaler 10 seconds.

2. Take the cap off the inhaler. Make sure the mouthpiece and valved holding chamber are clean and there is nothing inside the mouthpiece.

3. Put inhaler mouthpiece into the open end of the chamber/spacer. Put mask onto the chamber if it is not already attached.

4. Place the mask over the individual's nose and mouth making a tight seal.

5. Press down on the inhaler once.

6. Hold mask on individual's face, while they take 6 regular breaths.

   If you need another puff of medicine, wait 1 minute and repeat steps 4-6.

7. Rinse with water and spit it out. Wipe face with damp cloth.

Proper inhalation technique is important when taking your asthma medicine(s) and monitoring your breathing. Make sure to bring all your medicines and devices to each visit with your primary care provider or pharmacist to check for correct use, or if you have trouble using them.

For more videos, handouts, tutorials and resources, visit Lung.org.

Scan the QR Code to access How-To Videos

You can also connect with a respiratory therapist for one-on-one, free support from the American Lung Association's Lung HelpLine at **1-800-LUNGUSA**.

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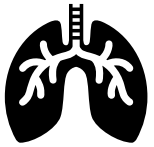
Closing Thoughts on Asthma



- Asthma is not a recurrent acute disease
- Inhalers are expensive and hard to use – this is OFTEN the biggest problem.
- Treat them with a good controller, a good rescue inhaler, short course of a PO steroid and antibiotics if severe, long duration, lack of response to initial therapy or because you just want to!
- Talk to them about getting better and then keeping them better.
- I am always available for questions – thank you!

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