ASTHMA CARE GUIDE

February 2024

CALIFORNIA CORRECTIONAL
HEALTH CARE SERVICES

Information contained in the Care Guide is not a substitute for a health care professional's clinical judgment. Evaluation and treatment should be tailored to the individual patient and the clinical circumstances. Furthermore, using this information will not guarantee a specific outcome for each patient. Refer to "Disclaimer Regarding Care Guides" for further clarification.

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GOALS

- ✓ **Classify patients by asthma severity**
- ✓ **Enter specific asthma diagnosis on Problem List**
- ✓ **Manage treatment using NAEPP EPR4-STEPWISE APPROACH[1], with SMART preferred for steps 3 and 4**
- ✓ **Add on LAMA for step 5**
- ✓ **Engage patients in their care with use of Asthma Action Plan and Asthma Control Test (ACT) as indicated**
- ✓ **Prevent exacerbations and minimize adverse effects of therapy**

ALERTS

- **Poor control: ↑ symptoms, ↑ SABA use, ↓ PEF, etc.**
- **SaO_2 < 92 %**
- **Can't speak more than one to two words per breath**
- **PEF < 50% predicted or personal best**
- **Silent chest, cyanosis, confusion**

DIAGNOSTIC CRITERIA/EVALUATION SUMMARY[2]

Asthma is a chronic disease that causes narrowing of the airways from inflammation leading to airway obstruction (bronchospasm) and airway hyper-responsiveness. **Classifying** the **severity** of a patient's asthma is the first requirement in **determining the appropriate treatment**.

Severity Classification	Intermittent	Persistent		
		Mild	Moderate	Severe
Symptom Frequency	≤ 2 days/week	> 2 days/week but not daily	Daily	Throughout the day
Nighttime Awakenings	≤ 2x/month	3-4x/month	> 1x/week but not nightly	Often 7x/week
SABA Use for Symptom Control (Not Prevention of EIB⁺)	≤ 2 days/week	> 2 days/week but not > 1x/day	Daily	Several times per day
Interference with normal Activity	None	Minor limitation	Some limitation	Extremely limited
Spirometry Lung Function	Normal FEV_1 between exacerbations; FEV_1 > 80% predicted; FEV_1/FVC* normal	FEV_1 ≥ 80% predicted FEV_1/FVC normal	FEV_1 > 60% predicted but < 80% predicted FEV_1/ FVC reduced ≤ 5%	FEV_1 < 60% predicted; FEV_1/FVC reduced > 5%

Abbreviations: EIB: exercise induced bronchoconstriction; FEV_1: forced expiratory volume in one second; FVC: forced vital capacity; ICS: inhaled corticosteroids; LABA: long-acting beta2 agonist; LAMA: long-acting muscarinic antagonist; NAEPP: National Asthma Education and Prevention Program; EPR: Expert Panel Report; PEF: peak expiratory flow; SABA: short acting beta2 agonist; SpO_2: oxygen saturation; SMART: single maintenance and reliever therapy, ICS-formoterol in a single inhaler. (Compared with other available LABAs, formoterol has a rapid onset of action and a dose range that allows for use more than twice daily.)

⁺Exercise-Induced Bronchoconstriction (EIB)[4]: formerly known as exercise-induced asthma, symptoms occur 5-15 minutes after start of exercise, and can continue for 10-15 minutes after stop of exercise. The symptoms interfere with performance and EIB usually resolve with 30–60 minutes of rest. EIB may flare when the air is cold. (See page 12)

History/Examination including:

- Medications, smoking history, hospitalizations/intubations due to asthma; known triggers; seasonal variability; vaccination history;
- Spirometry if diagnosis in question (Pre and post bronchodilator– should see ≥ 12% [and 200 ml] increase in FEV_1);
- Exam including heart and lung, complete vitals (BP, P, RR, SpO_2, T, Ht/Wt); Obtain PEF and previous PEF records (See Attachment A for Peak Flow Predicted Values) and follow-up if signs or symptoms of increased severity of asthma are noted and as needed;
- Differential diagnosis: other pulmonary diseases, cardiac disease, infectious disease, airway obstruction, etc.;
- Enter Diagnosis on Problem List (i.e., intermittent asthma, mild persistent asthma, moderate persistent asthma, etc.)

MANAGEMENT SUMMARY

- A basic principle of asthma therapy is that the intensity of treatment should match the severity of asthmatic symptoms. Thus, it is essential to classify asthma severity to initiate treatment, assess control, and subsequent adjustment and monitoring.
- Asthma control focuses on **reducing impairment** (frequency & intensity of symptoms and functional limitations); and **reducing risk** (the likelihood of future asthma attacks, progressive decline in lung function, or medication side effects). Thus, it is important to control asthma and prevent the airway obstruction.
- In 2020, National Asthma Education and Prevention Program, Fourth Expert Panel Report (NAEPP EPR-4)[1] made focused, updated recommendations to the NAEPP EPR-3 including the use of **Single Maintenance and Reliever Therapy (SMART)** as the preferred therapy for **steps 3 and 4** in the STEPWISE treatment approach (see Figure 1 on page 11). It also adds on **LAMA** to the daily medium-to high-dose ICS-LABA as the preferred **step 5** controller with an as needed SABA for relief therapy.
  In the STEPWISE approach, step up therapy if not well controlled. Review adherence to medications, inhaler technique, and comorbid conditions. Step down therapy if well controlled > 3 months on current therapy.
- **Patient education**: help patients identify their triggers and how to avoid them, smoking cessation, proper inhaler use (if indicated), Asthma Action Plan (see Patient Education PE-4) and Asthma Control Test form (see CDCR 7230, ACT Form).
- **Intermittent Asthma:** STEP 1 = SABA as needed; this was not changed in the NAEPP EPR-4 and it was not discussed in the NAEPP EPR4 because it was not included in the key questions for the panel. Global Initiative for Asthma (GINA) 2023 report does not include the distinct classification of 'intermittent asthma' because patients with so-called 'intermittent asthma' are still at risk of severe exacerbations.
- **Persistent Asthma:** Daily controller medication is needed. Consider pulmonary consult if > Step 3 care is required. See detailed steps on page 9. Some common "long-term control medications" include ICS, ICS-LABA, leukotriene receptor antagonist (LTRA), and immunomodulators.

MONITORING

FOLLOW-UP VISITS: as clinically indicated, but at least every 365 days

- Assess asthma control and adjust therapy (see Table 3 on page 14)
- Review medication technique and adherence; assess side effects; review environmental control
- Consider Asthma Control Test at asthma-related visits
- Generally, PEFs should be done at every asthma-related visit to document control
- Review Asthma Action Plan with patient, revise as needed
- If recent exacerbation, follow closely until patient is clinically improved, and at their baseline

ALGORITHM 1. ASTHMA ASSESSMENT AND TREATMENT [1, 2, 3]

Assessment (See page 7 & 8)

- History and physical, including PEF
- Confirm new diagnosis with spirometry
- Patient education including nursing verification of correct inhaler technique
- Identify triggers such as seasonal, upper respiratory infection (URI), or allergens
- Use ACT form (see CDCR 7230, ACT Form) and can be completed by patient, nurse, or PCP to assess asthma control
- Reports of Exercise Induced Bronchoconstriction (EIB) alone, without objective evidence of EIB is not an indication for continued use of SABAs or ICS

ICS Dosing:
Mometasone HFA formulation
Strengths: 100 or 200 mcg/puff
Low Dose: 100 mcg twice daily
Med Dose: 200 mcg twice daily
High Dose: 400 mcg twice daily
Consider tapering to lower dose when patient is stable

Assign Severity Classification to each patient (See pages 9-12)
(This is done at diagnosis **BEFORE starting medications**)
Document specific classification on Problem List

INTERMITTENT
- Symptoms ≤ 2 days/week
- Nighttime symptoms ≤ 2x/month
- Asymptomatic and normal FEV_1 between exacerbations
- Normal Activity Interference= None
- FEV_1 or PEF > 80% predicted (% personal best)
- SABA use ≤ 2 days/week

MILD PERSISTENT
- Symptoms > 2 days/week but not daily
- Nighttime symptoms 3-4x/month
- Normal Activity Interference= Minor
- FEV_1 or PEF ≥ 80% predicted (% personal best)
- SABA use > 2 days/week but not > 1x/day

MODERATE PERSISTENT
- Daily symptoms
- Nighttime symptoms > 1x/week but not nightly
- Normal Activity Interference= Some
- FEV_1 or PEF > 60% but < 80% predicted (% personal best)
- SABA use= daily

SEVERE PERSISTENT
- Continual symptoms
- History of intubation or ICU admission
- 2 hospitalizations in the past year for asthma
- Normal Activity Interference= Extreme
- Frequent exacerbations
- Frequent nighttime symptoms
- FEV_1 or PEF < 60% predicted (% personal best)
- SABA use= several times/day

INITIAL TREATMENT RECOMMENDATIONS BASED ON SEVERITY (See page 8)

INTERMITTENT TREATMENT*
- Generally, no ICS, unless seasonal use needed
- Rescue SABA two puffs up to four times daily as needed

MILD PERSISTENT TREATMENT
- Daily low- dose ICS and SABA as needed or
- Concomitant ICS and SABA as needed
- Consider low-dose ICS-formoterol*

MODERATE PERSISTENT TREATMENT
- Daily and as-needed combination low-dose or medium-dose ICS-Formoterol (SMART, such as Dulera®)

SEVERE PERSISTENT TREATMENT
- Daily medium- to high-dose ICS-LABA + LAMA and SABA as needed

Note Black Box warning for ICS-LABA for asthma treatment was removed by FDA in 2017, while single-ingredient LABA continued to receive this black box warning.

Controlled? — No → Re-evaluate classification; Start ICS under Mild Persistent Treatment; Follow-up closely with Primary Care Team until stable

Controlled? — Yes → Follow-up as clinically indicated (at least annually) with interval history, clinical assessment, and PEF when indicated

Controlled? — No → Re-evaluate classification; SMART for Moderate Persistent Treatment; Follow-up closely with Primary Care Team until stable

Controlled? — No → Re-evaluate classification; Step up ICS and add on LAMA to Severe Persistent Treatment; Follow-up closely with Primary Care Team until stable or consider referral to pulmonology

Controlled? — Yes → Follow-up as clinically indicated (at least annually) with interval history, clinical assessment, and PEF when indicated

Controlled? — No → Consider course of oral steroids; Consider referral to pulmonology; Follow-up very closely with PCP until at baseline, then as indicated

Spirometry if diagnosis in question

Adapted for correctional setting: NAEPP EPR-3: Guidelines for the Diagnosis and Management of Asthma, and EPR-4 focused update on EPR-3. The definition of asthma severity remained the same in the NAEPP EPR-4, while treatment for persistent asthma have updated recommendations. *: Note that GINA 2023 report did not commend the distinction between 'intermittent' and 'mild persistent' asthma, for which the preferred therapy is ICS-formoterol as needed for symptom relief; this approach may be preferred for patients with history of nonadherence to therapy and/or asthma exacerbations.

ALGORITHM 2. ACUTE EXACERBATIONS OF ASTHMA[2, 5, 6]

Initial Assessment
- Brief history – severity of symptoms, current medications, response to self-treatment, time of onset, trigger, and risk factors
- Physical Exam – PEF, heart, and respiratory rate, O_2 saturation and breath sounds

Evaluate exacerbation severity

Severe or life-threatening?

Yes

Signs/Symptoms of Severe Exacerbation
- Talks in words only, sits hunched forward, unable to talk in sentences/phrases, agitated
- Accessory muscles in use
- Wheezing (usually loud; inhalation & exhalation)
- Respiratory rate > 30/min
- Pulse > 120 bpm
- SaO_2 (on air) < 90%
- Unable to perform PEF or PEF ≤ 50% best or predicted

Signs/Symptoms of Life-Threatening Exacerbation
- Any S/S of severe asthma **AND/OR**
- Too dyspneic to speak, perspiring
- Silent chest, cyanosis, weak respiratory effort
- Bradycardia, dysrhythmia, or hypotension
- Drowsiness, exhaustion, confusion

Arrange Emergency Transport to Nearest Hospital (Call 911)
- Oxygen to achieve SaO_2 ≥ 93-95% †
- IV Access
- Prednisone 60 mg orally stat
- Inhaled high dose SABA + ipratropium continuously via oxygen driven nebulizer

PCP should see patient after discharge.** Obtain peak flows and follow closely until back to baseline peak flow and stable

No

Signs/Symptoms of Mild or Moderate Exacerbation
- Talks in phrases, prefers sitting to lying, not agitated
- Accessory muscles not used
- Respiration rate increased
- Pulse rate 100-120 bpm
- SaO_2 (on air) 90-95%
- PEF > 50% best or predicted

Treatment:
- SABA 2.5mg by nebulizer every 20 minutes up to 3 doses
- Oxygen to achieve SaO_2 ≥ 93-95%†
- Consider oral steroid (Prednisone 40-60 mg daily 5-7 days)
- Reassess response every 20 minutes for first hour

Response to above therapy?

No

Signs/Symptoms of Moderate Exacerbation
- PEF 50-79% best or predicted
- Continue SABA 2.5 mg by nebulizer every 20 minutes
- Oxygen to achieve SaO_2 ≥ 93-95% †
- Oral systemic corticosteroid: Prednisone 40-60 mg po qd for 5-7 days

Yes

Once PEF≥ 80% and sustained response for 2-4 hours after last treatment

Evaluate if patient stable for return to housing. If so:
- Continue SABA 2-4 puffs every 4 hours for 1-2 days, then as needed
- Consider oral steroid course (see above)
- Consider adding **SMART** or increasing dose of ICS
- Consider reclassifying severity if stepping up maintenance therapy***

Does patient have sustained improvement (PEF ≥ 80%) allowing return to general population housing?

No

Transfer to higher level of care if not improving or improvement not sustained

Yes

- Ensure patient has rescue SABA Inhaler
- Consider spacer
- Close follow-up with Primary Care Team member until peak flow back to baseline and patient stable on usual medication**

- Continue SABA every 4-6 hrs. as needed
- Continue oral Prednisone 40-60 mg po daily for 5-7 days
- Consider adding **SMART** or increasing dose of ICS
- Consider reclassifying severity
- Close follow-up with Primary Care Team member until peak flow back to baseline and patient stable on usual medication**

Notes:
Dosage for oral steroids: Prednisone 40-60 mg orally every day for 5-7 days. No need to taper steroids if ≤ 10 days.
* If patient has difficulty using MDI, consider using spacer.
**Patients returning from HLOC/TTA should be seen per existing CCHCS follow-up
***: Note that patients with intermittent asthma may need to initiate ICS (step 2) to prevent potential decline in lung function/future severe exacerbation
† Clinicians should be aware that some pulse oximeters may perform less accurately on dark-skinned patients. Clinical correlation is recommended.

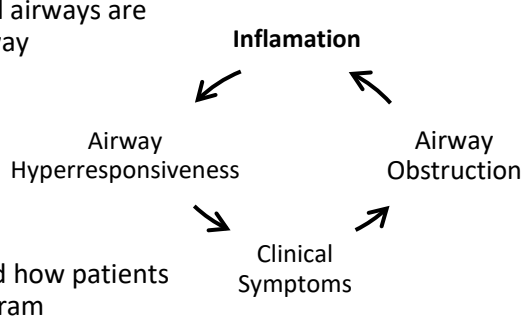
ABBREVIATIONS:
ICS: Inhaled Corticosteroid
PEF: Peak Expiratory Flow
MDI: Metered Dose Inhaler

References: UpToDate: Acute Exacerbations of asthma in adults: Home and office management, accessed in September 2023; GINA 2023 Global strategy for asthma management and prevention; Adapted for correctional setting: NAEPP EPR- 3: Guidelines for the Diagnosis and Management of Asthma.

DIAGNOSIS OF ASTHMA[3]

Asthma is a chronic disease that causes narrowing of the airways. The narrowed airways are caused by inflammation leading to airway obstruction (bronchospasm) and airway hyper-responsiveness from triggers. (i.e., inhaled allergens, irritants, etc.)
Common clinical symptoms seen in patients with asthma include:

- Wheezing
- Coughing
- Chest tightness
- Shortness of breath



The interactions of these features determine the severity of asthma present and how patients will respond to treatment. The National Asthma Education and Prevention Program (NAEPP) Expert Panel Report 3 (EPR3) Guidelines classify asthma by severity as:

- **Intermittent:** symptoms ≤ 2 days/week
- **Persistent Mild:** symptoms > 2 days/week but not daily
- **Persistent Moderate:** symptoms daily
- **Persistent Severe:** symptoms multiple times per day

The Healthcare Effectiveness Data and Information Set (HEDIS), and other quality of care measures are based on asthma severity, so it is crucial to put a specific diagnosis on the patients' Problem List. ICD10 does have the categories above which can be selected.

Evaluation

History:

- Symptoms (can be variable and recurrent): Cough, wheezing, difficulty breathing, chest tightness, are symptoms worse at night?
- Common triggers—exercise, cold air/seasonal, exposure to inhaled allergens, viral infections
- Previous history—smoking, asthma as a child, prior asthma medications, hospitalizations/intubations due to asthma, seasonal variability, vaccination history, work-related symptoms, family history of asthma and allergies, atopic symptoms such as atopic dermatitis or allergic rhinitis
- ACT replaces the previously used ACAT. The ACT is validated and includes questions that cover asthma symptoms, interference with normal activity, shortness of breath frequency, rescue inhaler or nebulizer use, and asthma control self-rating scale. It is easily scored and then used to help assess asthma control and make therapy adjustments during follow-up visits**.** Can be completed by the patient, nurse, or primary care physician to assess asthma control—baseline and subsequent visits. (See CDCR 7230 ACT Form)

Physical Exam: is often normal

- Perform exam including heart and lung (most frequent finding is wheezing on auscultation, especially on forced expiration)
- Complete vitals (BP, P, RR, SpO_2, T, Height-for PEF calculation and weight [if needed for medication dosing])
- Obtain baseline peak flow when doing well (consider peak flow at every follow-up visit) (See Attachment A for Peak Flow Predicted Values)

PEF Monitoring:

- The PEF is the maximal rate that a person can exhale during a short maximal expiratory effort after a full inspiration.
- The PEF percent predicted correlates pretty well with the percent predicted value for the forced expiratory volume in one second (FEV_1) and provides an objective measure of airflow obstruction.
- PEF also tends to correlate with the symptoms assessed by the ACT; PEF readings may show a decline in asthma control before symptoms are noticed.
- Handheld PEF devices should be available in every clinic; consider using at every asthma-related visit.

Spirometry should be considered when: making the initial diagnosis of asthma; confirming reversible airflow limitations or excluding alternative diagnoses (Refer to UpToDate Pulmonary function testing in asthma)

Note that among the various PFTs (Pulmonary Function Tests) that can be used in the diagnosis of asthma, spirometry is the most commonly used and validated tool to diagnose and monitor asthma. It allows the measurement of FEV_1, FEV, FEV_1/FVC and to see if there is airway obstruction and reversible airflow with bronchodilator, among other flow measures. Please see the Use of PFT in diagnosis of asthma and Office spirometry for more details.

Patient Education: Teach patients how to manage their asthma. (See Patient Education pages PE-1 to PE-4)

- Verification of correct inhaler (and spacer if applicable) technique, proper use of hand-held PEF device, because these skills can deteriorate rapidly.
- Self-monitoring to assess level of asthma control and recognize signs of worsening asthma (either symptom or peak flow monitoring)

DIAGNOSIS OF ASTHMA, cont'd

- Understanding what triggers their asthma and how they can avoid exposure to these triggers.
- Asthma Action Plan (See PE-4): Teach the patient how to use the plan to proactively control asthma, adjust medications in response to worsening asthma symptoms, and seek medical care when appropriate. Encourage adherence to the plan and review/update as needed. Asthma Control Test form (See CDCR 7230 ACT Form)

Differential Diagnosis

Young to middle-aged adults with asthma-like symptoms may have:	Older patients (especially cigarette smokers) may have:
• Recurrent bronchitis, bronchiolitis, or bronchiectasis • Paradoxical vocal cords (AKA laryngeal dysfunction) • Pulmonary embolism • Gastroesophageal reflux disease (GERD) • Panic disorder • Sarcoidosis (higher incidence in African-Americans) • Chronic Obstructive Pulmonary Disease (COPD) • Cough secondary to drugs (e.g., angiotensin-converting enzyme (ACE) inhibitors)	• COPD • Left-ventricular heart failure • Sarcoidosis (in addition to above, symptoms can include shortness of breath, loss of lung function, and permanent damage) • Tumors involving central airways • Recurrent oropharyngeal aspiration • Cough secondary to drugs (e.g., angiotensin-converting enzyme (ACE) inhibitors)

MANAGEMENT OF ASTHMA

The goal of asthma management is asthma control based on:

1. Reducing impairment – decreasing symptom frequency and intensity; and addressing how asthma affects the patients' daily life.
2. Reducing risk – decreasing the number of future asthma attacks, lung function decline, and medication side effects

FIRST: Classify ASTHMA SEVERITY

- Assess the patient and classify as **intermittent** OR **persistent** asthma (Classification of Asthma Severity in Table 1 and Table 2
- If the patient has **persistent** asthma, is it **mild, moderate, or severe**?

Table 1. Classification of Asthma SEVERITY in Patients NOT Currently Taking Long-Term Control Medications
(Including recently diagnosed patients and those with a past asthma diagnosis not currently on long-term control medications, adapted from NAEPP EPR-3[3])

COMPONENTS OF CONTROL	Severity Classification	Intermittent	Persistent		
			Mild	Moderate	Severe
IMPAIRMENT	**Symptom Frequency**	≤ 2 days/week	> 2 days/week but not daily	Daily	Throughout the day
	Nighttime Awakenings	≤ 2 times/month	3-4 times/month	> 1 time/week but not nightly	Often 7 times/week
	Short-acting beta2-agonist (SABA) use for symptom control (not prevention of EIB)	≤ 2 days/week	> 2 days/week but not > 1 time/day	Daily	Several times per day
	Interference with Normal Activity	None	Minor limitation	Some limitation	Extremely limited
	Lung Function	Normal FEV_1 between exacerbations FEV_1 > 80% predicted FEV_1 / FVC normal	$FEV_1 \geq 80\%$ Predicted FEV_1 / FVC normal	FEV_1 > 60% predicted but < 80% predicted FEV_1 / FVC reduced ≤ 5%	FEV_1 < 60% predicted FEV_1 / FVC reduced > 5%
RISK	**Exacerbations requiring systemic corticosteroids in the past year**	**Intermittent**	**Persistent**		
		≤ 1 time/year	≥ 2 times/year		
Note: Assign severity to the most severe category in which any feature occurs considering both impairment and risk.					

MANAGEMENT OF ASTHMA, cont'd

These two components determine whether a patient's disease burden from asthma is under clinical control. Both these components are used in determining asthma severity and asthma control. The difference is:

- **Asthma SEVERITY** is the intrinsic intensity of the disease process. It is most easily and directly measured before the start of therapy.
- **Asthma CONTROL** is the degree to which the manifestations of asthma are minimized, and the goals of therapy are met. It is assessed once treatment has been started.

Once you have determined your patient has asthma and they are not taking long-term control medications, **determine the severity** of the asthma using Table 1 (the severity category helps guide which medications to start).

- **The degree of impairment is** based on symptom frequency, number of nighttime awakenings, frequency of SABA use, degree of interference with normal activity, and lung function based on office spirometry.
- **The risk of future exacerbations is** based on the number of exacerbations over the past year. See **Table 1** for details.

For patients **who are already taking medications, including long-term control medications, asthma severity can be inferred** after patient's asthma becomes well controlled, by correlating levels of severity with the lowest level of treatment required to maintain control. However, usually the emphasis is on assessing asthma severity for initiating therapy and assessing control for monitoring and adjusting therapy.

Table 2. Classification of Asthma SEVERITY in Patients Currently Taking Medications

After asthma becomes well controlled, by lowest level of treatment required to maintain control[3]

Lowest level of treatment required to maintain control (See Figure 1, with links for treatment steps.)	Classification of Asthma Severity			
	Intermittent	Persistent		
		Mild	Moderate	Severe
	Step 1	Step 2	Step 3 or 4	Step 5 or 6

Note: See Table 3 for the classification of asthma control in patients currently taking medications.

SECOND: DOCUMENT DIAGNOSIS/SEVERITY ON PROBLEM LIST

- Enter ICD-10 diagnosis in Medical Record first on Visit Diagnosis section and "convert" to Problem List.
- Be specific: i.e., Intermittent, Mild persistent, Moderate persistent, Severe persistent asthma, etc. This affects the Quality Management Asthma Registry and the flagging of quality measures based on HEDIS. Remember there are ways to classify the severity for both patients who are not taking and who are already taking medications.

THIRD: START TREATMENT: STEPWISE APPROACH FOR MANAGING ASTHMA

- TREATMENT based on the STEPWISE APPROACH FOR MANAGING ASTHMA (See page 8 and algorithm on page 5) recommended by the NAEPP guidelines.
- Generally, start treatment based on asthma severity classification and follow closely until the patient is stable/ at baseline.
- If control is not good, "Step up" treatment, and as the patient improves can "Step down" treatment, especially if triggers have been resolved.

THIRD: START TREATMENT: STEPWISE APPROACH FOR MANAGING ASTHMA, cont'd

National Asthma Education and Prevention Program, Fourth Expert Panel Report (NAEPP EPR4)[1] published in 2020 focused on updates to the NAEPP EPR-3 guidelines. The major changes (see below) for the "stepwise asthma management" for individuals ages 12 and older include the use of **ICS-formoterol** as SMART preferred for steps 3 and 4 in the STEPWISE treatment approach (strong recommendation), due to their superior outcome in exacerbations, asthma control and quality of life, compared to the alternative therapy. Note that the classification and definition of asthma severity remained the same.

- For **step 1** (intermittent asthma), **no change was made**. Recommendations for other potential therapies for step 1, such as using combination of ICS–formoterol as needed for rescue therapy, were not made in this update because other potential therapies were not included in the key questions for the update.

- For **step 2** (mild persistent asthma), the **new preferred therapy** is either daily low-dose ICS therapy with an as needed SABA for quick-relief therapy or an as needed ICS plus a SABA used concomitantly (i.e., one after the other). Using ICS-formoterol as needed as rescue therapy was not addressed in this update because it was not included in the key questions for the update.

- For **step 3** (moderate persistent asthma), the **new preferred therapy is single maintenance and reliever therapy (SMART) with low-dose ICS–formoterol therapy** as the preferred daily controller and as needed quick-relief therapy option (strong recommendation, high certainty of evidence).

  SMART is used with a single inhaler containing both formoterol and ICS. **Formotero**l has a rapid onset of action and a dose range that allows use for more than twice daily, thus **can serve as both controller and reliever**.

  The recommended first order alternative therapy of a daily ICS–LABA with an as needed SABA for rescue therapy does not need to be changed if it is providing adequate control, but individuals whose asthma is uncontrolled by such therapy should receive the preferred SMART if possible before increasing to a higher step of therapy.

- For **step 4** (moderate-severe persistent asthma), the **new preferred therapy is SMART** therapy with medium dose ICS-formoterol as the daily controller and as needed quick-relief therapy option.

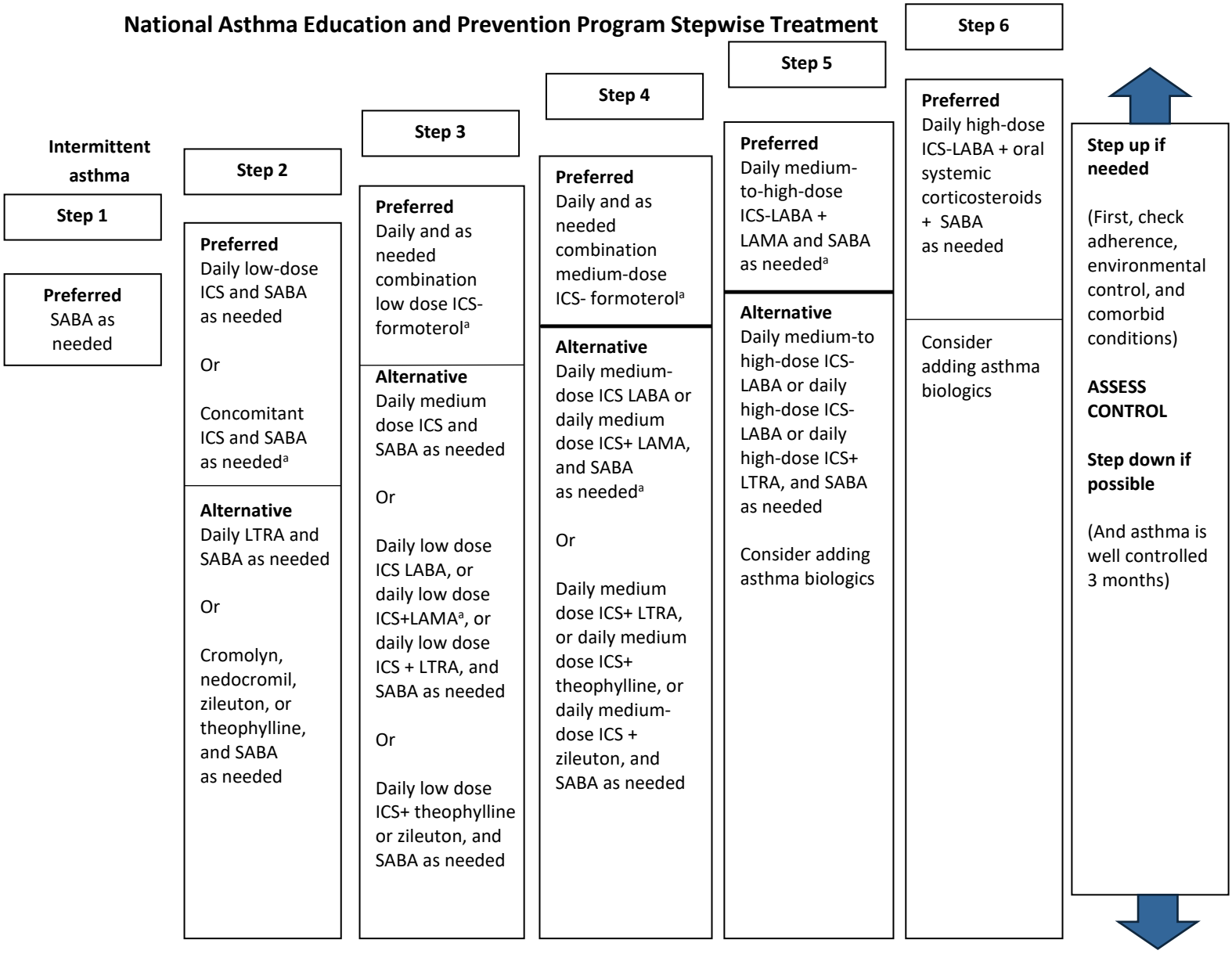
  The recommended alternate therapy of maintenance ICS-LABA along with SABA as quick-relief therapy does not need to be changed if it is providing adequate control. However, individuals whose asthma is uncontrolled on such therapy should receive the preferred SMART if possible, before stepping up their treatment to higher step of therapy.

- For **step 5** (severe asthma), the **new preferred therapy** is a daily medium to high dose ICS–LABA plus LAMA as the controller with an as needed SABA for quick-relief therapy.

- **Step 6** was not in the material reviewed by the Expert Panel for the 2020 update. The use of SMART in steps 5 and 6 was not addressed in this 2020 update because they were not included in the key questions formulated for the update.

Management of persistent asthma in adults

National Asthma Education and Prevention Program Stepwise Treatment



- **QUICK RELIEF MEDICATIONS FOR ALL PATIENTS**
  - Use SABA as needed for symptoms. Intensity of treatment depends on 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 1-2 puffs as needed with the maximum total daily dose of formoterol should not exceed 54 mcg.
  - Use of SABA > 2 days a week for symptom relief (not for prevention of EIB) generally indicates inadequate control and the need to step up treatment.
- **AT EACH STEP: PATIENT EDUCATION, ENVIRONMENTAL CONTROL, AND MANAGEMENT OF COMORBIDITIES**

Figure 1. Adapted for correctional setting, from "Managing asthma in adolescence and adults, 2020 asthma guideline update from the National asthma education and prevention program", JAMA 2020; 324 (22):2301-2317[2]. Figure on page 5.

[a] Update in the EPR-4, different from EPR-3.

MANAGEMENT OF ASTHMA, cont'd

*Note that the Global Initiative for Asthma (GINA) publishes updates annually, based on a twice-yearly review of the recently published literature by asthma clinicians and researchers around the world. The GINA report is not a formal guideline, so it does not adhere to methodologies recommended for guidelines. It has some similarities and differences with NAEPP guidelines. GINA indicated in 2021 that it does not distinguish between 'intermittent' and 'mild persistent' asthma and patients with so-called 'intermittent' asthma are still at risk for severe exacerbations. GINA 2023 includes 5 steps in the asthma treatment for adults. It recommends ICS-formoterol as the preferred therapy in all steps, including steps 1-2. It also indicated that "**GINA no longer recommends SABA-only treatment of asthma in adults**, adolescents or children 6-11 years." (GINA 2023 full report page 70) It added that "the risk of asthma exacerbations and mortality increases incrementally with higher SABA use, including in patients treated with SABA alone".*

Step up therapy if not well controlled.

- Before stepping up therapy, review adherence to medications, inhaler technique, and comorbid conditions
- Start ICS if symptoms associated with objective evidence of worsening disease (e.g., Triage and Treatment Area or Emergency Room visit with documented evidence of asthma, abnormal vital signs, decrease in peak flow with good effort, abnormal breath sounds):
  - 2 days/week of symptoms/use SABA OR 3-4 nocturnal awakenings/month OR
  - Exacerbations requiring oral steroids

Step down therapy if well controlled > 3 months on current therapy.

General Treatment:

- Treat comorbidities: (e.g., chronic rhinosinusitis, GERD, obesity, obstructive sleep apnea, depression, and anxiety, etc.)
- Consider continuing concomitant use of ICS and SABA as needed for patients with mild persistent asthma (Note that GINA 2023 full report Box 3-16 on page 83 included options to switch to **as needed low-dose ICS-formoterol** if patient's asthma is well controlled on step 2 with low-dose ICS and warned that "complete cessation of ICS in adults and adolescents is not advised as the risk of exacerbations is increased with SABA-only treatment". This may be preferred therapy for patients with history of nonadherence to therapy and/or asthma exacerbations.)
- Use spacers
- Asthma exacerbation oral steroid burst, 40-60 mg Prednisone daily for five to seven days
- Ensure smoking cessation

ACUTE EXACERBATIONS OF ASTHMA [5,6]

- Asthma exacerbations are acute or subacute episodes of progressively worsening shortness of breath, cough, wheezing, and chest tightness—or some combination of these symptoms
- Exacerbations are characterized by decreases in expiratory airflow the severity of which can be objectively documented by simple measurement of lung function (PEF or spirometry)
- PEF measurements take < 1 minute to perform, but require careful instruction to obtain reliable measurements
- For management of asthma exacerbations, see Algorithm 2 on page 6
- Risk factors for death from asthma (EPR-3)
  - Asthma history: previous severe exacerbation (e.g., intubation or ICU admission for asthma), 2 or more hospitalizations for asthma in the past year, 3 or more ED visits for asthma in the past year, Hospitalization or ED visits for asthma in the past month, using > 2 canisters of SABA per month, difficulty perceiving asthma symptoms or severity of exacerbations, lack of written asthma action plan
  - Social history: Illicit drug use, major psychosocial problems
  - Comorbidities: Cardiovascular disease, other chronic lung disease, chronic psychiatric disease

  Key: ED, emergency department; ICU, intensive care unit; SABA, short-acting beta2-agonist

SPECIAL POPULATIONS/SITUATIONS

- **EXERCISE-INDUCED BRONCHOCONSTRICTION (EIB) ASSESSMENT [4]**

  Some patients report bronchospasm/bronchoconstriction only while exercising. In the past this was called Exercise-Induced Asthma. More recently, the 2013 American Thoracic Society (ATS) practice guidelines call this condition **Exercise-Induced Bronchoconstriction (EIB)**.

  EIB is thought to be related to the release of inflammatory mediators including histamine, tryptase and leukotrienes by airway eosinophils and mast cells; and triggered by aerobic exercise.

SPECIAL POPULATIONS/SITUATIONS, cont'd

- **Diagnosis:** Usually based on history, chest tightness, pain, cough, wheezing or shortness of breath which typically occur 10–15 minutes after a brief episode of exercise or approximately 15 minutes into prolonged exercise. The symptoms interfere with performance and EIB usually resolves with 30–60 minutes of rest. EIB may flare when the air is cold. Additional workup may be indicated in equivocal cases. If symptoms persist or are not prevented by SABA use, formal pulmonary function tests may be required and or referral to specialist.
- **EIB ATS Guideline Treatment Recommendations:**
  - For patients with EIB, administer an inhaled SABA before exercise (*strong recommendation*, *high-quality evidence*). The SABA is typically administered 15 minutes before exercise.
  - For patients with EIB who continue to have symptoms despite using an inhaled SABA before exercise or who require an inhaled SABA daily or more frequently, ATS recommends adding other therapies including:
    - Daily administration of an ICS (*strong recommendation*, *moderate-quality evidence*)
      - It may take 2–4 weeks after the initiation of therapy to see maximal improvement
    - Daily leukotriene receptor antagonist is recommended (*strong recommendation*, *moderate-quality evidence*)
    - Mast cell stabilizing agent before exercise (*strong recommendation*, *high-quality evidence*)
    - Inhaled anticholinergic agent before exercise (*weak recommendation*, *low-quality evidence*)

  Summary: Use SABA 15 minutes before exercise initially. If SABA is used daily or more frequently, then add a daily inhaled ICS or a daily leukotriene receptor antagonist first (the choice between these agents is made on a case-by-case basis depending upon patient preferences and baseline lung function). Mast cell stabilizing agents and inhaled anticholinergic agents play a secondary role.

- Occupational asthma and work-aggravated asthma: Ask whether asthma symptoms are improved when they are away from work or not; eliminate exposure ASAP.
- Pregnant women: Obtain asthma history in all pregnant women and those who are planning to become pregnant; stress the importance of asthma controller treatment for the health of the mother and baby.
- Elderly patients: Asthma may be under-diagnosed due to assumptions that dyspnea is normal in old age; they are not physically fit. Asthma may be over-diagnosed due to confusion with shortness of breath from left ventricular function or ischemic heart disease.
- Smoker and ex-smokers: Asthma and COPD may co-exist (see page 16).

SPECIALTY REFERRAL GUIDELINES[7]

GENERALLY, REFER TO PULMONOLOGIST IF THE PATIENT HAS:

1. Asthma with complications or comorbidity (e.g., CO_2 retention, recent history of mechanical ventilation, FEV_1 ≤ 60% predicted at baseline, pregnancy, features suggesting of COPD)
2. Continued asthma symptoms after maximal treatment, (e.g., multiple ER visits despite therapy)
3. Chronic corticosteroid use (e.g., on oral steroids > 4 weeks, or prolonged high-dose ICS used)
4. Consider pulmonary consult if > Step 3 care is required
5. Uncertain diagnosis of asthma

Detailed and complete criteria can be found on Inter-Qual Review Manager website

FOURTH: MONITORING ASSESSING ASTHMA CONTROL & ADJUSTING THERAPY

Asthma control focuses on two components:

Reducing impairment—decreasing **current symptom frequency and intensity** and addressing how asthma affects the patient's daily life.

Reducing risk—decreasing the number of future asthma exacerbations, lung function decline, and medication side effects; the risk of future exacerbations is based on the number of serious exacerbations in the past year.

- **ACT**-includes questions that cover asthma symptoms, interference with normal activity, shortness of breath frequency, rescue inhaler or nebulizer use, and asthma control self-rating scale, replaces the prior Asthma Control Assessment Tool (ACAT). Helpful to use at asthma related visits, especially if the patient's asthma is not at baseline. (See CDCR 7230 ACT Form)

SPECIAL POPULATIONS/SITUATIONS, cont'd

- Perform Clinical Assessment and obtain PEF with hand-held device (if available) at baseline and then utilize when the patient presents with symptoms to follow treatment response and identify high risk flare.
- Determine if **ASTHMA** is **Well Controlled, Not Well Controlled, or Very Poorly Controlled—**adjust therapy as indicated.
- Follow-up closely until patient's symptoms or lung functions are at baseline, and then follow-up as clinically indicated, but at least annually.

Level of control is based on the most severe component of impairment (symptoms and functional limitations) or risk (exacerbations). Assess impairment by the patient's recall of events in Column 1 during the previous 2-4 weeks and by spirometry and/or peak flow measures, if applicable (See Attachment A for Peak Flow Predicted Values). Recommendations for adjusting therapy based on level of control are presented in the bottom row.

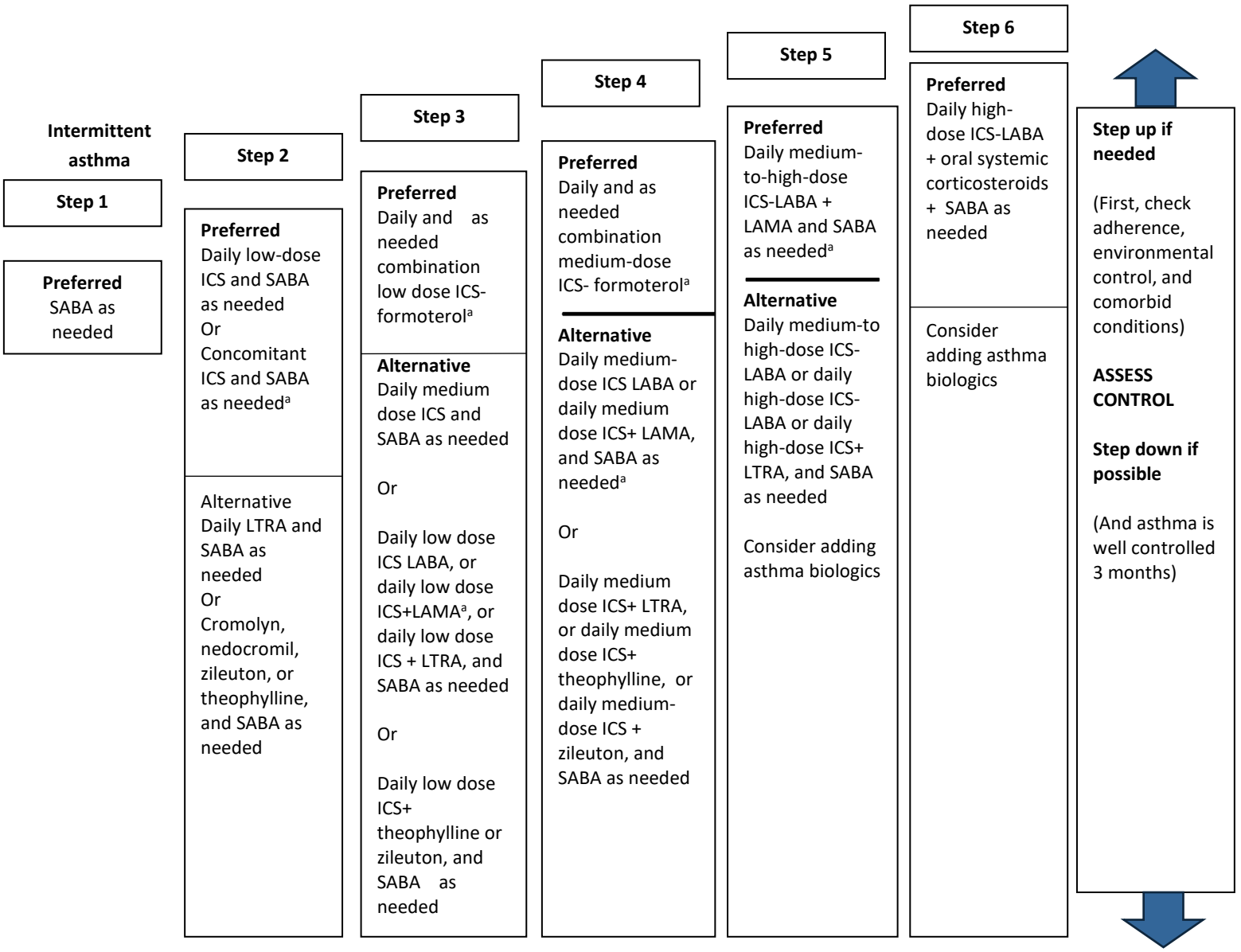
TABLE 3. Classification of Asthma CONTROL in Patients CURRENTLY Taking Medications

Adapted from NAEPP EPR3

Clinical Assessment	ASTHMA is:		
	Well controlled	**Not Well Controlled**	**Very Poorly Controlled**
Asthma Control Test (ACT) Questionnaire – adult score	**≥ 20**	**16 - 19**	**≤ 15**
Symptom Frequency	≤ 2 days/week	> 2 days/week	Throughout day
Nighttime Awakenings	≤ 2 times/month	1-3 times/week	≥ 4 times/week
SHORT-ACTING BETA2-AGONIST (SABA) USE FOR SYMPTOM CONTROL (NOT PREVENTION OF EIB)	≤ 2 days/week	> 2 days/week	Several times per day
Interference with normal activity	None	Some limitation	Extremely limited
Lung Function FEV_1 (% predicted) or peak flow (% *personal best)*	> 80%	60 - 80%	< 60%
Exacerbations requiring systemic corticosteroids	0-1 time/year	≥ 2 times/year	
Recommended Action for Treatment The stepwise approach is meant to help, not replace, the clinical decision making needed to meet individual patient needs	• Maintain current step • Regular follow-up interval (see algorithm 1 on page 5) • Consider step down if well controlled for at least 3 months	Step up 1 step Reevaluate in 2-6 weeks to achieve control Before stepping up in treatment: • Review adherence to medication, inhaler technique, and environmental control. • If alternative treatment was used, discontinue and use preferred treatment for that step. • For side effects, consider alternative treatment options.	• Consider short course of oral systemic corticosteroids • Step up 1-2 steps • Reevaluate in 2 weeks to achieve control

Management of persistent asthma in adults

National Asthma Education and Prevention Program Stepwise Treatment



- **QUICK RELIEF MEDICATIONS FOR ALL PATIENTS**
  - Use SABA as needed for symptoms. Intensity of treatment depends on 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 1-2 puffs as needed with the maximum total daily dose of formoterol should not exceed 54 mcg.
  - Use of SABA > 2 days a week for symptom relief (not for prevention of EIB) generally indicates inadequate control and the need to step up treatment.
- **AT EACH STEP: PATIENT EDUCATION, ENVIRONMENTAL CONTROL, AND MANAGEMENT OF COMORBIDITIES**

Figure 1. Adapted for correctional setting, from "Managing asthma in adolescence and adults, 2020 asthma guideline update from the National asthma education and prevention program", JAMA 2020; 324 (22):2301-2317[2]. Figure on page 5.

[a] Update in the EPR-4, different from EPR-3.

MONITORING[3,5]

FOLLOW-UP VISITS: as clinically indicated, but at least every 365 days

- Assess at each visit: asthma control, proper medication technique and adherence, written asthma action plan (if used), patient concerns.
- Obtain pulmonary function measures by spirometry at least every 1-2 years; more frequently if asthma is not well controlled.
- Determine if therapy should be adjusted, i.e., maintain treatment, step up (if needed), or step down, if possible.
- It is recommended to assess and document asthma control at every asthma-related visit at least annually. Best practice is to document an Asthma Control Test and PEF as part of the assessment.
- Review Asthma Action Plan with the patient, revise as needed.
- If recent exacerbation, follow closely until the patient is clinically improved and at their baseline.

SCHEDULE FOLLOW-UP CARE: Asthma is highly variable over time. Refer to Algorithm 1 (See page 5)

ASTHMA–COPD OVERLAP

Trying to determine whether your patient has asthma, COPD, or the so-called Asthma-COPD Overlap (ACO) can be challenging. ACO has been used by various societies, such as GOLD (Global initiative for chronic obstructive lung disease) and GINA (Global initiative for asthma), to refer to the patients with both features of asthma and COPD; in 2015 GOLD and GINA made a consensus statement on asthma, COPD, and ACO. However, GOLD indicated in its 2021 report, stating "**we no longer refer to asthma-COPD overlap** (ACO)"[8]. It emphasized that asthma and COPD are different disorders. ACO was kept in the GINA 2023 report, yet it was specified that "this is not a definition of a single disease entity". Therefore, CCHCS will highlight that **asthma and COPD are different disorders and ACO is not a single disease entity**.

The practical aspect of all these developments is that it is important to diagnose asthma and COPD accurately, and that asthma and COPD have different treatment regimens. It is true that asthma and COPD may exist in an individual patient, and **for that patient**, "**pharmacotherapy should primary follow asthma guidelines, but pharmacological and nonpharmacological approaches may also be needed for their COPD**" (GOLD 2023 report[9], page 109). The clinical phenotype and spirometry features of patients with asthma and COPD are listed in Tables 4 and 5. It is reasonable to review patient after 2-3 months of initial treatment or sooner if clinically indicated. Consider pulmonary referral if there is diagnostic uncertainty or inadequate response.

Table 4. Clinical Phenotype – Adults with Chronic Respiratory Symptoms (dyspnea, cough, chest tightness, wheeze**)**

(Adapted from GINA 2023 report[9] Box 5-2)

Highly likely to be asthma if several of the following features	**Features of both asthma + COPD**	**Likely to be COPD** If several of the following features
Treat as asthma	**Treat as asthma**	**Treat as COPD** (See COPD CG)
History • Symptoms vary over time and in intensity ○ Triggers may include laughter, exercise, allergens, seasonal ○ Onset before age 40 years ○ Symptoms improve spontaneously or with bronchodilators (minutes) or ICS (days to weeks) • Current asthma diagnosis, or asthma diagnosis in childhood	**History** • Symptoms intermittent or episodic ○ May have started before or after age 40 • May have a history of smoking and/or other toxic exposures, or history of low birth weight or respiratory illness such as tuberculosis • Any of asthma features at left (e.g., common triggers; symptoms improve spontaneously or with bronchodilators or ICS; current asthma diagnosis or asthma diagnosis in childhood)	**History** • Dyspnea persistent (most days) ○ Onset after age 40 years ○ Limitation of physical activity ○ May have been preceded by cough/sputum ○ Bronchodilator provides only limited relief • History of smoking and/other toxic exposures, or history of low birth weight or respiratory illness such as tuberculosis • No past or current diagnosis of asthma
Lung function • Variable expiratory airflow limitation • Persistent airflow limitation may be present	**Lung function** • Persistent expiratory airflow limitation • With or without bronchodilator reversibility	**Lung function** • Persistent expiratory airflow limitation • With or without bronchodilator reversibility

Table 5. SPIROMETRY IN ASTHMA AND COPD (Adapted from GINA 2023 report Box 5-3)

SPIROMETRIC VARIABLE	ASTHMA	COPD	ASTHMA+COPD
Normal FEV_1/FVC pre- or post-bronchodilator (BD)	Compatible with asthma If patient is symptomatic at a time when lung function is normal, consider alternative diagnosis.	Not compatible with COPD	Not compatible
Post-BD $FEV_1/FVC < 0.7$	Indicates airflow limitation but may improve spontaneously or on treatment	Required for diagnosis per GOLD	Required for diagnosis of asthma+COPD
Post-BD FEV_1 ≥ 80% predicted	Compatible with diagnosis of asthma (good asthma control or interval between symptoms)	Compatible with mild persistent airflow limitation (categories A or B) if post-BD FEV_1/FVC is reduced	Compatible with mild persistent airflow limitation if post-BD FEV_1/FVC is reduced
FEV_1 < 80% predicted	Compatible with diagnosis of asthma. Risk factor for asthma exacerbations	An indicator of severity of airflow limitation and risk of future events (e.g., mortality and COPD exacerbations)	An indicator of severity of airflow limitation and risk of future events (e.g., mortality and exacerbations)
Post-BD increase in FEV_1 ≥ 12% and 200 ml from baseline (reversible airflow limitation)	Usual at some time in course of asthma, but may not be present when well-controlled or on ICS-containing therapy	Common and more likely when FEV_1 is low	Common and more likely when FEV_1 is low
Post-BD increase in FEV_1 > 12% and 400 ml from baseline (marked reversibility)	High probability of asthma	Unusual in COPD	Compatible with diagnosis asthma+COPD

See 2023 GINA Main Report - Global Initiative for Asthma - GINA (ginasthma.org) Box 5-3 for details.

MEDICATIONS

Medication Class/Medication	Dosing	Adverse Effects/ Interactions*	Comments
Short-acting Beta Agonist (SABA)*			
Levalbuterol inhaled (Xopenex HFA®) **45 mcg/puff MDI with counter** **$$-$$$**	Typical dose: 1-2 puffs orally every 4-6 hours Max Dose: 2 puff every 4 hours. Higher doses may be required acutely during severe exacerbations Hepatic Dosing: not defined Renal Dosing: not defined. Renal impairment: caution advised with high dose use	Common Adverse Effects: vomiting, URI symptoms, headache, nervousness, tremor, tachycardia, palpitations, asthenia, dizziness, influenza-like symptoms, chest pain, hyperlactatemia	• Asthma rescue – NOT FOR DAILY USE. • Do not exceed the recommended doses of beta-agonists; fatalities have been reported in association with excessive use of inhaled sympathomimetic drugs in patients with asthma • Orders for SABA for asthma should include the indication. • Use with caution in patients with cardiovascular disorders including ischemic cardiac disease (coronary artery disease), hypertension, cardiac arrhythmias, tachycardia, or QT prolongation
Albuterol solution (nebulizer) **2.5 mg/3 ml** **$**	Typical dose: 2.5 mg/nebulizer treatment up to 3 to 4 times per day Max dose: 4 doses/day or 10 mg/day. Higher doses may be required acutely during severe exacerbations Hepatic/Renal Dosing: see above	See above	See above
Long-acting Beta Agonist (LABA) [Black box warning remains]**			
Salmeterol inhaled (Serevent Diskus®) 50 mcg/blister DPI **Diskus with counter** **$$$$$**	Typical dose: 50 mcg every 12 hours **Attempt taper once the patient is stable.** Do **NOT** use for acute asthma symptoms Hepatic Dosing: not defined. Hepatic impairment: caution advised Renal Dosing: not defined Do not use for acute asthma symptoms 60 doses/diskus	Common Adverse Effects: Headache, throat irritation, nasal congestion, rhinitis, tracheitis/ bronchitis, pharyngitis, urticaria, palpitations, tachycardia, tremor, nervousness	• **Black box warning:** LABAs increase risk of asthma-related death. Should only be used as adjuvant therapy in patients not adequately controlled on high dose inhaled corticosteroids or whose disease requires two maintenance therapies • Use higher doses of LABA with caution in patients with CAD, arrhythmias, or HTN. • Contraindicated in status asthmaticus • Do not use for acute asthma symptoms • Discard Diskus device 6 weeks after opening the foil pouch, when the counter reads "0", or after the expiration date on the package, whichever comes first

MEDICATIONS, cont'd

Medication Class/Medication	Dosing	Adverse Effects/ Interactions*	Comments
Inhaled Corticosteroid (ICS)			
Fluticasone inhaled (Flovent HFA®) 44, 110, 220 mcg/puff MDI with counter $$$$$	Typical dose: 2 puffs orally twice daily Low dose: 110 mcg twice daily Med dose: 220 mcg twice daily High dose: 440 mcg twice daily Hepatic Dosing: not defined. Hepatic impairment: monitor closely Renal Dosing: not defined 120 puffs/inhaler	Common Adverse Effects: URI symptoms, headache, throat irritation, candidiasis-oral, hoarseness, dysphonia, cough, nausea/vomiting, arthralgia/ myalgia, rash, pruritus, esophageal candidiasis	• Contraindicated in status asthmaticus • Do not use for acute asthma symptoms • Rinse mouth after use • Titrate to lowest effective dose once asthma controlled
Beclomethasone inhaled (QVAR®) 40, 80 cg/puff MDI with counter $$$$-$$$$$	Typical dose: 1-2 puffs orally twice daily Low dose: 40-80 mcg twice daily Med dose: 160 mcg twice daily High dose: 240-320 mcg twice daily Max 640 mcg/day Hepatic/Renal Dosing: not defined 120 puffs/inhaler	See above	• Contraindicated in status asthmaticus • Do not use for acute asthma symptoms • Rinse mouth after use • Titrate to lowest effective dose once asthma controlled • Careful observation for psychiatric decompensation is indicated in those with mental illness
Mometasone inhaled (Asmanex HFA®) **100, 200 mcg/puff MDI with counter** **$$$$**	Typical dose: 2 puffs orally twice daily (AM and PM); starting dose based on previous asthma therapy Low/Med dose: 100-200 mcg twice daily High dose: 400 mcg twice daily Titrate to lowest effective dose once asthma controlled Hepatic Dosing: not defined. Severe hepatic impairment: caution recommended Renal Dosing: not defined 120 puffs/inhaler	See above	• Contraindicated in status asthmaticus • Do not use for acute asthma symptoms • Rinse mouth after use • Titrate to lowest effective dose once asthma controlled
Long-acting Muscarinic Antagonist (LAMA)			
Tiotropium bromide inhalation spray (Spiriva® Respimat®) 1.25 mcg/spray $$$$$	Typical dose: 2 inhalations orally once daily Renal impairment: CrCl <60 mL/min – monitor for anticholinergic side effects 60 inhalations/inhaler	Common Adverse Effects: pharyngitis, headache, bronchitis, sinusitis, xerostomia Consider other treatments if paradoxical bronchospasm occurs	• Contraindicated in patients with a hypersensitivity to tiotropium, ipratropium, or any component of this product • Do not use for acute asthma symptoms • Use with caution in patients with narrow-angle glaucoma or urinary retention • Tiotropium inhalation powder (Spiriva® Handihaler®) not indicated for asthma

Bold = Formulary *See prescribing information for complete description of contraindications/precautions, adverse effects, and drug interactions. The cost scale $-$$$$$ represents the relative cost of acquisition of medication only. Frequency and complexity of medication administration (institution workload, effect on adherence) should be considered when determining overall cost-effectiveness of treatment.

**12-20-2017 FDA Drug Safety Communication: FDA review finds no significant increase in risk of serious asthma outcomes with long-acting beta agonists (LABAs) used in combination with inhaled corticosteroids (ICS). Using LABAs alone to treat asthma without an ICS to treat lung inflammation is associated with an increased risk of asthma-related death. Therefore, the Boxed Warning stating this will remain in the labels of all single-ingredient LABA medicines [10]

MEDICATIONS, cont'd

Medication Class/Medication	Dosing	Adverse Effects/ Interactions*	Comments
Corticosteroid Oral			
Prednisone tablets 5 mg, 10 mg, 20 mg (to be used in burst fashion during exacerbation) **$**	Typical dose: 40-60 mg orally daily for 5-7 days No taper needed for short treatment interval [≤ 10 days] Hepatic Dosing: not defined Renal Dosing: no adjustment	Common Adverse Effects: GI upset, psychiatric disturbances, bruising, immunosuppression, hypertension, fluid retention	• Contraindicated in systemic fungal infections; avoid administration of live or live attenuated vaccines with immunosuppressive doses of Prednisone • Careful observation for psychiatric decompensation is indicated in those with mental illness
Combination Inhaler Medications [Black box warning removed from combo ICS and LABA]**			
ICS + LABA Mometasone + formoterol (Dulera®) HFA-MDI **100 mg/5 mcg, 200 mg/5 mcg MDI with counter** **$$$$$**	Typical dose: 2 puffs orally twice daily Low/med dose: 100 mg/5 mcg 2 puffs twice daily High dose: 200 mg/5 mcg 2 puffs twice daily Hepatic Dosing: not defined Hepatic impairment: use caution Renal Dosing: not defined Do not use for acute asthma symptoms **120 puffs/inhaler**	Common Adverse Effects: Nasopharyngitis, headache, sinusitis, candidiasis oral, dysphonia Use higher doses of LABA with caution in patients with CAD, arrhythmias, or hypertension	• Typically, not started as a rescue medication. Some guidelines (i.e., GINA***) indicate it may be utilized in some cases for intermittent asthma • Attempt taper of LABA when the patient is stable for three months; consider dose reduction of ICS to lowest effective dose after LABA discontinued • Rinse mouth after use
ICS + LABA Fluticasone + salmeterol (Advair Diskus®) [100/50, 250/50, 500/50] Diskus with counter $$$$$	Typical dose: 1 puff twice daily Hepatic Dosing: not defined Renal Dosing: not defined Do not use for acute asthma symptoms 60 doses per device	ICS: see above. LABA: see above. Use higher doses of LABA with caution in patients with CAD, arrhythmias, or hypertension	• See above • Discard Diskus device 30 days after opening the foil pouch, when the counter reads "0", or after the expiration date on the package, whichever comes first
Leukotriene Receptor Antagonist (LTRA)			
Montelukast (Singulair®) **10 mg tablet** **$** **Note: Use only as alternative therapy when other therapies are not effective or tolerated and risk/benefits have been considered**	Typical dose: 10 mg orally each evening Hepatic Dosing: mild-moderate impairment: no adjustment; severe impairment: not defined Renal Dosing: no adjustment Do not use for acute asthma symptoms	Common Adverse Effects: Headache, URI symptoms, fever, influenza-like symptoms, abdominal pain, cough, diarrhea, otitis media, otitis, nausea, dyspepsia, rash/ urticarial, sleep disorders, anxiety/ irritability, restlessness, tremor	• **Black box warning:** Serious neuro-psychiatric events have been reported. Types of events reported were highly variable, and included, but not limited to, agitation, aggression, depression, sleep disturbances, suicidal thoughts and behavior (including suicide). • In patients with asthma or exercise-induced bronchoconstriction, consider the risks/benefits before prescribing. • Advise patients to report changes in behavior and mood immediately; consider alternate therapy if patients develop neuropsychiatric symptoms. • Do not use for acute asthma symptoms or acute bronchospasm. However, montelukast may be continued during the treatment of an acute asthmatic event.

Bold = Formulary *See prescribing information for complete description of contraindications/precautions, adverse effects, and drug interactions.
The cost scale $-$$$$$ represents the relative cost of acquisition of medication only. Frequency and complexity of medication administration (institution workload, effect on adherence) should be considered when determining overall cost-effectiveness of treatment.

MEDICATIONS, cont'd			
Medication Class/Medication	**Dosing**	**Adverse Effects/ Interactions***	**Comments**
Other Asthma Medications			
Theophylline 100, 200, 300, 400, 450, 600 mg ER (bronchodilator) $$$$$	Typical dose: 300-600 mg/day divided daily to twice daily Written order should contain, "asthma not controlled with inhaled corticosteroid" OR "patient adherence higher with oral regimen" Hepatic Dosing: Dose reduction and frequent monitoring of serum theophylline concentration required. Max dose: 400 mg/day Renal Dosing: no adjustment	Common Adverse Effects: nausea, vomiting, headache, insomnia, diarrhea, irritability, restlessness, tremor, transient diuresis Significant drug interactions occur with phenytoin and cimetidine	• Use with caution in patients with cardiovascular disease, especially tachyarrhythmias; hyperthyroidism; peptic ulcer disease; history of seizures: may exacerbate these conditions • Monitor for signs and symptoms of theophylline toxicity (e.g., persistent, or repetitive vomiting, tremor, tachycardia, confusion, seizures) • Careful observation for psychiatric decompensation is indicated in those with mental illness
Ipratropium inhaled (Atrovent HFA®) 17mcg/ puff **$$$$$** **Ipratropium solution: 500 mcg / 2.5 ml** **$**	Asthma exacerbation, mod-severe: 8 puffs every 20 minutes as needed for up to 3 hours (give with SABA) Hepatic Dosing: no adjustment Renal Dosing: no adjustment **200 puffs/inhaler** Nebulizer: 2.5 ml every 20 minutes for 3 doses for acute asthma in combination with SABA	Common Adverse Effects: Bronchitis, dyspnea, nausea, xerostomia, influenza-like symptoms, sinusitis, dizziness. Dyspepsia, UTI, back pain, urinary hesitancy/retention	• Used with SABA via oxygen driven nebulizer for acute asthma exacerbations • Anticholinergic effects may worsen BPH or narrow-angle glaucoma

Bold = Formulary *See prescribing information for complete description of contraindications/precautions, adverse effects, and drug interactions.

The cost scale $-$$$$$ represents the relative cost of acquisition of medication only. Frequency and complexity of medication administration (institution workload, effect on adherence) should be considered when determining overall cost-effectiveness of treatment.

Peak Flow Predicated Values for Men and Women[10]

Predicted peak expiratory flow (PEF; liters/minutes) for males aged 20 to 70					
Age (Years)	**Height**				
	60 inches/152 cm	**65 inches/165 cm**	**70 inches/178 cm**	**75 inches/191 cm**	**80 inches/203 cm**
20	477	539	606	678	784
25	484	546	613	685	756
30	488	550	616	688	759
35	487	549	616	688	758
40	483	545	611	683	754
45	474	536	603	675	746
50	462	436	591	663	733
55	446	508	575	646	717
60	426	488	554	626	697
65	402	464	530	602	673
70	374	436	503	574	645

For patients who do not know their personal best PEF, this table can help estimate an expected "personal best". This table used a prediction equation for White males, ages 20-70 years. Refer to UpToDate calculator for values for additional age, height, and race/ethnicity parameters.

Reference:

1. *Hankin JL, Odecrantz JR, Fedan KB. Spiometric values from a sample of the general U.S. population.AM J Respir Crit Care Med. 1999; 159(1);179*

Predicted peak expiratory flow (PEF; liters/minutes) for females aged 20 to 70					
Age (Years)	**Height**				
	55 inches/140 cm	**60 inches/152 cm**	**65 inches/165 cm**	**70 inches/178cm**	**75 inches/190 cm**
20	333	372	418	468	517
25	340	379	425	475	524
30	344	383	430	479	529
35	344	383	430	479	529
40	342	381	427	477	526
45	336	367	413	463	521
50	328	367	413	463	512
55	316	323	401	451	501
60	301	341	387	436	486
65	283	323	369	419	468
70	263	302	348	398	447

For patients who do not know their personal best PEF, this table can help estimate an expected "personal best". This table used a prediction equation for White females, ages 20-70 years. Refer to UpToDate calculator for values for additional age, height, and race/ethnicity parameters.

Reference:

Hankin JL, Odecrantz JR, Fedan KB. Spiometric values from a sample of the general U.S. population. AM J Respir Crit Care Med. 1999; 159(1);179

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Reference articles available upon request to m_CDADS@cdcr.ca.gov

PATIENT EDUCATION/SELF MANAGEMENT

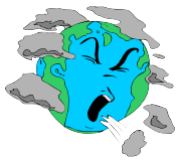
WHAT IS ASTHMA?

Asthma is a disease that affects your airways. Airways are the tubes that carry air in and out of your lungs. There are different kinds of asthma:

- **Intermittent:** You may have symptoms that come and go and are very mild. You do not need a controller inhaler, but you may sometimes need to use a rescue inhaler.
- **Persistent:** You have worse symptoms that happen more often. You need a controller inhaler to keep from having symptoms.
- **Exercise Related:** You only have symptoms when you exercise. You may need to use your rescue inhaler before starting to exercise.

WHAT CAUSES ASTHMA?

- Can be common in your family
- Is more common in people with allergies
- Pollution can either cause asthma or make it worse
- Being exposed to certain diseases as a child adds to the chance of getting asthma



WHAT ARE THE SYMPTOMS OF ASTHMA?

When you have asthma you may:

- Wheeze – make a loud or soft whistling sound when you breathe.
- Cough a lot.
- Feel short of breath.
- Have trouble sleeping because of coughing or having a hard time breathing.
- Get tired quickly during exercise.
- Have symptoms that are worse at night.

HOW IS ASTHMA DIAGNOSED?

- Your health care provider will ask you about your medical history and examine you.
- Breathing tests may be needed to see how fast or deeply you breathe. Another test tells how much air is moving in and out of your lungs.

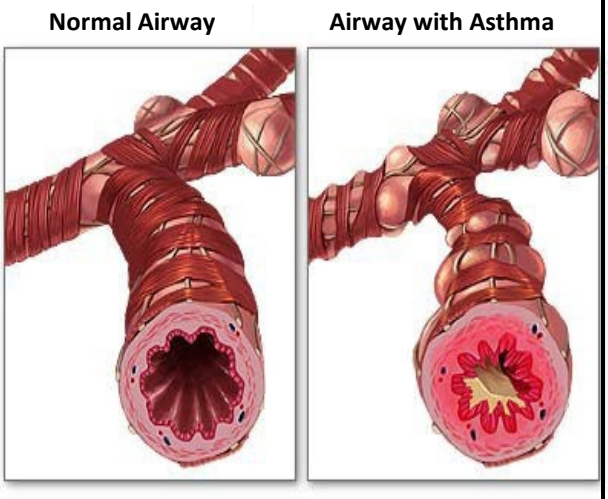
HOW IS ASTHMA TREATED?

"Relief Inhaler"- XOPENEX® (Levalbuterol) or DULERA® (formoterol)

- Works because asthma causes the muscles around your airways to tighten & get smaller which makes breathing harder.
- Tightening or narrowing of the airways can happen fast, but it can also get better fast using a rescue inhaler.
- You should only need this type of inhaler once in a while. If you are using it daily, see your health care provider.

"Controller Inhaler"– ASMANEX® OR DULERA®

- Asthma also causes long-term swelling inside the airways.
- This swelling narrows the airway and makes breathing harder.
- The swelling is there most of the time, but a controller inhaler can help keep it down and keep your airways open.
- Use your controller inhaler every day or as directed by your health care provider.



➢ Dulera® can be used both as controller and reliever medication.

PATIENT EDUCATION/SELF MANAGEMENT

HOW DO I AVOID ASTHMA ATTACKS?

- Don't Smoke.
- Be aware of things that can trigger or bring on an asthma attack and try to avoid them. Things like pollen, fumes, dust, or even strong emotions like anger, depression, or worry can bring on asthma.
- Try not to catch a cold or the flu. Wash your hands often and get a flu shot every year.
- Plan ahead and refill your prescription before it runs out.

WHAT DO I DO DURING AN ASTHMA ATTACK?

1. Use your rescue inhaler right away. XOPENEX® (Levalbuterol), or DULERA® (formoterol)
2. Sit down and loosen any tight-fitting clothing. Do not lie down.
3. If you are not breathing better right away, take one puff of your rescue inhaler every minute for five minutes or until you are breathing better.
4. If you are not breathing better in five minutes, seek medical attention immediately.

Two Ways to Use an Inhaler

Open Mouth: many doctors prefer this, but some patients find it harder

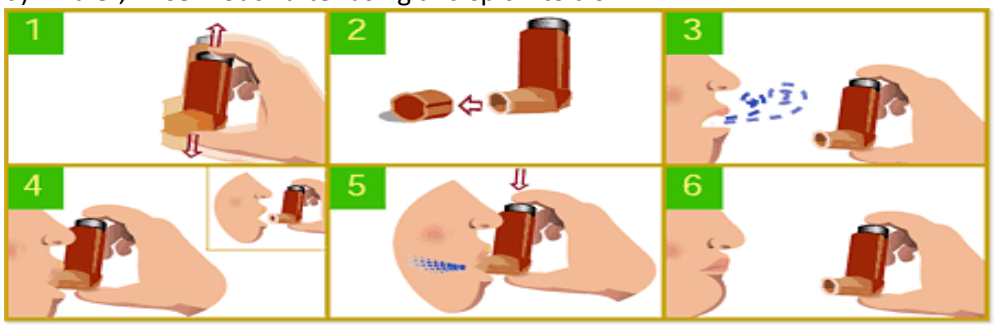
The only difference is you do not put the inhaler in your mouth (Step 4 below)

1. Shake the inhaler well before use (three or four shakes).
2. Remove the cap.
3. Breathe out, away from your inhaler.
4. Hold the inhaler about **1-2 inches from your mouth**.
5. Start to breathe in slowly through your mouth, at the same time press the top of your inhaler to spray one puff and keep breathing in slowly until you've taken a full breath.
6. Hold your breath for about 10 seconds, then breathe out slowly.

If using controller (steroid) inhaler, rinse mouth after using and spit into a sink.

Closed Mouth: Follow these six steps (See pictures 1-6)

1. Shake the inhaler well before use (three or four shakes).
2. Remove the cap.
3. Breathe out, away from your inhaler.
4. Bring the inhaler to your mouth. Place it in your mouth between your teeth and **close your mouth** around it. (Do not let tongue block the inhaler opening).
5. Start to breathe in slowly. Press the top of your inhaler to release one puff and keep breathing in slowly until you've taken a full breath.
6. Remove the inhaler from your mouth, and hold your breath for about 10 seconds, then breathe out slowly. If using controller (steroid) inhaler, rinse mouth after using and spit into a sink.



PATIENT EDUCATION/SELF MANAGEMENT

Hints: When you first use your inhaler/Cleaning your inhaler

The first time you use your inhaler (or if you have not used it in 7-10 days), point it away from you and press the top of the inhaler to spray 2-3 puffs to be sure the inhaler is working well.

To clean your XOPENEX® relief inhaler: (see below for how to clean Dulera® inhaler)

- Take the metal canister out of the plastic case
- Wash the plastic case twice a week with mild soap and water
- Rinse with running water
- Shake off excess water
- Air dry
- Put the plastic case and metal canister together when **completely dry**

To clean your daily controller (steroid) inhaler and the "SMART" med Dulera®:

- Remove the cap. Keep the canister in the case.
- Wipe the opening where the metal canister meets the plastic case with a damp cloth.

Using a Spacer

A spacer is a tube that you use with your inhaler to help the medication get into your lungs better. Not everyone needs a spacer, but if you are having trouble using your inhaler, your nurse or Primary Care Provider may recommend you use a spacer.

How to use spacer:

1. Remove the cap from the inhaler and from the spacer device.
2. Insert the inhaler into the open end of the spacer (opposite the mouthpiece). Shake well.
3. Breathe out completely.
4. Place the mouthpiece of the spacer between your teeth and seal your lips tightly around it.
5. Press the inhaler one time (one puff).
6. Breathe in slowly and completely through your mouth. If you hear a horn-like sound, you are breathing too quickly and need to slow down.
7. Hold your breath for at least 10 seconds to allow the medication to get into your lungs.
8. If your dose is more than one puff, then wait at least one minute before doing another puff.
9. When finished, remove the spacer from the inhaler, and put the caps back on the inhaler and spacer.
10. If you are using a controller (steroid) inhaler rinse your mouth with water and spit into a sink.

PATIENT EDUCATION/SELF MANAGEMENT

Asthma Action Plan

- An Asthma Action Plan is a tool used to help you track your asthma symptoms. It is also used to help give you direction on what to do when symptoms are not improving, and when you should see your health care provider. The correct use of this tool will help you control your asthma better and prepare you to control it in the community.
- There are three zones (green, yellow, and red). The green zone is where you want to be on a daily basis.
- Follow the steps in your plan, and **immediately contact medical or custody if your symptoms do not improve.**
- Work with your health care team to have Peak Flow measured and write down your values below.

Name:_____

Asthma Triggers:_____

Peak Flow Meter Personal Best:_____

Green Zone: My asthma is doing well.

Symptoms: *None. My breathing is good, no cough or wheeze, sleeps well at night*

Peak Flow Meter: _____(more than 80% of personal best)

Control Medicine(s):

Medicine	How much to take	When and how often

Physical Activity: ☐ Use albuterol/levalbuterol _____puffs, 15 minutes before activity
☐ With all activity
☐ As needed

Yellow Zone: My asthma is getting worse.

Symptoms: *Some problems breathing, cough, wheeze, or tight chest, waking at night due to asthma*

Peak Flow Meter: _____to _____(between 50% and 79% of personal best)

Quick-relief Medicine(s): ☐ albuterol/levalbuterol _____puffs, every 4 hours as needed

Control Medicine(s): ☐ Continue Green Zone medicines
☐ Add _____ ☐ Change to_____

If you do not feel back to normal after ONE hour with the above treatment: Contact Medical

Red Zone: Get Help Now!

Symptoms: *Lots of problems breathing, getting worse instead of better, medicine is not helping*

Peak Flow Meter: _____(less than 50% of personal best)

Take Quick-relief Medicine(s) NOW: ☐ albuterol/levalbuterol _____puffs, every _____

CONTACT MEDICAL/CUSTODY TO BE SEEN IMMEDIATELY!

EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

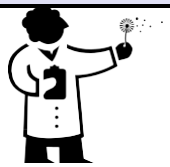
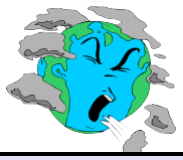
¿QUÉ ES EL ASMA?

El asma es una enfermedad que afecta sus vías respiratorias. Las vías respiratorias son los conductos que llevan el aire dentro y fuera de sus pulmones.
Hay diferentes tipos de asma:

- **Intermitente:** puede tener síntomas que aparecen y desaparecen, y sean muy leves. No necesita un inhalador de control, pero es posible que a veces necesite usar un inhalador de rescate.
- **Persistente:** presenta síntomas peores con mayor regularidad. Necesita un inhalador de control para prevenir los síntomas.
- **Relacionada con el ejercicio:** solo presenta síntomas cuando se ejercita. Es posible que necesite usar un inhalador de rescate antes de comenzar a ejercitarse.

¿QUÉ CAUSA EL ASMA?

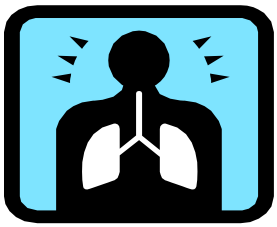
- Puede ser común en su familia.
- Es más común en personas con alergias.
- La contaminación puede causar asma o empeorarla.
- Estar expuesto a ciertas enfermedades siendo un niño aumenta la probabilidad de padecer asma.


¿CUÁLES SON LOS SÍNTOMAS DEL ASMA?

Cuando tiene asma es posible que:

- Haga un sonido de silbato cuando respire.
- Tosa mucho.
- Le falte el aire.
- Tenga problemas para dormir debido a la tos o a la dificultad para respirar.
- Se canse rápidamente al ejercitarse.
- Presente síntomas que 28unciona en la noche.



¿CÓMO SE DIAGNOSTICA EL ASMA?

- Su proveedor de atención médica le preguntará acerca de su historia clínica y lo examinará.
- Es posible que se necesiten pruebas de respiración para ver la velocidad o profundidad con las que respira. Otra prueba indica la cantidad de aire que entra y sale de sus pulmones.

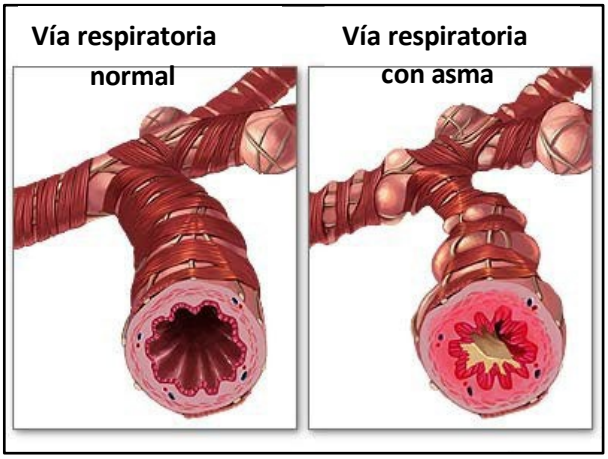
¿CÓMO SE TRATA EL ASMA?

"Inhalador de rescate"- XOPENEX® (levalbuterol) o DULERA® (formoterol)

- Funciona porque el asma provoca que los músculos alrededor de las vías respiratorias se tensen y se hagan más pequeños, lo que dificulta la respiración.
- Las vías respiratorias pueden tensarse o estrecharse muy rápido, pero también pueden aliviarse rápidamente al usar un inhalador de rescate.
- Es posible que solo necesite este tipo de inhalador de vez en cuando. Si lo usa diario, consulte a su proveedor de atención médica.

"Inhalador de control"– ASMANEX® O DULERA®

- El asma también provoca inflamación a largo plazo dentro de las vías respiratorias.
- Esta inflamación estrecha las vías respiratorias y dificulta la respiración.
- La inflamación permanece la mayor parte del tiempo, pero un inhalador de control puede ayudar a que sea leve y mantener sus vías respiratorias abiertas.
- Use su inhalador de control todos los días o como lo indique su proveedor de atención médica.



➢ Dulera® se puede utilizar tanto como medicamento controlador como aliviador.

EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

¿Cómo evito los ataques de asma?

- No fume.
- Sea consciente de aquello que puede desencadenar, o provocar, un ataque de asma e intente evitarlo. Cosas como el polen, el humo, el polvo o incluso las emociones fuertes como el enojo, la 29uncionan29 o la preocupación pueden provocar el asma.
- Procure no contagiarse de gripe o un resfriado. Lávese las manos con frecuencia y póngase una vacuna contra la gripe cada año.
- Planee y resurta sus medicamentos antes de que se acaben.

¿Qué debo hacer durante un ataque de asma?

1. Use su inhalador de rescate de inmediato. XOPENEX® (levalbuterol) o DULERA® (formoterol)
2. Siéntese y afloje cualquier ropa apretada. No se acueste.
3. Si no respira mejor de inmediato, tome un disparo de su inhalador de rescate cada minuto durante cinco minutos o hasta que respire mejor.
4. Si no respira mejor dentro de un plazo de cinco minutos, busque atención médica de inmediato.

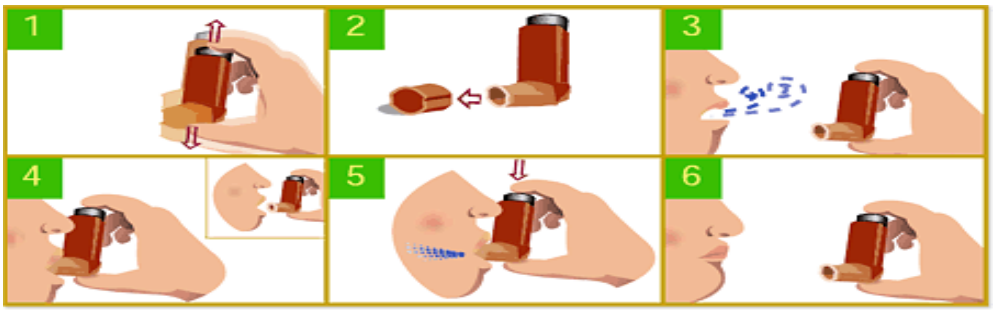
DOS MANERAS DE USAR UN INHALADOR

Con la boca abierta: muchos médicos prefieren esta manera, pero algunos pacientes creen que es más difícil.
La única diferencia es que no pone el inhalador en su boca (paso 4 a continuación).

1. Agite bien el inhalador antes de usarlo (tres o cuatro veces).
2. Quite la tapa.
3. Exhale hacia otro lugar que no sea el inhalador.
4. Coloque el inhalador a **1 o 2 pulgadas de su boca**.
5. Comience a 29uncion lentamente por su boca y, al mismo tiempo, presione la parte superior de su inhalador para disparar una dosis y seguir inhalando lentamente hasta que haya hecho una respiración 29unciona.
6. Mantenga la respiración durante 10 segundos, luego exhale despacio. Si usa un inhalador de control (esteroide), enjuague su boca luego de usarlo y escupa en un lavabo.

Con la boca cerrada: Siga estos seis pasos (vea las imágenes 1 a 6)

1. Agite bien el inhalador antes de usarlo (tres o cuatro veces).
2. Quite la tapa.
3. Exhale hacia otro lugar que no sea el inhalador.
4. Acerque el inhalador a su boca. Póngalo en su boca entre sus dientes y **cierre la boca** alrededor de él. (No permita que su lengua 29uncion la entrada del inhalador).
5. Comience a 29uncion lentamente. Presione la parte superior de su inhalador para disparar una dosis y 29unciona inhalando lentamente hasta que haya hecho una respiración 29unciona.
6. Quite el inhalador de su boca y mantenga la respiración durante 10 segundos, luego exhale despacio. Si usa un inhalador de control (esteroide), enjuague su boca luego de usarlo y escupa en un lavabo.



EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

CONSEJOS: CUANDO USE O LIMPIE POR PRIMERA VEZ SU INHALADOR

La primera vez que use su inhalador (o si no lo ha usado en 7 a 10 días), apúntelo hacia otro lugar y presione la parte superior para liberar de 2 a 3 disparos para asegurarse de que 30uncionan correctamente.

Para limpiar su inhalador <u>de rescate XOPENEX®</u>: (consulte a continuación cómo limpiar el inhaldor Dulera®)

- Saque el bote de metal del estuche de plástico.
- Lave el estuche de plástico dos veces a la semana con jabón neutro y agua.
- Enjuáguelo con agua de la llave.
- Sacúdalo para eliminar el exceso de agua.
- Déjelo secar.
- Arme el estuche de plástico y el bote de metal cuando se hayan secado por completo.

Para limpiar su inhalador <u>de control</u> (esteroide) diario <u>y el "SMART" med DULERA®:</u>

- Quite la tapa. Deje el bote en el estuche.
- Limpie la entrada donde el bote de metal se junta con el estuche de plástico con un pañuelo húmedo.

CÓMO USAR UN ESPACIADOR

Un espaciador es un tubo que se usa con el inhalador para ayudar a que el medicamento entre mejor a sus pulmones. No todos necesitan un espaciador, pero si tiene problemas para usar su inhalador, su enfermera o proveedor de atención primaria pueden recomendarle que use un espaciador.

Cómo usar un espaciador:

1. Quite la tapa del inhalador y del dispositivo espaciador.
2. Inserte el inhalador en el extremo abierto del espaciador (del lado opuesto a la boquilla). Agítelo bien.
3. Exhale completamente.
4. Ponga la boquilla del espaciador entre sus dientes y cierre los labios alrededor de ella.
5. Presione el inhalador una vez (un disparo).
6. Inhale lentamente y por completo a través de la boca. Si escucha un sonido parecido a una trompeta, está respirando demasiado rápido y necesita hacerlo más lento.
7. <u>Mantenga la respiración durante, al menos, 10 segundos</u> para permitir que el medicamento entre a sus pulmones.
8. Si su dosis es más de un disparo, espere al menos un minuto antes de hacerlo de nuevo.
9. Cuando termine, quite el espaciador del inhalador y ponga de nuevo las tapas en el inhalador y el espaciador.
10. Si usa un inhalador de control (esteroide), enjuáguese la boca con agua y escupa en un lavabo.

EDUCACIÓN PARA EL PACIENTE/CONTROL PERSONAL DEL CASO

Plan de acción contra el asma

- Un plan de acción contra el asma es una herramienta usada para ayudar a identificar sus síntomas del asma. También se usa para ayudar a darle instrucciones sobre qué hacer cuando los síntomas no mejoran y cuándo debe consultar a su proveedor de atención médica. El uso correcto de esta herramienta le ayudará a controlar mejor su asma y prepararse para controlarla en la comunidad.
- Hay tres zonas (verde, amarilla y roja). La zona verde es donde quiere estar a diario.
- Siga estos pasos de su plan y **comuníquese de inmediato con su médico o custodio si sus síntomas no mejoran**.

Nombre:_____

Desencadenantes del asma:_____

Marca personal de la medida del flujo máximo:

Zona verde: mi asma está bien.

Síntomas: *ninguno. Mi respiración está bien, no hay tos ni silbidos, duermo bien por la noche.*

Medida del flujo máximo: _____(más del 80 % de la marca personal)

Medicamentos de control: **Medicamento** **Dosis** **Cuándo y con qué frecuencia**

_____ _____
_____ _____
_____ _____

Actividad física: ☐ Use _____disparos de albuterol/levalbuterol 15 minutos antes realizar alguna actividad.
☐ Con todas las actividades.
☐ Según sea necesario.

Zona amarilla: mi asma está empeorando.

Síntomas: *algunos problemas para respirar, tos, silbidos, presión en el pecho, despertar por la noche debido al asma.*

Medida del flujo máximo: de _____a _____(entre 50 % y 79 % de la marca personal)

Medicamentos de alivio rápido: ☐ _____disparos de albuterol/levalbuterol, cada 4 horas según sea necesario.

Medicamentos de control: ☐ Siga tomando los medicamentos de la zona verde.
☐ Agregar _____ ☐ Cambiar a
_____ **Si no se siente como de costumbre después de UNA hora de realizar alguno de los tratamientos anteriores: comuníquese con su médico.**

Zona roja: ¡obtenga ayuda ahora!

Síntomas: *muchos problemas para respirar, el asma empeora en lugar de mejorar, el medicamento no ayuda.*

Medida del flujo máximo: _____(menos del 50 % de la marca personal)

Tome medicamentos de alivio rápido AHORA: _____disparos de albuterol/levalbuterol, cada _____.
COMUNÍQUESE CON SU MÉDICO O CUSTODIO PARA QUE LO ATIENDAN DE INMEDIATO!