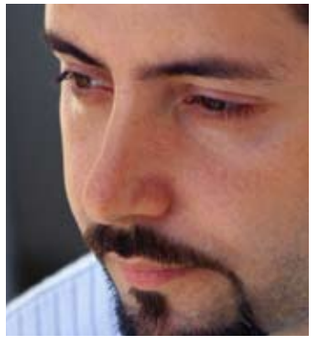

1. NIH Asthma Guidelines, 2007, Stepwise Approach for Managing Asthma in Youths≥ 12 years of Age and Adults
2. Dosage forms available on CHN formulary
3. Restricted for adult use in 1) exercise-induced asthma; 2) aspirin-sensitive asthma; 3) moderate-severe persistent asthma or uncontrolled on ICS AND LABA.
4. Maximum Age = 18; Over 18 requires PA
5. SFHP preferred Albuterol HFA MDI= Ventolin HFA or ProAir HFA
6. PA required (non-formulary), preferred Advair or inhaled steroids; current utilizers grand-fathered if member has a previous paid claim for salmeterol
7. PA required (non-formulary); current utilizers grand-fathered if member has a previous paid claim for salmeterol/fluticasone; conversions from salmeterol allowed if member has a previous paid claim for salmeterol/fluticasone; step therapy allowed from inhaled corticosteroids if member has a previous paid claim for an inhaled steroid.

CHN= Healthy San Francisco, Healthy Workers and Sliding Scale; **SFHP**= Managed Medi-Cal, Healthy Families and Healthy Kids; **MC**= Straight, FFS Medi-Cal

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San Francisco General Hospital Chest Clinic

STEPWISE APPROACH TO

Evaluating an Adult Patient for Asthma

Adapted from the NAEPP EPR-3 (National Asthma Education and Prevention Program Expert Panel Report) 2007

Step 1

Consider a diagnosis of asthma when episodic symptoms of airflow obstruction or airway hyperresponsiveness are present.

Wheezing

History of any of the following:

- ☐ **Cough** (worse particularly at night)
- ☐ **Recurrent wheeze**
- ☐ **Recurrent difficulty breathing**
- ☐ **Recurrent chest tightness**

Symptoms that occur or worsen in the presence of:

- ☐ **Exercise**
- ☐ **Inhalant allergens** (animals with fur/hair, house dust mite, mold, pollen)
- ☐ **Viral infection**
- ☐ **Irritants** (tobacco, wood smoke, airborne chemicals)
- ☐ **Weather changes**
- ☐ **Strong emotional expression** (laughing or crying hard)
- ☐ **Stress**
- ☐ **Menstrual cycles**

Symptoms occur or worsen at night, awakening the patient

Step 2

Order spirometry with bronchodilator to help establish asthma diagnosis.

(See FAQ on pfts)

Airflow obstruction that is at least partially reversible (an increase in **FEV1 of > 200mL and ≥ 12%** from baseline measure after inhalation of a short-acting B agonist) helps to establish a diagnosis of asthma.

NEXT >

Step 3

Consider differential diagnostic possibilities for asthma in adults.

- ☐ **COPD**
- ☐ **CHF**
- ☐ **Cough secondary to drugs** (ACE Inhibitors)
- ☐ **Vocal cord dysfunction**
- ☐ **Pulmonary infiltration with eosinophilia**
- ☐ **Mechanical obstruction of the airways** (benign & malignant tumors)
- ☐ **Pulmonary embolism**

NEXT >

Step 4

Be aware of diagnostic challenges:

Cough variant asthma – Cough can be the principal or only manifestation of asthma (diagnosis can be confirmed with peak flow monitoring and a positive response to medications)

Vocal cord dysfunction – Can mimic asthma but is a distinct disorder. Variable flattening of the inspiratory limb is suggestive. Asthma medications provide little relief. Diagnosis is from direct or indirect laryngoscopy.

GERD, ABPA, and OSA may coexist with asthma and complicate diagnosis.

NEXT >

Step 5

Diagnose asthma and classify its severity

(See Table 1 – Classification Of Asthma Severity)

NEXT >

Step 6

Initiate treatment

(See Table III – Recommended Treatments)

NEXT >

Step 7

On follow up, assess control and step therapy up or down

(See Table II – Classification Of Asthma Control)

National Asthma Education and Prevention Program Expert Panel Report (EPR-3) 2007 Recommendations and Level of Evidence

I. Classification of Asthma SEVERITY

First, assess SEVERITY to determine initial therapy

Normal FEV1/FVC:
8-19 years: 85%
20-39 years: 80%
40-59 years: 75%
60-80 years: 70%

Relative annual risk of exacerbations may be related to FEV1.

Assign severity to the most severe category in which any feature occurs.

Severity Components		Intermittent	Mild Persistent	Moderate Persistent	Severe Persistent
Impairment	Sxs	≤ 2 days/week	>2 days/week, not daily	Daily	Throughout the day
	Nocturnal awakenings	≤ 2x/month	3-4x/month	>1x/week, not nightly	Often, 7x/week
	SABA rescue	≤ 2 days/week	>2 days/week, not daily & not > 1x/day	Daily	Throughout the day
	Interference with normal activity	None	Minor limitation	Some	Extremely limited
Lung Function	FEV1	> 80%, nl between exacerbations	> 80%	60-80%	<60%
	FEV1/FVC	Normal	Normal	Reduced 5%	Reduced >5%
Risk	Exacerbations requiring PO steroids	0-1/year	2 or more/year		
Recommended step for initiating treatment		Step 1	Step 2	Step 3	Step 4 or 5

- Consider severity & interval since last exacerbation. Frequency & severity may fluctuate over time for patient of any severity class.
- Re-evaluate control in 2-6 weeks and adjust therapy accordingly.

Continued National Asthma Education and Prevention Program Expert Panel Report (EPR-3) 2007 Recommendations and Level of Evidence

II. Classification of Asthma CONTROL

On follow-up, assess CONTROL & step therapy up or down

Assign severity to the most severe category in which any feature occurs.

Control Components		Well-Controlled	Not Well-Controlled	Very Poorly Controlled
Impairment	Sxs	≤ 2 days/week	>2 days/week, not daily	Throughout the day
	Nocturnal awakenings	≤ 2x/month	1-3x/week	4 or more nights/week
	SABA rescue	≤ 2 days/week	>2 days/week	Several times a day
		Use of SABA > 2 days/week for symptom relief (not prevention of EIB) indicates inadequate control and need for step up in treatment.		
	Inteference with normal activity	None	Some limitation	Extremely limited
Lung Function	FEV1 or PEF	> 80%	60-80%	<60%
Risk	Exacerbations requiring PO steroids	0-1/year	2 or more/year	
	Adverse effects from Tx	Intensity of medication-related side effects should be considered in overall risk assessment although it does not correlate with specific levels of control.		
Recommended treatment action		Maintain current step; Regular f/u q1-6 months	Step up 1 step; Re-evaluate in 2-6 weeks	Consider PO steroids; Step up 1-2 steps; Re-evaluate in 2 weeks
		Consider step down if well-controlled x 3 months		

III. Recommended Treatments: Step Approach for Asthma Management

	Intermittent	Mild Persistent	Moderate Persistent	Severe Persistent		
	Step 1	**Step 2**	**Step 3**	**Step 4**	**Step 5**	**Step 6**
Preferred	SABA PRN [A]	Low-dose ICS [A]	Low-dose ICS + LABA [A] or medium-dose ICS [A]	Medium-dose ICS + LABA [B]	High-dose ICS + LABA [B] & consider omalizumab for patients with allergies [B]	High-dose ICS+LABA+ oral steroids [D] & consider omalizumab for patients with allergies [B]
Alternative		cromolyn, LTRA, or nedocromil [A], or theophylline [B]	Low-dose ICS + LTRA [A], theophylline [B], or Zileuton [D]	Medium-dose ICS + either LTRA or theophylline [B], or Zileuton [D]		
Level of evidence	**A**=randomized, controlled trials; **B**=controlled trials, no randomization; **C**=observational studies; **D**=opinion of experts					
For all patients	Patient education, environmental trigger surveillance and control, management of comorbidities					
	Provide quick relief medication. Intensity of SABA treatment depends on the severity of symptoms: up to 3 treatments at 20-minute intervals PRN					
	Short course of oral steroids may be needed.					
Chest/Chest NP referral	If: Step 4 care or higher is required, there is difficulty achieving or maintaining control of asthma, the patient required > 2 bursts of oral steroids in 1 year or had an exacerbation requiring hospitalization, omalizumab is being considered, or additional testing is needed. For patients with any asthma severity, consider referral to Chest Clinic for asthma education and smoking cessation counseling.					
Key	**SABA** (short-acting ß2 agonist), **FEV1** (forced expiratory volume 1 second), **FVC** (forced vital capacity), **ICS** (inhaled corticosteroid), **LTRA** (leukotriene receptor antagonist), **LABA** (long-acting ß2 agonist), **EIB** (exercise-induced bronchospasm)					

Asthma Medications for Adult Patients in the Community Health Network: Pocket Reference

Medication	Formulary	Dosage Form[2]	Regimen based on asthma severity using Stepwise approach[1]	Regimen for acute exacerbation
Medication Class Short-acting B-agonists (SABA) Indicated for prevention & tx of acute bronchospasm (including exercise-induced)				
Albuterol (Pro Air HFA, Proventil HFA, Ventolin HFA)	**CHN SFHP**[5]	90 mcg/inh 200 inh/MDI	2 puffs q4-6h prn 2 puffs 5-30 min prior to exercise Max: 12 puffs/day	4-8 puffs q20 min up to 4h, then q1-4h prn
		0.083% (2.5 mg/3 ml) unit dose vial	2.5mg q4-8h prn	2.5-5 mg q20min x 3 doses then 2.5-10 mg q1-4h prn or 10-15 mg/h by cont. neb.
Levalbuterol (Xopenex HFA)	**MC**	45 mcg/inh 200 inh/MDI	2 puffs q4-6h prn 2 puffs 5-30 min prior to exercise Max: 12 puffs/day	4-8 puffs q20min up to 4h, then q1-4h prn
Medication Class Short-acting anticholinergics Indicated for tx of acute bronchospasm in patients who do not tolerate SABAs.For acute exacerbations, should be added to SABA.				
Ipratropium bromide (Atrovent HFA)	**CHN SFHP**	17 mcg/inh 200 inh/MDI	2 puffs q4-6h prn Max: 12 puffs/day	8 puffs q20min prn up to 3h
		0.02% (0.5 mg/2.5 ml) unit dose vial	0.5 mg q6-8h prn	0.5 mg q20min x 3 doses then prn
Medication Class Inhaled Corticosteroids (ICS) Indicated for tx of persistent asthma.				
Beclomethasone (QVAR HFA)	**CHN SFHP MC**	40 mcg/inh 100 inh/MDI 80 mcg/inh 100 inh/MDI Administer in divided doses BID	**Mild persistent:** Step 2: Low dose: 80-240 mcg/day **Moderate persistent:** Step 3: Low dose: 80-240 mcg/day +LABA or Medium dose: >240-480 mcg/day alone **Severe persistent:** Step 4: Medium dose: >240-480 mcg/day + LABA Step 5-6: High dose: >480 mcg/day + LABA MAX DOSE: 320 mcg BID	
Budesonide (Pulmicort Flexhaler)	**CHN SFHP MC**	180 mcg/inh 120 inh/DPI Administer in divided doses BID	**Mild persistent:** Step 2: Low dose: 1-3 puffs/day **Moderate persistent:** Step 3: Low dose: 1-3 puffs/day + LABA or Medium dose: 4-6 puffs/day alone **Severe persistent:** Step 4: Medium dose: 4-6 puffs/day + LABA Step 5-6: High dose: > 7 puffs/day + LABA MAX DOSE: 4 puffs BID	
Fluticasone (Flovent HFA)	**SFHP MC**	44 mcg/inh MDI 110 mcg/inh MDI 220 mcg/inh MDI 120 inh/MDI Administer in divided doses BID	**Mild persistent:** Step 2: Low dose: 88-264 mcg/day **Moderate persistent:** Step 3: Low dose: 88-264 mcg/day + LABA or Medium dose: >264-440 mcg/day alone **Severe persistent:** Step 4: Medium dose: >264-440 mcg/day + LABA Step 5-6: High dose: > 440 mcg/day + LABA MAX DOSE: 440 mcg BID	
Medication Class Leukotriene Modifier				
Montelukast (Singulair)	**CHN**[3] **SFHP**[4] **MC**	10 mg tablet	1 tablet qhs	Not to be used for tx of acute symptoms
Medication Class Long-acting B-agonist (LABA) FDA Black Box Warning: For long-term asthma control, LABAs should always be used in combination with ICS and NOT as monotherapy.				
Salmeterol (Serevent)	*CHN SFHP NF*[6] *MC*	50 mcg/inh DPI 60 inh/diskus	**Moderate-severe persistent:** 1 inh bid, 12 h apart MAX DOSE: 1 inh BID	
Medication Class Combination LABA +ICS				
Fluticasone/ Salmeterol (Advair)	**CHN SFHP NF**[7] **MC**	100/50 per inh DPI 250/50 per inh DPI 500/50 per inh DPI 60 inh/diskus	**Moderate persistent:** Step 3: Low dose: 100/50 1 inh BID, 12 h apart **Severe persistent:** Step 4: Medium dose: 250/50 1 inh BID, 12 h apart Step 5-6: High dose: 500/50 1 inh BID, 12 h apart MAX DOSE: 1 inh BID for all dose formulations (limited by Salmeterol)	Not to be used for tx of acute symptoms