An Intermountain system-wide team comprised of Pulmonary, Allergy, and Children’s Health experts created this Care Process Model to improve and standardize asthma care. Its primary purpose is to encourage the use of evidence-based guidelines for asthma management in patients of all ages. The streamlined asthma management workflows were created using the National Heart, Lung, and Blood Institute (NHLBI) guidelines with select additions from the Global Initiative for Asthma designated as (GINA) within the document.

Initiate asthma therapy based on presenting symptoms and then step-up and step-down therapy as needed.

- Utilize newly-developed powerplans to guide age-appropriate initial dosing. Search for PUL ASTHMA in iCENTRA. Asthma steps/orders can be documented by autotext using .ambasthma
- For patients who are poorly controlled at presentation, consider starting treatment at step 3 or higher. A short course of OCS may also be appropriate.

Prescribing Single Maintenance And Reliever Therapy (SMART) is recommended for patients age 4+ with moderate persistent asthma (steps 3 and 4).

- SMART uses a single inhaler containing an ICS and formoterol as both a daily and quick-relief therapy. Examples include budesonide + formoterol (Symbicort) and mometasone + formoterol (Dulera).
- Medications NOT appropriate for SMART are ICS + salmeterol or vilanterol inhalers such as Advair, AirDuo, Wixela Inhub, or Breo Ellipta.

Consider starting ICS dosing earlier.

- A short course of ICS with PRN SABA is recommended at the beginning of an RTI in children age 0–4 years with recurrent wheezing (episodes of wheezing triggered by RTI and no symptoms between RTIs).
- Patients age 12+ with mild asthma may benefit from daily low-dose ICS with PRN SABA or PRN ICS + SABA.

What’s new in this update?

- Leukotriene Receptor antagonists (LTR’s) such as montelukast (Singular) were not considered in this guideline, though they remain an alternative option. Decreased effectiveness compared to ICS and ICS + LABA as well as the FDA boxed warning for montelukast regarding serious mood changes discourage routine usage.
- Temporarily increasing the daily ICS dose during times of reduced asthma control is not recommended by the 2020 NHLBI updated guidelines.

ICS-inhaled corticosteroids (e.g. budesonide); LABA-long-acting beta agonist (e.g. formoterol; salmeterol); OCS-oral corticosteroids (e.g. prednisolone, prednisone); PRN-as needed; RTI-respiratory tract infection; SABA-short-acting beta-agonist (e.g. albuterol, levalbuterol)
**ASTHMA MANAGEMENT AGES 0–4**

**FIRST ASSESS**
- Confirm diagnosis
- Comorbidities
- Symptom control
- Modifiable risk factors
- Inhaler technique and adherence
- Child and parent preferences and goals

**IF INITIATING TREATMENT**

**INTERMITTENT**
- Symptoms ≤2 days/week
  - No night awakenings

**MILD Persistent**
- Symptoms >2 days/week but not daily
  - Night awakenings 1–2 times/month

**MODERATE Persistent**
- Symptoms daily
  - Night awakenings 3–4 times/month

**SEvere Persistent**
- Symptoms daily
  - Night awakenings >1 time/week

**STEPWISE TREATMENT**

**Step 1**
- PRN SABA
  - At the beginning of an RTI: Add a short course of daily ICS

**Step 2**
- Daily medium-dose ICS and PRN SABA

**Step 3**
- Daily medium-dose ICS-LABA and PRN SABA
  - If 4 yrs old, use *Asthma Management Ages 5-11 (pg 3)* for steps 3 and 4

**Step 4**
- Daily high-dose ICS-LABA and PRN SABA
  - Consider adding OCS in select patients

**Step 5 & 6**
- If patient is poorly controlled at presentation

**Consider Referral to Asthma Specialist**
- Use powerplans PUL ASTHMA for dosages

**Refer to Asthma Specialist**
- Use autotext ambasthma for documentation

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*If patient is poorly controlled at presentation, consider starting at Step 3 or higher*

**Temporarily increasing the daily ICS dose during times of reduced asthma control is NOT recommended by the NHLBI updated guidelines**

ICS-inhaled corticosteroids (e.g. budesonide); LABA- long-acting beta agonist (e.g. formoterol; salmeterol); OCS- oral corticosteroids (e.g. prednisolone, prednisone); PRN-as needed; RTI- respiratory tract infection; SABA- short-acting beta-agonist (e.g. albuterol, levalbuterol);
ASTHMA MANAGEMENT AGES 5 – 11

FIRST ASSESS
- Confirm diagnosis
- Comorbidities
- Symptom control
- Modifiable risk factors
- Inhaler technique and adherence
- Child and parent preferences and goals

IF INITIATING TREATMENT

Symptoms ≤2 days / week + Night awakenings ≤2 times / month

Symptoms > 2 days / week but not daily + Night awakenings 3 – 4 times / month

Symptoms daily + Night awakenings > 1 time / week

Symptoms throughout the day + Nightly

IF INITIATING TREATMENT

Refer to asthma control tables for guidance on step-up and step-down for those on existing therapy

STEPWISE TREATMENT

Intermittent
- PRN SABA
  - Option: Low dose ICS whenever SABA is taken (GINA)

Mild Persistent
- Symptoms > 2 days / week but not daily + Night awakenings 3 – 4 times / month

Moderate Persistent
- Symptoms daily + Night awakenings > 1 time / week

Severe Persistent
- Symptoms throughout the day + Nightly

Step 1
- Daily low-dose ICS and PRN SABA

Step 2
- Step 2
  - Low-dose SMART or Daily low-dose ICS-LABA and PRN SABA
  - Option: Low dose ICS whenever SABA is taken (GINA)

Step 3
- Medium-dose SMART or Daily medium-dose ICS-LABA and PRN SABA

Step 4
- Daily high-dose ICS-LABA and PRN SABA

Step 5 & 6
- In select patients: Consider adding OCS and/or biologics

SMART
- Single Maintenance And Reliever Therapy
- Appropriate: ICS + formoterol such as budesonide + formoterol (Symbicort), or mometasone + formoterol (Dulera)
- NOT appropriate for SMART: ICS + salmeterol or vilanterol inhalers such as Advair, AirDuo, Wixela Inhub, or Breo Ellipta
- Although off-label, both NHLBI and GINA guidelines recommend SMART

Steps 5 & 6
- Daily high-dose ICS-LABA and PRN SABA

Steps 5 & 6
- In select patients: Consider adding OCS and/or biologics

If patient is poorly controlled at presentation, consider starting at Step 3 or higher
** Temporarily increasing the daily ICS dose during times of reduced asthma control is NOT recommended by the NHLBI updated guidelines

GINA- Global Initiative for Asthma; ICS- inhaled corticosteroids (e.g. budesonide); LABA- long-acting beta agonist (e.g. formoterol; salmeterol); NHLBI- National Heart, Lung, and Blood Institute; OCS- oral corticosteroids (e.g. prednisolone, prednisone); PRN- as needed; RTI- respiratory tract infection; SABA- short-acting beta-agonist (e.g. albuterol, levalbuterol); SMART- Single Maintenance an Reliever Therapy using ICS + formoterol inhaler

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ASCHMA MANAGEMENT AGES 12 – ADULT

**FIRST ASSESS**
- Confirm diagnosis
- Comorbidities
- Symptom control
- Modifiable risk factors
- Inhaler technique and adherence
- Child and parent preferences and goals

**IF INITIATING TREATMENT**

**STEPWISE TREATMENT**

**Intermittent**
- Symptoms ≤2 days/week + Night awakenings ≤2 times/month

**Mild Persistent**
- Symptoms > 2 days/week but not daily + Night awakenings 3–4 times/month

**Moderate Persistent**
- Symptoms daily + Night awakenings > 1 time/week

**Severe Persistent**
- Symptoms throughout the day + Nightly

**Step 1**
- PRN SABA

**Step 2**
- Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA
  - Option: PRN Low-dose ICS-formoterol (GINA)

**Step 3**
- Medium-dose SMART or Daily medium-dose ICS-LABA and PRN SABA

**Step 4**
- Medium-dose SMART or Daily medium-dose ICS-LABA and PRN SABA

**Steps 5 & 6**
- Daily med/high-dose ICS-LABA and PRN SABA

**Consider**
- Referral to Asthma Specialist

* If patient is poorly controlled at presentation, consider starting at Step 3 or higher

**SMART**
- Single Maintenance And Reliever Therapy
  - Appropriate: ICS + formoterol such as budesonide + formoterol (Symbicort), or mometasone + formoterol (Dulera)
  - NOT appropriate for SMART: ICS + salmeterol or vilanterol inhalers such as Advair, AirDuo, Wixela Inhub, or Breo Ellipta

Although off-label, both NHLBI and GINA guidelines recommend SMART

**Consider**
- Short course of OCS if poorly controlled at presentation **

**Refer to**
- Asthma control tables for guidance on step-up and step-down for those on existing therapy

**Use**
- Powerplans PUL ASTHMA for dosages
- Autotext ambasthma for documentation

**GINA** - Global Initiative for Asthma; **ICS** - inhaled corticosteroids (e.g. budesonide); **LABA** - long-acting beta agonist (e.g. formoterol; salmeterol); **LAMA** - long-acting muscarinic antagonists; **NHLBI** - National Heart, Lung, and Blood Institute; **OCS** - oral corticosteroids (e.g. prednisolone, prednisone); PRN - as needed; RTI - respiratory tract infection; **SABA** - short-acting beta-agonist (e.g. albuterol, levalbuterol); **SMART** - Single Maintenance an Reliever Therapy using ICS + formoterol inhaler

**Consider**
- Referral to Asthma Specialist

* If patient is poorly controlled at presentation, consider starting at Step 3 or higher

**Temporarily increasing the daily ICS dose during times of reduced asthma control is NOT recommended by the NHLBI updated guidelines**
This CPM presents a model of best care based on the best available scientific evidence at the time of publication. It is not a prescription for every physician or every patient, nor does it replace clinical judgment. All statements, protocols, and recommendations herein are viewed as transitory and iterative. Although physicians are encouraged to follow the CPM to help focus on and measure quality, deviations are a means for discovering improvements in patient care and expanding the knowledge base. Send feedback to Peter Crossno, MD; Associate Medical Director of Pulmonary and Respiratory Care, Intermountain Healthcare; peter.crossno@imail.org.

### Table 1: CPM Responsibility Matrix

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