FIGURE 13. STEPWISE APPROACH FOR MANAGING ASTHMA LONG TERM IN CHILDREN, 0–4 YEARS OF AGE AND 5–11 YEARS OF AGE

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Intermittent Asthma</th>
<th>Preferred</th>
<th>Intermittent Asthma</th>
<th>Persistent Asthma: Daily Medication</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4 yrs</td>
<td>SABA PRN</td>
<td>Low-dose ICS</td>
<td>Medium-dose ICS</td>
<td>Medium-dose ICS</td>
<td>High-dose ICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ LABA</td>
<td>+ LABA or Montelukast</td>
<td>+ LABA or Montelukast</td>
<td>+ LABA or Montelukast</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ Montelukast</td>
<td>+ Montelukast</td>
<td>+ Montelukast</td>
<td>+ Montelukast</td>
</tr>
</tbody>
</table>

**Children 0–4 Years of Age**

**Quick-Relief Medication**
- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms.
- With viral respiratory symptoms: SABA 4–6 hours up to 24 hours (longer with physician consult). Consider short course of oral systemic corticosteroids if exacerbation is severe or patient has history of previous severe exacerbations.

**Caution:** Frequent use of SABA may indicate the need to step up treatment. See text for recommendations on initiating daily long-term control therapy.

**Patient Education and Environmental Control**

**Children 5–11 Years of Age**

**Quick-Relief Medication**
- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms. Up to 3 treatments at 20-minute intervals as needed. Short course of oral systemic corticosteroids may be needed.

**Caution:** Increasing use of SABA or use >2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and the need to step up treatment.

**Step 2**
- Consult with asthma specialist if step 3 care or higher is needed. Consider consultation at step 2.

**Step 3**
- **Preferred:** CAF, LABA, or ICS with LABA.
- **Alternative:** CAF, LABA, or ICS with LABA.

**Step 4**
- **Preferred:** High-dose ICS alone or LABA + ICS.
- **Alternative:** High-dose ICS alone or LABA + ICS.

**Step 5**
- **Preferred:** High-dose ICS alone.
- **Alternative:** High-dose ICS alone.

**Step 6**
- **Preferred:** High-dose ICS alone.
- **Alternative:** High-dose ICS alone.

**Notes**
- The stepwise approach is meant to assist, not replace, the clinical decision making required to meet individual patient needs.
- If an alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- If clear benefit is not observed within 4–6 weeks, and patient/family’s medication technique and adherence are satisfactory, consider adjusting therapy or an alternative diagnosis.
- Studies on children 0–4 years of age are limited. Step 2 preferred therapy is based on Evidence A. All other recommendations are based on expert opinion and extrapolation from studies in older children.
- Clinicians who administer immunotherapy should be prepared and equipped to identify and treat anaphylaxis that may occur.

**Key:** Alphabetical listing is used when more than one treatment option is listed within either preferred or alternative therapy. ICS, inhaled corticosteroid; LABA, inhaled long-acting beta-agonist; LTRA, leukotriene receptor antagonist; oral corticosteroids, oral systemic corticosteroids; SABA, inhaled short-acting beta-agonist.
FIGURE 16. STEPWISE APPROACH FOR MANAGING ASTHMA IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

Key: Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy. ICS, inhaled corticosteroid; LABA, long-acting inhaled beta2-agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta2-agonist

Notes:
- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- Zileuton is a less desirable alternative due to limited studies as adjunctive therapy and the need to monitor liver function. Theophylline requires monitoring of serum concentration levels.
- In step 6, before oral corticosteroids are introduced, a trial of high-dose ICS + LABA + either LTRA, theophylline, or zileuton may be considered, although this approach has not been studied in clinical trials.
- Step 1, 2, and 3 preferred therapies are based on Evidence A; step 3 alternative therapy is based on Evidence A for LTRA, Evidence B for theophylline, and Evidence D for zileuton. Step 4 preferred therapy is based on Evidence B, and alternative therapy is based on Evidence B for LTRA and theophylline and Evidence D for zileuton. Step 5 preferred therapy is based on Evidence B. Step 6 preferred therapy is based on (EPR—2 1997) and Evidence B for omalizumab.
- Immunotherapy for steps 2–4 is based on Evidence B for house-dust mites, animal danders, and pollens; evidence is weak or lacking for molds and cockroaches. Evidence is strongest for immunotherapy with single allergens. The role of allergy in asthma is greater in children than in adults.
- Clinicians who administer immunotherapy or omalizumab should be prepared and equipped to identify and treat anaphylaxis that may occur.

Intermittent Asthma

Persistent Asthma: Daily Medication
- Consult with asthma specialist if step 4 care or higher is required.
- Consider consultation at step 3.

Step 1
- Preferred: SABA PRN
- Alternative: Cromolyn, LTRA, Nedocromil, or Theophylline

Step 2
- Preferred: Low-dose ICS

Step 3
- Preferred: Medium-dose ICS + LABA
- Alternative: Medium-dose ICS + either LTRA, Theophylline, or Zileuton

Step 4
- Preferred: High-dose ICS + LABA

Step 5
- Preferred: High-dose ICS + LABA + oral corticosteroid
- AND
- Consider Omalizumab for patients who have allergies

Step 6
- Step up if needed
- (first, check adherence, environmental control, and comorbid conditions)
- Assess control
- Step down if possible
- (and asthma is well controlled at least 3 months)

Quick-Relief Medication for All Patients
- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms: up to 3 treatments at 20-minute intervals as needed. Short course of oral systemic corticosteroids may be needed.
- Use of SABA ≥2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and the need to step up treatment.

Each step: Patient education, environmental control, and management of comorbidities.
Steps 2–4: Consider subcutaneous allergen immunotherapy for patients who have allergic asthma (see notes).