Asthma Echo Program
GINA Guideline Update and Discussion

Terri Magruder, MD, MPH

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GINA 2025

- WHO and NHLBI collaborated to develop GINA in 1993
- It is a global evidenced based strategy that can be adapted for local health systems
  - Careful attention to study design, population and clinical relevance
- Updated ***annually***
- Resource: https://ginasthma.org/pocket-guide-for-asthma-management-and-prevention/

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

Common themes of GINA and NHLBI are chronic disease management, shared decision-making, and movement towards combining ICS with SABA or Formoterol for quick relief

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Key Updates

- Type 2 Biomarkers
- Personalized Treatment
- Reinforcing shift away from bronchodilators alone
- Difficult to treat/Severe asthma
- Treatment of exacerbations

Type 2 Biomarkers

- Role of Type 2 Biomarkers
  - Blood eosinophils
  - FeNO: fractional exhaled nitrous oxide
    - > 50ppb for adults and >35ppb for children
- Role
  - Support diagnosis, but don't rule in or out asthma
  - Identify high-risk patients
  - Determine next steps in treatment

Population-level vs patient-level treatment decisions

Choosing between treatment options at a population level

(e.g., national formularies, health maintenance organizations, national guidelines)

The 'preferred' medication at each step is the best treatment for most patients, based on:

- **Efficacy**
- **Effectiveness**
- **Safety**

Mainly based on evidence about symptoms and exacerbations (from randomized controlled trials, pragmatic studies and strong observational data)

- **Access**

Population-level availability and cost

There are different population-level recommendations by age-group (adults/adolescents, children 6–11 years, children 5 years and younger). For patients with severe asthma, there are also different population-level recommendations depending on the inflammatory phenotype.

Choosing between controller options for individual patients

Use shared decision-making with the patient or parent/caregiver to discuss the following:

1. Preferred medication

- What is the best medication for symptom control and risk reduction (as above)?

2. Patient characteristics or phenotype

- Does the patient have any factors that predict differences in risk or treatment response, compared with other patients, e.g., smoking; SABA over-use; exacerbation history; high FeNO or eosinophils; environmental exposures; comorbidities?

3. Patient views

- What are the patient's goals, beliefs and concerns about asthma and its treatment?

4. Practical issues

- For the preferred medication(s), which inhalers are available to this patient?
- Can they use the inhaler correctly after training?
- Can they afford the medication?
- Adherence – how often are they likely to take the medication?
- If more than one inhaler is suitable for the patient, which has the lowest environmental impact?

FeNO: fractional exhaled nitric oxide; SABA: short-acting $beta_2$-agonist

Personalized asthma management

- Building relationships and shared decision making
- Action plans provide standardization and consistent messaging from visit to visit
- Patient education is the key to getting the treatment plan in action
  - Prioritize medications, simplify plans
  - Be clear about medication use and expectations for treatment
  - Use Teach Back method to confirm understanding
  - Device education and review important at all visits
  - Using pictures to explain medication or asthma disease concepts
- Scheduled follow up visit and standardized disease control assessment
  - Validated questionnaires ACT and/or ACQ recommended
- School forms
- Review, Assess, Adjust
  - Adherence needs to be addressed at all visits
    - Normalize non-adherence to create an open environment to discuss medications and patient concerns

Why not treat with inhaled short-acting beta$_2$-agonists (SABA) alone?

- People with apparently mild asthma can have severe or fatal exacerbations *(Dusser et al, 2007)*
- Even 4–5 lifetime OCS courses increase the cumulative risk of adverse events including osteoporosis, diabetes, cataract, heart failure, pneumonia *(Price et al, J Asthma Allerg 2018)*
- Regular use of SABA for 1–2 weeks is associated with increased airway hyperresponsiveness, reduced bronchodilator effect, increased allergic response, increased eosinophils *(e.g. Cockcroft 2006)* → vicious cycle of increasing use
- SABA over-use is associated with ↑ exacerbations and ↑ mortality *(e.g. Suissa 1994, Nwaru 2020)*
- Starting treatment with SABA **trains** the patient to regard it as their primary asthma treatment
  - → Poor adherence with ICS is almost inevitable

There is strong evidence for a more effective and safer alternative: as-needed ICS-formoterol

ICS: inhaled corticosteroids; OCS: oral corticosteroids; SABA: short-acting beta$_2$-agonist

Diagnosis of asthma in children aged 5 years and younger

1

Recurrent acute wheezing episodes

OR

At least 1 acute wheezing episode with asthma-like symptoms between episodes

+

2

No likely alternative cause for the respiratory symptoms

+

3

Timely clinical response of respiratory symptoms or signs to asthma medications

Any of:

- **Short-term response to SABA** within minutes during acute wheezing episode in healthcare setting (or, for more severe episode, within 3-4 hours after SABA and OCS started)
- **Short-term response to SABA at home** (within minutes)
- **Reduced frequency or severity** of acute wheezing episodes and/or of symptoms between episodes during 2–3 months' trial of daily ICS

All three criteria are needed for the diagnosis of asthma in children 5 years and younger

Acute wheezing episode: symptoms such as wheezing on expiration, accessory muscle use, or difficult, fast or heavy breathing, lasting for more than 24 hours

Asthma-like symptoms between episodes (also called *interval symptoms*): symptoms such as dry cough or wheeze after running, laughing or crying, or during sleep, that occur between acute wheezing episodes

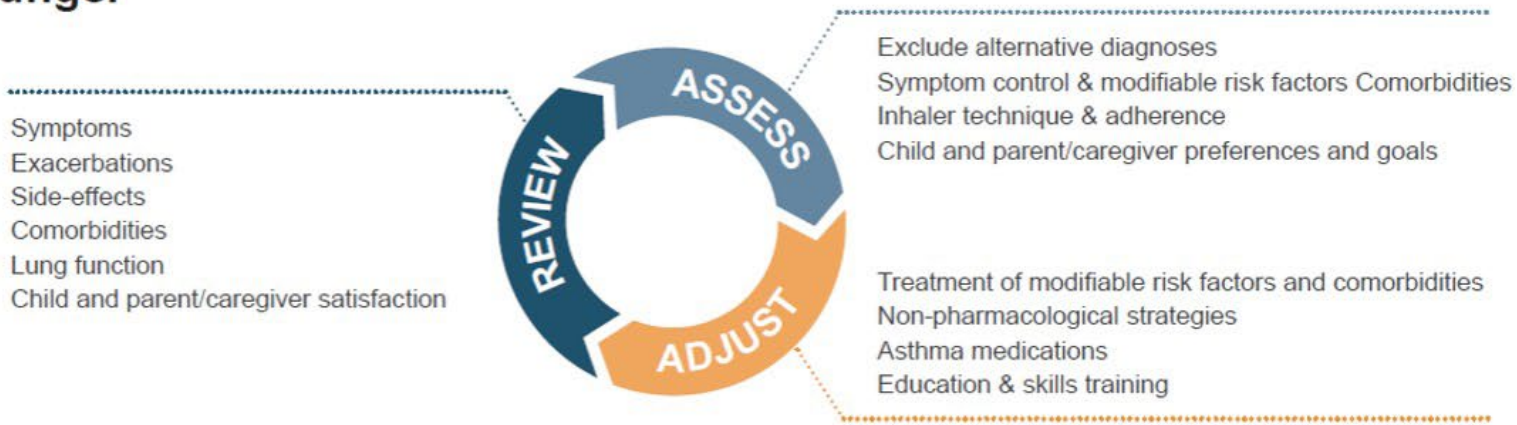
If only 1 or 2 criteria are met, describe as 'suspected asthma', and continue follow-up

A personal or family history of allergic disease may strengthen the diagnosis of asthma, but is not required, and is not specific for asthma

ICS: inhaled corticosteroid; OCS: oral corticosteroid; SABA: short-acting beta$_2$-agonist

GINA 2025
Children 5 years and younger

Personalized asthma management:
Assess, Adjust, Review response



Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4
PREFERRED CONTROLLER CHOICE	*(Insufficient evidence for daily controller)*	Daily low dose inhaled corticosteroid (ICS) (see Box 11-3 for ICS dose ranges for pre-school children)	Double 'low dose' ICS *(See Box 11-3)*	Continue controller & refer for specialist assessment
Other controller options (limited indications, or less evidence for efficacy or safety)	*Consider intermittent short course ICS at onset of viral illness*	*Daily leukotriene receptor antagonist (LTRA†), or intermittent short course of ICS at onset of respiratory illness*	*Consider specialist referral*	
RELIEVER	As-needed short-acting beta$_2$-agonist			
CONSIDER THIS STEP FOR CHILDREN WITH:	Infrequent acute (e.g viral-induced) wheezing episodes and no or minimal interval asthma symptoms	Asthma symptoms not well-controlled (Box 11-1), or one or more severe exacerbations in the past year	Asthma not well controlled on low dose ICS	Asthma not well controlled on double ICS
			Before stepping up, check for alternative diagnosis and inhaler skills, review adherence and exposures	

ICS: inhaled corticosteroid; LTRA: leukotriene receptor antagonist (†advise about risk of neuropsychiatric adverse effects; SABA: short-acting beta$_2$-agonist

GINA 2025
Children 6–11 years

Personalized asthma management:
Assess, Adjust, Review

Symptoms
Exacerbations
Side-effects
Comorbidities
Lung function
Child and parent/caregiver satisfaction

Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors
Comorbidities
Inhaler technique & adherence
Child and parent/caregiver preferences and goals

Treatment of modifiable risk factors and comorbidities
Non-pharmacological strategies
Asthma medications including ICS
Education & skills training, action plan

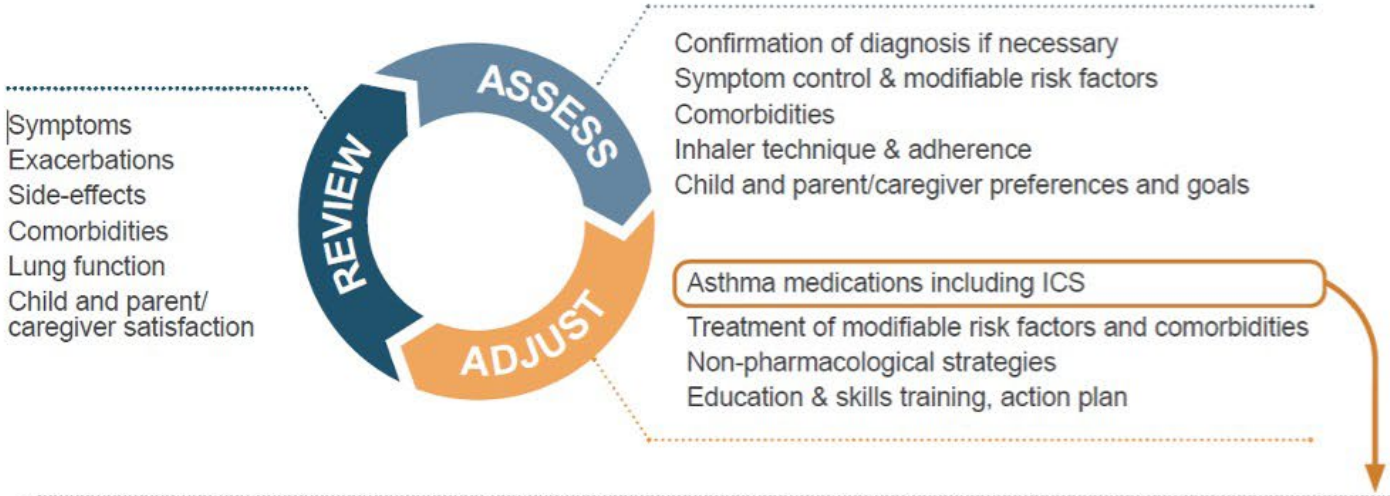
Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms	Low dose ICS taken whenever SABA taken*	Daily low dose inhaled corticosteroid (ICS) (see table of ICS dose ranges for children)	Low-dose ICS-LABA, OR medium-dose ICS, OR very low-dose ICS-formoterol maintenance and reliever (MART)*	Medium-dose ICS-LABA, OR low-dose ICS-formoterol MART* OR refer for expert advice	Refer for phenotypic assessment ± higher dose ICS-LABA or add-on therapy, e.g. LAMA, anti-IgE, anti-IL4Rα, anti-IL5
Other controller options (limited indications, or less evidence for efficacy or safety)		*Daily leukotriene receptor antagonist (LTRA†), or low dose ICS taken whenever SABA taken**	*Low dose ICS + LTRA†*	*Add tiotropium or add LTRA†*	*Only as last resort, consider add-on low dose OCS, but consider side-effects*
RELIEVER	As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)				

ICS: inhaled corticosteroid; Ig: immunoglobulin; IL: interleukin; LABA: long-acting beta$_2$-agonist; LTRA: leukotriene receptor antagonist (†advise about risk of neuropsychiatric adverse effects; MART: maintenance-and-reliever therapy with ICS-formoterol; OCS: oral corticosteroid; SABA: short-acting beta$_2$-agonist

GINA 2025 – STARTING TREATMENT

in children aged 6–11 years with a diagnosis of asthma



IF the patient has:		START WITH:	
Symptoms most days, waking at night once or more a week, and low lung function	YES	Medium dose ICS-LABA plus as-needed SABA, or low-dose MART OR refer for expert advice	**STEP 4**
NO			
Symptoms most days, or waking at night once or more a week	YES	Low-dose ICS-LABA or medium-dose ICS plus as-needed SABA; or very-low-dose MART	**STEP 3**
NO			
Symptoms 2–5 days a week	YES	Daily low-dose ICS plus as-needed SABA	**STEP 2**
NO			
Symptoms less than two days a week	YES	Take low dose ICS whenever SABA is taken	**STEP 1**

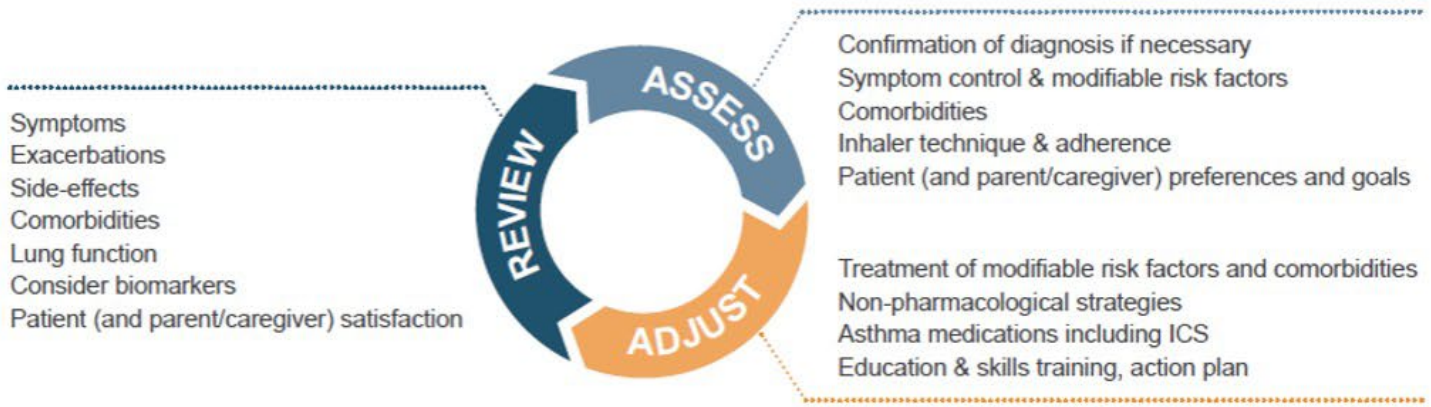
Short course of OCS may also be needed for children presenting with an exacerbation

For children with symptoms 1–2 days a week or less, adherence with daily ICS is likely to be very poor, so taking low-dose ICS whenever SABA is taken may be a better option for reducing exacerbation risk

ICS: inhaled corticosteroid; LABA: long-acting beta$_2$-agonist; MART: maintenance-and-reliever therapy with ICS-formoterol; OCS: oral corticosteroid; SABA: short-acting beta$_2$-agonist

GINA 2025
Adults & adolescents 12+ years

Personalized asthma management
Assess, Adjust, Review
for individual patient needs



TRACK 1: PREFERRED CONTROLLER and RELIEVER
Using ICS-formoterol as the reliever* reduces the risk of exacerbations compared with using a SABA reliever, and is a simpler regimen

STEPS 1 – 2
AIR-only*: low-dose ICS-formoterol as needed

STEP 3
MART* with low-dose maintenance ICS-formoterol

STEP 4
MART* with medium-dose maintenance ICS-formoterol

STEP 5
Add-on LAMA
Refer for assessment of phenotype. Consider trial of high-dose maintenance ICS-formoterol. Consider anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

RELIEVER: As-needed low-dose ICS-formoterol*

See GINA severe asthma guide

TRACK 2: Alternative **CONTROLLER and RELIEVER**
Before considering a regimen with SABA reliever, check if the patient is likely to adhere to daily controller treatment

STEP 1
Reliever only; if SABA, take ICS with each dose

STEP 2
Low dose maintenance ICS

STEP 3
Low dose maintenance ICS-LABA

STEP 4
Medium dose maintenance ICS-LABA

STEP 5
Add-on LAMA
Refer for assessment of phenotype. Consider trial of high-dose maintenance ICS-LABA. Consider anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

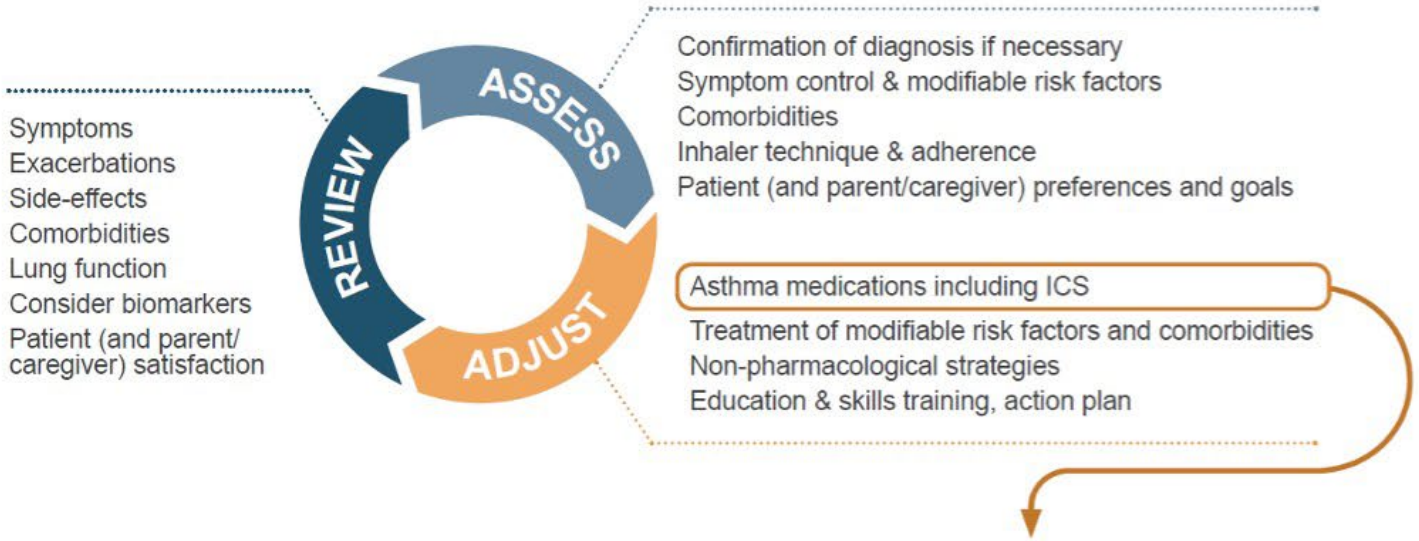
RELIEVER: as-needed ICS-SABA*, or as-needed SABA

Non-pharmacologic strategies include smoking cessation, physical activity, pulmonary rehabilitation, weight reduction, vaccinations (see text for more)
Allergen immunotherapy, e.g. HDM SLIT: consider for patients with clinically relevant sensitization and not well-controlled (but stable) asthma See text for further information and safety advice
Additional controller options (e.g., add-on LAMA at Step 4, add-on LTRA) have less evidence for efficacy or for safety than Tracks 1 or 2 (see text). Maintenance OCS should only ever be used as last resort.

AIR: anti-inflammatory reliever; HDM: house dust mite; ICS: inhaled corticosteroid; Ig: immunoglobulin; IL: interleukin; LABA: long-acting beta$_2$-agonist; LAMA: long-acting muscarinic antagonist; LTRA: leukotriene receptor antagonist; MART: maintenance-and-reliever therapy with ICS-formoterol; OCS: oral corticosteroid; SABA: short-acting beta$_2$-agonist; SLIT: subcutaneous immunotherapy; TSLP: thymic stromal lymphopoietin

GINA 2025 – STARTING TREATMENT

in adults and adolescents 12+ years with a diagnosis of asthma



IF the patient has:	START WITH:	TRACK 1 (preferred)	OR	TRACK 2	
Daily symptoms or waking at night once a week or more, and low lung function or recent exacerbation	YES	Medium dose ICS-formoterol maintenance and reliever (MART)		Medium dose ICS-LABA + as-needed SABA (or ICS-SABA)	STEP 4
Symptoms most days, or waking at night once a week or more, or low lung function	YES	Low dose ICS-formoterol maintenance and reliever (MART)		Low dose ICS-LABA + as-needed SABA (or ICS-SABA)	STEP 3
Symptoms less than 3–5 days a week, with normal (or mildly reduced) lung function	YES	As-needed-only low dose ICS-formoterol (AIR-only)		Low dose ICS + as-needed SABA (or ICS-SABA)	STEP 2
				As-needed ICS+SABA (separate inhalers or combination)	STEP 1

NO

NO

Short course of OCS may also be needed for patients presenting during an exacerbation

Track 2: in patients with symptoms 1–2 days a week or less, adherence with daily ICS would be very poor, so taking low-dose ICS whenever SABA is taken could reduce the risk of exacerbations

AIR: anti-inflammatory reliever; ICS: inhaled corticosteroid; LABA: long-acting beta$_2$-agonist; MART: maintenance-and-reliever therapy with ICS-formoterol; OCS: oral corticosteroid; SABA: short-acting beta$_2$-agonist

Assessment of asthma control

Asthma control has **two** components

A. Recent asthma symptom control

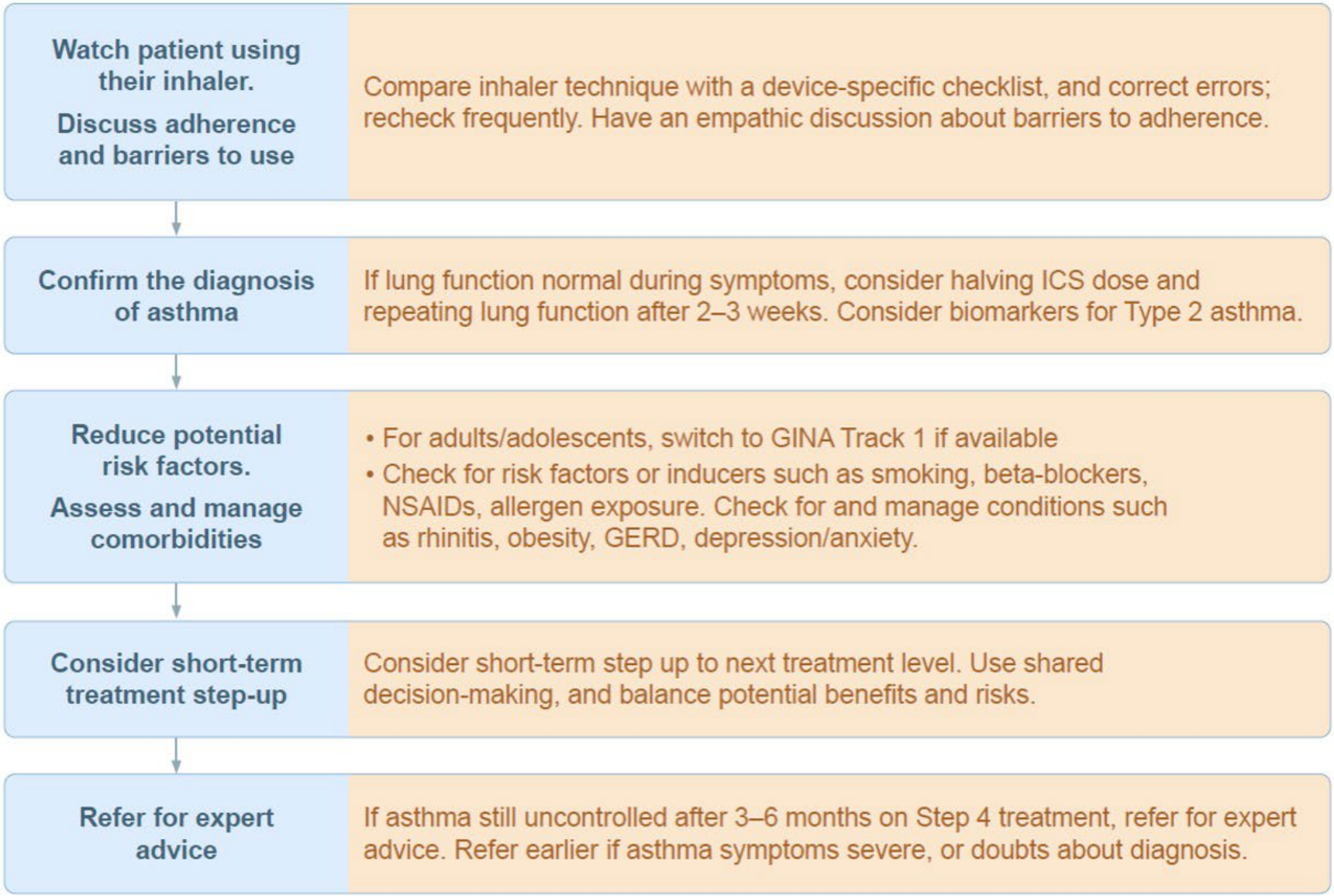
B. Risk factors for poor asthma outcomes

- Exacerbations
- Persistent airflow limitation
- Medication side-effects

Box 2-2. GINA assessment of asthma control at clinical visits in adults, adolescents and children 6–11 years

A. Recent asthma symptom control (but also ask the patient/caregiver about the whole period since last review*)				
In the past 4 weeks, has the patient had:		**Well controlled**	**Partly controlled**	**Uncontrolled**
• Daytime asthma symptoms more than twice/week?	Yes☐ No☐	None of these	1–2 of these	3–4 of these
• Any night waking due to asthma?	Yes☐ No☐			
• SABA† reliever for symptoms more than twice/week?	Yes☐ No☐			
• Any activity limitation due to asthma?	Yes☐ No☐			
B. Risk factors for poor asthma outcomes				
Assess risk factors at diagnosis and periodically, including after an exacerbation.				
Measure FEV_1 at start of treatment, after 3–6 months of ICS-containing treatment to record the patient's personal best lung function, then periodically for ongoing risk assessment.				
i. Risk factors for exacerbations				
Uncontrolled asthma symptoms: Having uncontrolled symptoms is an important risk factor for exacerbations.				
Factors that increase the risk of exacerbations even if the patient has few asthma symptoms:‡				
SABA over-use: High SABA use (≥3 x 200-dose canisters/year associated with increased risk of exacerbations, increased mortality particularly if ≥1 canister per month)				
Inadequate ICS: not prescribed ICS, poor adherence, or incorrect inhaler technique				
Other medical conditions: Obesity, chronic rhinosinusitis, GERD, confirmed food allergy, pregnancy				
Exposures: Smoking, e-cigarettes, allergen exposure if sensitized, air pollution				
Psychosocial: Major psychological or socioeconomic problems				
Lung function: Low FEV_1 (especially <60% predicted), high bronchodilator responsiveness				
Type 2 inflammatory markers: Raised blood eosinophils, high FeNO (see biomarker overview)				
Exacerbation history: Ever intubated or in intensive care unit for asthma, ≥1 severe exacerbation in last year				
ii. Risk factors for developing persistent airflow limitation				
History: Preterm birth, low birth weight and greater infant weight gain, frequent productive cough				
Medications: Lack of ICS treatment in patient with history of severe exacerbation				
Exposures: Tobacco smoke, noxious chemicals; occupational or domestic exposures				
Investigation findings: Low initial FEV_1, sputum or blood eosinophilia				
iii. Risk factors for medication side-effects				
Systemic Frequent OCS, long-term, high-dose and/or potent ICS, P450 inhibitors§				
Local: High-dose or potent ICS, poor inhaler technique				

Investigating uncontrolled asthma in primary care



GERD: gastro-esophageal reflux disease; ICS: inhaled corticosteroid; NSAID: non-steroidal anti-inflammatory drug; SABA: short-acting beta$_2$-agonist