هيئة الصحة بدبي
DUBAI HEALTH AUTHORITY

إجادة
EJADA

EJADA Program

ASTHMA

KPIs and Recommendations

2023

Asthma

KPIs and Recommendations

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Content

Introduction

Asthma is a chronic inflammatory disorder which is characterized by inflammation of the bronchial tubes with overproduction of mucus, leading to shortness of breath, wheezing, coughing., and chest pain or tightness. Asthma is often an early onset disease; however, some patients may develop it later in their life (late-onset). Early onset (allergic) asthma is usually associated with T helper 2 (Th2) cell responses, like other allergic conditions such as atopic dermatitis or allergic rhinitis, and is induced by environmental allergens such as HDM, pollen, etc. Late-onset asthma is usually the non-allergic form; and is classified into Th2 and non-Th2 late-onset asthma. The non-Th2 form is usually associated with obesity, aging, and smoking.

It is widely acknowledged that asthma is a diverse, multifactorial condition with several genetic and environmental components, and that tailored medicines can enhance asthma management. Treatment of asthma focuses on rescue and control therapies. As per disease-management guidelines, inhaled corticosteroids (ICS) are the main therapy for asthma control. In contrast, reliever or rescue therapies rapidly alleviate any acute symptoms that may develop. These include short-acting β2-adrenoceptor-agonists (SABAs), which significantly lessen airway bronchoconstriction by relaxing the smooth muscles of the airways. Based on the need to achieve asthma control, the degree of the control therapy was related to the severity of the disease, varying from low-dose ICS to combination low-dose ICS/long-acting beta-agonist (LABA), medium-dose ICS/LABA, up to high-dose ICS/LABA, as preferred control therapy, with a SABA as the rescue therapy. ICS is the standard therapy for severe and chronic asthma. However, if asthma is still uncontrolled, further long-term control therapies, such as LABA, montelukast, or theophylline, are administered.

Poor adherence to the recommended course of therapy appears to be the primary unmet need in the management of mild-to-moderate asthma. Numerous studies have found that the factors that are associated with emergency admissions for major asthma exacerbations in the adult population include poor adherence to prescribed medications, a lack of routine follow-up visits, unsatisfactory disease awareness, and consequently inadequate knowledge regarding how to manage an asthma attack. Fortunately, research in novel therapies that will be able to prevent and relieve asthma symptoms and improving quality of life of Asthma patients is ongoing.

Scope

The Ejada KPIs are quality indicators and ratings for physicians, facilities and insurance companies based on information collected by DHA systems from providers, payers and patients.

The Asthma KPIs and Recommendations are based on UAE and International guidelines. The KPIs are designed for healthcare practitioners and providers to follow international best practices in the management of Asthma patients.

The Asthma KPIs cover the following aspects of Asthma management:

- Assessment of Pulmonary Function using spirometry and peak flow measurements
- Pharmacological management of Asthma (controller and reliever medications)
- Use of biologics in management of Asthma
- Hospitalization and referrals of Asthma patients

The KPIs and recommendations have been reviewed by leading Asthma expert in the country.

List of Abbreviations

S.No.	Abbreviation	Full form
2	AMR	Asthma Medication Ratio
3	BUD-FORM	Budesonide/formoterol
4	ED	Emergency department
5	KPI	Key Performance Indicators
6	HDM SLIT	House Dust Mite SubLingual ImmunoTherapy
7	ICS	Inhaled corticosteroids
8	Ig	Immunoglobulin
9	IL	Interleukin
10	LABA	Long-acting β2-agonists
11	LTRA	Leukotriene receptor antagonists
12	MART	Maintenance and reliever therapy
13	MDC	Macrophage-derived chemokine
14	OCS	Oral corticosteroids
15	PEF	Peak expiratory flow
16	PEFR	Peak Expiratory Flow Rate
17	SABA	Short-acting β2-agonists
18	TSLP	Thymic stromal lymphopoietin

KPIs and their Measuring Parameters

Reporting Frequency: Monthly

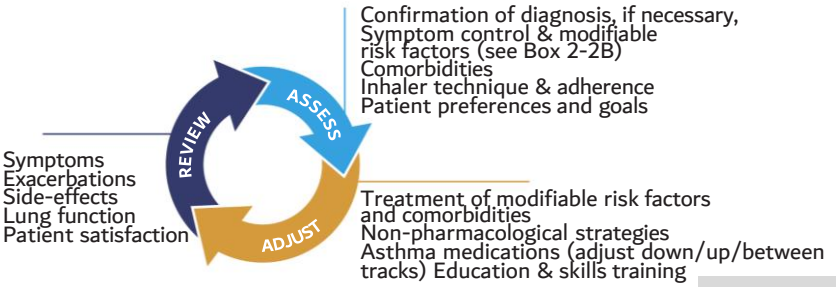
S.No.	KPIs	Measuring Parameters
1	Assessment of Pulmonary Function using spirometry in asthma Patients	Spirometry Measurements
2	Monitoring of Pulmonary Function in Asthma	Peak flow meter Measurements
3	Asthma Medication Ratio	Dispensed Prescriptions
4	Controller Medication (adults and adolescents)– As-needed ICS	Dispensed Prescriptions
5	Controller Medication (adults and adolescents)–ICS-formoterol MART	Dispensed Prescriptions
6	Controller Medication (adults and adolescents)–ICS-formoterol MART	Dispensed Prescriptions
7	Controller Medication (6-11yrs) – ICS	Dispensed Prescriptions
8	Controller Medication (6-11yrs) – ICS with SABA	Dispensed Prescriptions
9	Controller Medication (6-11 yrs) – ICS-LABA	Dispensed Prescriptions
10	Controller Medication (6-11 yrs) –ICS with SABA	Dispensed Prescriptions
11	Controller Medication (6-11 yrs) – ICS-formoterol MART	Dispensed Prescriptions
12	Controller Medication (6-11 yrs) – ICS-LABA	Dispensed Prescriptions
13	Controller Medication (6-11 yrs) – ICS-formoterol MART	Dispensed Prescriptions
14	Reliever Medication (adult and adolescents) – ICS-Formoterol	Dispensed Prescriptions
15	Reliever Medication (adult and adolescents) – ICS-Formoterol	Dispensed Prescriptions
16	Reliever Medication (6-11 yrs) – SABA	Dispensed Prescriptions
17	Prescription of Add-on Biologics for Severe Asthma	Dispensed Prescriptions
18	Avoidable Hospital Admission Indicators for Asthma (OECD)	Hospital Admission
19	Cost due to Emergency Department Visit	Costs of ED visit

Asthma Management and Prevention

Adults & adolescents 12+ years

Personalized asthma management

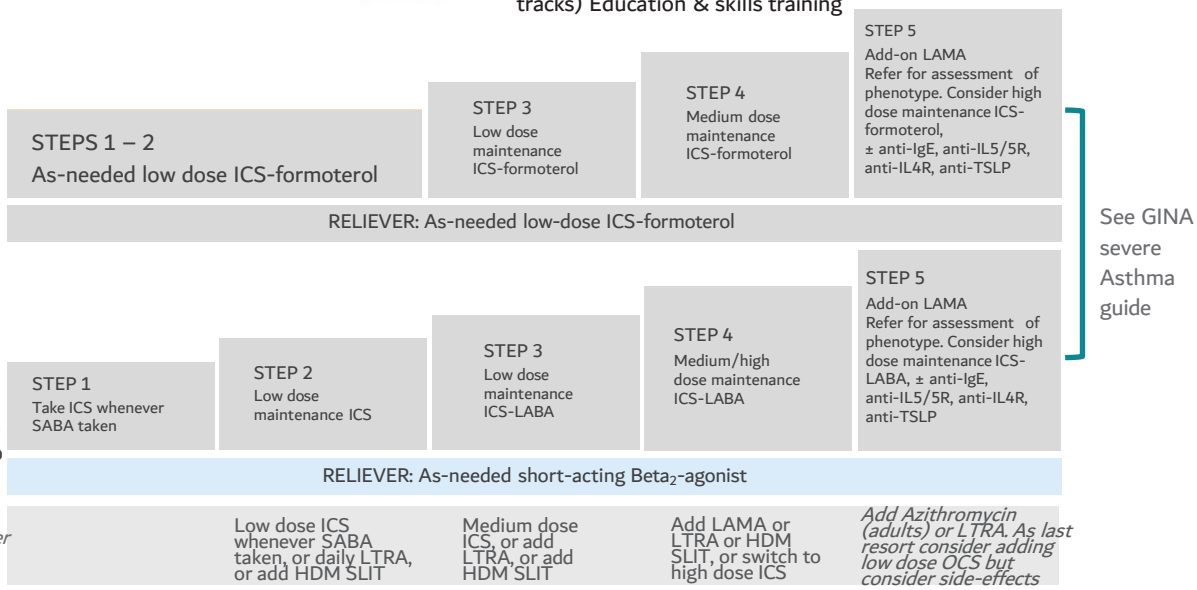
Assess, Adjust, Review
for individual patient needs



Controller and Preferred reliever
(Track 1). Using ICS-formoterol as reliever reduces the risk of exacerbations compared with using a SABA reliever

Controller and Alternate reliever
(Track 2). Before considering a regimen with SABA reliever, check if the patient is likely to be adherent with daily controller

Other controller options for either track (limited indications, or less evidence for efficacy or safety)



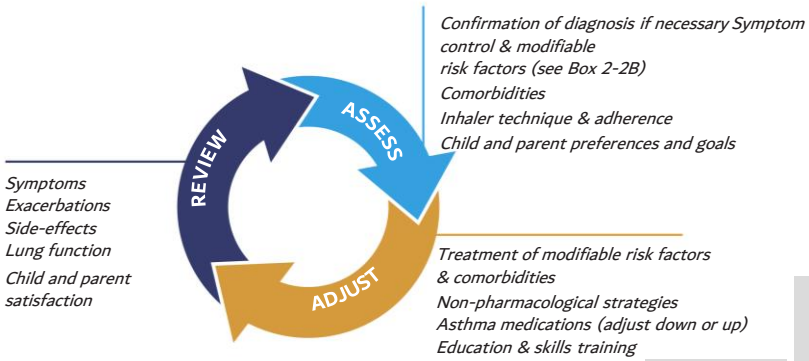
Adapted from Global Initiative for Asthma, www.ginasthma.org

Asthma Management and Prevention

Children 6-11 years

Personalized asthma management

Assess, Adjust, Review
for individual patient needs



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 maintenance and reliever therapy (MART). Refer for expert advice	Refer for phenotypic assessment ± higher dose ICS-LABA or add-on therapy, e.g. anti-IgE, anti-IL4R
Other controller options (limited indications, or less evidence for efficacy or safety)	*Consider daily low dose ICS*	*Daily leukotriene receptor antagonist (LTRA), or low dose ICS taken whenever SABA taken*	*Low dose ICS + LTRA*	*Add tiotropium or add LTRA*	*Add-on anti-IL5 or, as last resort, consider add-on low dose OCS, but consider side-effects*
Reliever	As-needed short-acting beta$_2$-agonist (or ICS-formoterol reliever in MART in Steps 3 and 4)				

**Very low dose: BUD-FORM 100/6 mcg*
†Low dose: BUD-FORM 200/6 mcg (metered doses).

Adapted from Global Initiative for Asthma, www.ginasthma.org

Health Outcomes Indicators

Assessment of Pulmonary Function in Poorly controlled Asthma Patients

Description Title	Assessment of pulmonary function in patients with poorly controlled asthma
Definition	Percentage of patients aged 6-64 years with poorly controlled asthma who had an assessment of their pulmonary function using spirometry at least two times a year during the measurement year
Numerator	Number of patients aged 6-64 years with poorly controlled asthma who had an assessment of their pulmonary function using spirometry at least two times a year during the measurement year
Denominator	Total number of patients with poorly controlled asthma during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions for which spirometry is indicated
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher is better
Rationale	Asthma is characterized by variable expiratory airflow limitation, i.e., expiratory lung function varies over time and in magnitude, to a greater extent than in healthy populations. Poorly controlled asthma is associated with greater variability in lung-function than well-controlled asthma. Pulmonary function monitoring should be carried out by well-trained operators with well-maintained and regularly calibrated equipment, with an inline filter to protect against transmission of infection.

Monitoring of Pulmonary Function in Asthma using peak flow meter

Description Title	Monitoring of pulmonary function in patients with asthma
Definition	Percentage of asthma patients aged 6-64 years who monitored diurnal Peak Expiratory Flow Rate (PEFR) variability using peak flow meter during the measurement year
Numerator	Number of asthma patients aged 6-64 years who monitored diurnal Peak Expiratory Flow Rate (PEFR) variability using peak flow meter in last 12 months
Denominator	Number of asthma patients aged 6-64 years during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions for which spirometry is indicated
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher is better
Rationale	If PEF is used, the same meter should be used each time, as measurements may differ from meter to meter by up to 20%. In clinical practice, once an obstructive defect has been confirmed, variation in airflow limitation is generally assessed from variation in PEF. Reversibility is measured using PEF within minutes after inhalation of a rapid-acting bronchodilator or more sustained improvement over days or weeks after introduction of effective controller treatment such as ICS.

Asthma Medication Ratio

Description Title	Asthma medication ratio of controller medications to total asthma medications
Definition	Percentage of patients 6–64 years of age identified as having persistent asthma and a ratio of controller medications to total asthma medications of ≥ 0.50 during the measurement year.
Numerator	Number of patients 6–64 years of age having persistent asthma and a ratio of controller medications to total asthma medications of ≥ 0.50 during the measurement year.
Denominator	Total number of patients 6-64 years of age identified as having persistent asthma (persistent asthma ED visits, acute inpatient encounters, outpatient visits for asthma, at least 4 asthma medication dispensing events) during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher is better
Rationale	Adherence for the AMR measure is determined by the member remaining on their prescribed asthma medications and maintaining a controller ratio of at least 0.50 during the measurement year. This is determined by pharmacy claims data (the plan will capture data each time the member fills their prescription)

Controller Medication – ICS

Description Title	Prescription of as-needed low-dose ICS in adults and adolescents with asthma
Definition	Percentage of adults and adolescents with symptoms less than twice a month, need for reliever twice a month or more, no risk factors for exacerbations or no exacerbations, prescribed with ICS during the measurement year
Numerator	Number of adults and adolescents with symptoms less than twice a month, need for reliever twice a month or more, no risk factors for exacerbations or no exacerbations, prescribed with ICS during the measurement year
Denominator	Number of adults and adolescents with symptoms less than twice a month, need for reliever twice a month or more, no risk factors for exacerbations or no exacerbations during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	Early initiation of low-dose ICS in patients with asthma leads to greater improvement in lung function.

Controller Medication – low-dose ICS-formoterol MART

Description Title	Prescription of low-dose ICS-formoterol MART in adults and adolescents with asthma
Definition	Percentage of adults and adolescents having symptoms most days (4-5 days/week), prescribed with ICS-formoterol MART during the measurement year
Numerator	Number of adults and adolescents having symptoms most days (4-5 days/week), prescribed with ICS-formoterol MART during the measurement year
Denominator	Number of adults and adolescents having symptoms most days (4-5 days/week) during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	For adults and adolescents, the preferred Step 3 treatment is low dose ICS-formoterol as MART. This reduces the risk of severe exacerbations compared with maintenance ICS-LABA controller plus as-needed SABA

Controller Medication – Medium-dose ICS-formoterol MART

Description Title	Prescription of medium-dose ICS-formoterol MART in adults and adolescents with asthma
Definition	Percentage of adults and adolescents with severe acute exacerbation, prescribed with medium-dose ICS-formoterol MART during the measurement year
Numerator	Number of adults and adolescents with severe acute exacerbation, prescribed with medium-dose ICS-formoterol MART during the measurement year
Denominator	Number of adults and adolescents with severe acute exacerbation during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	For adults and adolescents, the preferred Step 3 treatment is low dose ICS-formoterol as MART. This reduces the risk of severe exacerbations compared with maintenance ICS-LABA controller plus as-needed SABA. If needed, the maintenance dose of ICS-formoterol can be increased to medium for better symptom control

Controller Medication – Low-dose ICS

Description Title	Prescription of low-dose ICS in children (6-11 years) with asthma
Definition	Percentage of children (6-11 years) with symptoms twice a month or more, but less than daily, prescribed with low-dose ICS in the measurement year
Numerator	Number of children (6-11 years) with symptoms twice a month or more, but less than daily, prescribed with low-dose ICS in the measurement year
Denominator	Number of children (6-11 years) with symptoms twice a month or more, but less than daily in the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children with symptoms twice a month or more, but less than daily, initial controller treatment with low-dose ICS prevents exacerbations and to control symptoms

Controller Medication – ICS with SABA

Description Title	Prescription of ICS with as-needed SABA in children (6-11 years) with asthma
Definition	Percentage of children (6-11 years) with symptoms less than twice a month, or no exacerbations, prescribed ICS with SABA during the measurement year
Numerator	Number of children (6-11 years) with symptoms less than twice a month, or no exacerbations, prescribed ICS with SABA during the measurement year
Denominator	Number of children (6-11 years) with symptoms less than twice a month, or no exacerbations during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children diagnosed with asthma with symptoms less than twice a month, or no risk factors for exacerbations, treatment with ICS and as-needed SABA, prevent exacerbations and to control symptoms

Controller Medication – Low-dose ICS-LABA

Description Title	Prescription of ICS-LABA in children (6-11 years) with asthma
Definition	Percentage of children (6-11 years) with having symptoms most days (4-5 days/week), or waking with asthma once a week or more, prescribed with low-dose ICS-LABA during the measurement year
Numerator	Number of children (6-11 years) with having symptoms most days (4-5 days/week), or waking with asthma once a week or more, prescribed with low-dose ICS-LABA during the measurement year
Denominator	Number of children (6-11 years) with having symptoms most days (4-5 days/week), or waking with asthma once a week or more during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children diagnosed with asthma and with symptoms most days, or waking with asthma once a week or more, treatment with low-dose ICS-LABA prevents exacerbations and controls symptoms

Controller Medication – Medium-dose ICS with SABA

Description Title	Prescription of medium-dose ICS with as-needed SABA in children (6-11 years) with asthma
Definition	Percentage of children (6-11 years) with having symptoms most days (4-5 days/week), prescribed with medium-dose ICS with SABA during the measurement year
Numerator	Number of children (6-11 years) with having symptoms most days (4-5 days/week), prescribed with medium-dose ICS with SABA during the measurement year
Denominator	Total number of children (6-11 years) with having symptoms most days (4-5 days/week) during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children diagnosed with asthma, with symptoms most days, or waking with asthma once a week or more, and low lung function, treatment with medium-dose ICS with as-needed SABA, prevents exacerbations and controls symptoms

Controller Medication – Low-dose ICS-formoterol MART

Description Title	Prescription of very low-dose ICS-formoterol MART in Children (6-11 years) with asthma
Definition	Percentage of children (6-11 years) with having symptoms most days (4-5 days/week), prescribed with very low-dose ICS-formoterol MART during the measurement year
Numerator	Number of children (6-11 years) with having symptoms most days (4-5 days/week), prescribed with very low-dose ICS-formoterol MART during the measurement year
Denominator	Number of children (6-11 years) with having symptoms most days (4-5 days/week) during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children diagnosed with asthma, with symptoms most days, or waking with asthma once a week or more, and low lung function, treatment with low-dose ICS-formoterol MART, prevents exacerbations and controls symptoms

Controller Medication – Medium-dose ICS-LABA

Description Title	Prescription of medium-dose ICS-LABA in children (6-11 years) with asthma
Definition	Percentage of children (6-11 years) with severely uncontrolled asthma or with an acute exacerbation, prescribed with medium-dose ICS-LABA
Numerator	Number of children (6-11 years) with severely uncontrolled asthma or with an acute exacerbation, prescribed with medium-dose ICS-LABA
Denominator	Number of children (6-11 years) with severely uncontrolled asthma or with an acute exacerbation
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children diagnosed with asthma, with severely uncontrolled asthma or with an acute exacerbation, treatment with medium-dose ICS-LABA reduces exacerbation and controls the symptoms

Controller Medication – Low-dose ICS-formoterol MART

Description Title	Prescription of low-dose ICS-formoterol in patients with asthma (Children 6-11 years)
Definition	Percentage of children (6-11 years) with severely uncontrolled asthma or with an acute exacerbation prescribed with low-dose ICS-formoterol MART during the measurement year
Numerator	Number of children (6-11 years) with severely uncontrolled asthma or with an acute exacerbation, prescribed with low-dose ICS-formoterol MART during the measurement year
Denominator	Total number of patients in age group 6-11 years diagnosed with severely uncontrolled asthma or with an acute exacerbation during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children diagnosed with asthma, with severely uncontrolled asthma or with an acute exacerbation, treatment with ICS-formoterol MART, reduces the exacerbation and controls the symptoms

Reliever Medication –Low-dose ICS-Formoterol

Description Title	Prescription of low-dose ICS-formoterol in adults and adolescents with asthma
Definition	Percentage of adults and adolescents having symptoms most days (4-5 days/week) with worsening asthma and/or exacerbations, prescribed with low-dose ICS-formoterol as reliever during the measurement year
Numerator	Number of adults and adolescents having symptoms most days (4-5 days/week) with worsening asthma and/or exacerbations, prescribed with low-dose ICS-formoterol as reliever during the measurement year
Denominator	Number of adults and adolescents having symptoms most days (4-5 days/week) with worsening asthma and/or exacerbations
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In adults and adolescents having symptoms most days (4-5 days/week), or waking with asthma once a week or more, treatment with low-dose ICS-formoterol relieves the breakthrough symptoms, including during worsening asthma or exacerbations. They are also recommended for short-term prevention of exercise-induced bronchoconstriction.

Reliever Medication – Medium-dose ICS-Formoterol

Description Title	Prescription of medium-dose ICS formoterol in adults and adolescents with acute exacerbation
Definition	Percentage of adults and adolescents having symptoms most days (4-5 days/week) with worsening asthma and/or exacerbations, prescribed with medium-dose ICS-formoterol as reliever during the measurement year
Numerator	Number of adults and adolescents having symptoms most days (4-5 days/week) with worsening asthma and/or exacerbations, prescribed with medium-dose ICS-formoterol as reliever during the measurement year
Denominator	Number of adults and adolescents having symptoms most days (4-5 days/week) with worsening asthma and/or exacerbations
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring ICS/Bronchodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	Reliever is provided to all patients for as-needed relief of breakthrough symptoms, including during worsening asthma or exacerbations. They are also recommended for short-term prevention of exercise-induced bronchoconstriction.

Reliever Medication – Use of SABA

Description Title	Prescription of As-needed SABA in children (6-11 years)with asthma
Definition	Percentage of children (6-11 years) with symptoms less than twice a month or symptoms twice a month or more, but less than daily or symptoms most days (4-5 days/week) or acute exacerbation, complying with SABA as reliever during the measurement year
Numerator	Number of children (6-11 years) with symptoms less than twice a month or symptoms twice a month or more, but less than daily or symptoms most days (4-5 days/week) or acute exacerbation, complying with SABA as reliever during the measurement year
Denominator	Number of children (6-11 years) with symptoms less than twice a month or symptoms twice a month or more, but less than daily or symptoms most days (4-5 days/week) or acute exacerbation during the measurement year
Exclusion criteria	Patients diagnosed with other respiratory conditions requiring broncodilators
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher percentage is better
Rationale	In children with asthma with aforementioned symptoms, as-needed SABA provides relief from breakthrough symptoms, including during worsening asthma or exacerbations. They are also recommended for short-term prevention of exercise-induced bronchoconstriction.

Prescription of Add-on Biologics for Severe Asthma

Description Title	Prescription of add-on biologics for patients with severe asthma
Definition	Percentage of patients with phenotypic severe asthma (TSLP)/severe allergic asthma (IgE)/severe eosinophilic asthma (IL5/IL5R)/severe eosinophilic-Type 2 asthma (IL4R) prescribed with biologics during the measurement year
Numerator	Number of patients with phenotypic severe asthma (TSLP)/severe allergic asthma (IgE)/severe eosinophilic asthma (IL5/IL5R)/severe eosinophilic-Type 2 asthma (IL4R) prescribed with biologics during the measurement year
Denominator	Number of patients with phenotypic severe asthma (TSLP)/severe allergic asthma (IgE)/severe eosinophilic asthma (IL5/IL5R)/severe eosinophilic-Type 2 asthma (IL4R) during the measurement year
Exclusion criteria	Patients receiving biologics for other approved indications
Unit of measure	Percentage (Numerator/Denominator x 100)
Measure target and/or threshold	Higher number of days or higher percentage is better
Rationale	Omalizumab binds to Fc part of free IgE, preventing binding of IgE to FcεR1 receptors, reducing free IgE and down-regulating receptor expression. Mepolizumab and Reslizumab bind circulating IL-5; Benralizumab binds to IL-5 receptor α subunit leading to apoptosis of eosinophils. Dupilumab binds to IL-4 receptor alpha, blocking both IL-4 and IL-13 signaling. Tezepelumab binds circulating TSLP, a bronchial epithelial cell-derived alarmin implicated in multiple downstream processes involved in asthma pathophysiology.

Avoidable Hospital Admission Indicator

Description Title	Avoidable Hospital Admission Indicator for Asthma
Definition	Percentage of non-maternal/non-neonatal hospital admissions with a principal diagnosis of asthma during the measurement year
Numerator	Number of non-maternal/non-neonatal hospital admissions with a principal diagnosis of asthma during the measurement year
Denominator	Total number of asthma patients during the measurement year
Exclusion criteria	• Cases where the patient died in hospital during the admission • Cases resulting from a transfer from another acute care institution (transfers-in) • Cases with MDC 14 or specified pregnancy, childbirth, and puerperium codes in any field • Cases with MDC 15 or specified Newborn and other neonate codes in any field • Cases with cystic fibrosis and anomalies of the respiratory system diagnosis code in any field • Cases that are same day/day only admissions
Unit of measure	Percentage [(Numerator/Denominator)*100]

Cost due to Emergency Department Visit

Description Title	Cost incurred (in AED) due to emergency department visit in patients with asthma
Definition	Average cost incurred (in AED) due to emergency department visit in patients with asthma with severe exacerbations during the measurement year
Numerator	Total cost incurred due to emergency department visits in patients with asthma with severe exacerbations who visited the ED during the measurement year
Denominator	Total number of asthma patients who visited emergency department for asthma with severe exacerbations in the measurement year
Exclusion criteria	Patients with asthma without acute exacerbation episodes who visited ED
Unit of measure	Average (Numerator/Denominator)
Measure target and/or threshold	Lower is better
Rationale	Severe exacerbations of asthma are life-threatening medical emergencies, which are most safely managed in an acute care setting, such as emergency department. Appropriate management is crucial is reduce the emergency department visits and associated healthcare costs

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