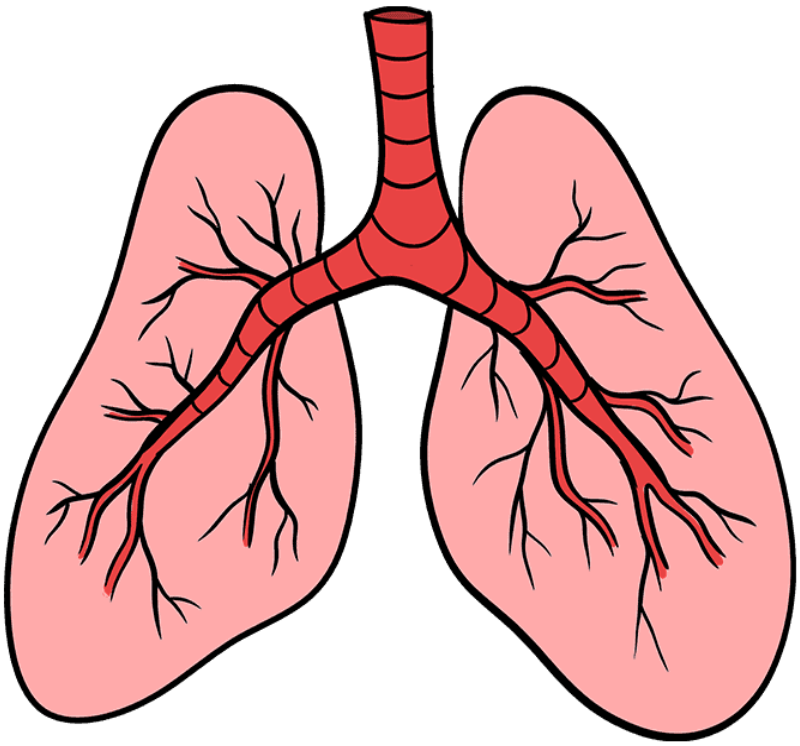

Guideline for Management of Childhood Asthma

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Contents

Introduction

Asthma is a chronic inflammatory condition of the lung airways resulting in episodic airflow obstruction. It is a leading cause of emergency department visits and hospital admissions for children. Common triggers for asthma are exercise, allergen or irritant exposure, change in weather, exercise, or viral respiratory infections. In Maldives, asthma is very common in children. Asthma is a chronic disease and carries a significant morbidity. Many children present with exacerbation. So, it is important to have guideline and manage asthma systematically to decrease the burden and impact of the disease.

It is characterized by bronchial hyper-responsiveness and variable airflow obstruction, that is often reversible.

This guideline is intended for the evaluation and management of the asthma and asthma exacerbation in children under 16 years of age in Maldives.

Case definition:

Asthma: It is defined as chronic respiratory condition characterised by history of respiratory symptoms such as cough, wheeze, shortness of breath and chest tightness that vary over time and in intensity, together with variable expiratory airflow limitation.

Asthma exacerbation: A flare-up or exacerbation is an acute or sub-acute worsening in symptoms and/or lung function from the patient's usual status.

This guideline is divided into 2 sections:

1. Asthma in children: > 5 years
2. Asthma in children: ≤ 5 years

Asthma in children: > 5 years

Criteria for Diagnosing Asthma:

Asthma has two important features:

- A history of respiratory symptoms such as cough, wheeze, shortness of breath, chest tightness that changes over time and in intensity and
- variable expiratory airflow limitation.

Box 1

FEATURES	CRITERIA SUPPORTING ASTHMA DIAGNOSIS
1. History of variable respiratory symptoms	
Cough, Wheeze, shortness of breath, chest tightness	• Usually more than one type of respiratory symptom • Symptoms varies over time and in intensity. • Symptoms are often worse at night or on waking • Symptoms are often triggered by exercise, laughter, allergens, cold air, viral infections.
2. Confirmed variable expiratory airflow limitation • **documented airflow limitation** • **Variation in lung function**	• Low FEV1/FVC (normally >0.90). • Positive bronchodilator reversibility test: increase in FEV1 of >12% predicted. • Average daily diurnal PEF variability >13%. • FEV1 increases >12% of the predicted value after 4 weeks of anti- inflammatory treatment.

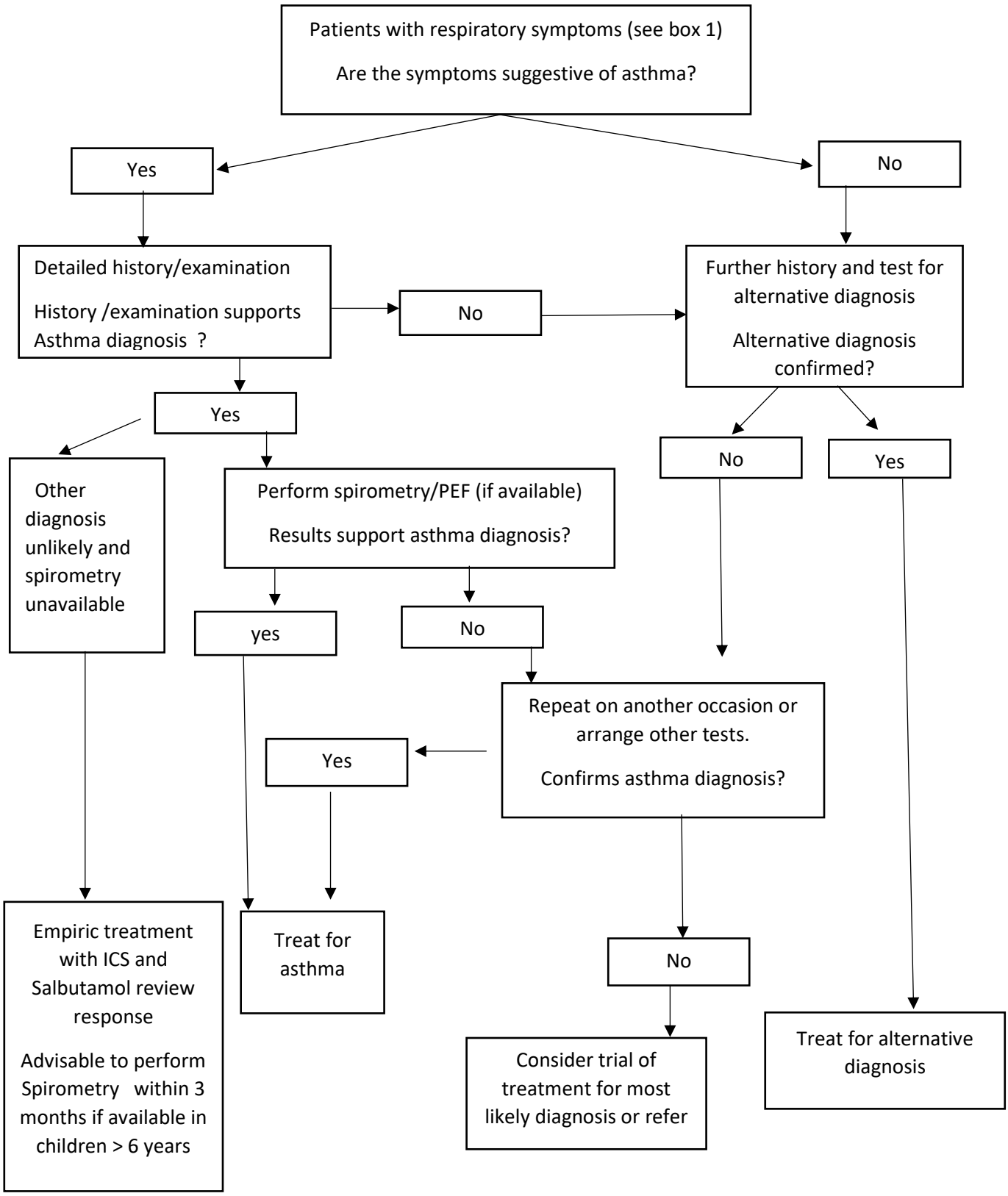
Intermittent dry coughing and expiratory wheezing are the most common chronic symptoms of asthma. The presence of risk factors such as a history of other allergic conditions (allergic rhinitis, allergic conjunctivitis, atopic dermatitis, food allergies), parental asthma, supports the diagnosis of asthma. Physical examination in children with asthma is often normal.

Lung function testing (spirometry)

Asthma is characterized by variable expiratory airflow limitation, i.e. expiratory lung function varies over time. FEV1/FVC ratio is usually > 0.90 in children.

- Reduced ratio of FEV1 to FVC indicates airflow limitation.
- Once asthma has been diagnosed, lung function is most useful as an indicator of future risk.
- It is advisable to do Lung function test in child over 6 years if available and if child can perform the test.

Algorithm 1: Asthma evaluation and treatment.



Assessment of asthma:

Moniter asthma at every review

1. Assess asthma control
2. Assess treatment issues
3. Assess comorbidities
4. Assess risk of future asthma attacks

1. Assessment of asthma control in children > 5 years:

- Ask about symptom over the last 4 weeks

Box 2.

Asthma symptom control		**Category**		
In the past 4 weeks, has the patient had:		**Well controlled**	**Partly controlled**	**Uncontrolled**
Daytime symptoms > twice/week	Yes/No	None of these	1–2 of these	3–4 of these
Any night waking due to asthma?	Yes/No			
Salbutamol needed > twice/week?	Yes/No			
Any activity limitation due to asthma?	Yes/No			

2. Assess treatment issues:

- Check the patient's current treatment step.
- Assess side-effects, check child's height at least yearly.
- Watch inhaler technique.
- assess adherence.
- Check if patient has a written asthma action plan.

3. Assess comorbidities

- Rhinosinusitis,
- Gastroesophageal reflux,
- Obesity,
- Obstructive sleep apnea,
- Depression, anxiety

These can contribute to symptoms, poor quality of life and poor asthma control

4. Assess risk of future asthma attacks

Assess risk of future asthma attacks at every asthma review by asking about history of previous attacks, objectively assessing current asthma control, and reviewing reliever use.

Asthma Severity

Asthma severity is assessed retrospectively from the level of treatment required to control symptoms and exacerbations. Asthma severity is not a static feature and may change over months or years. Asthma severity can be assessed when the patient has been on regular controller treatment for several month. (See page 11and page 23)

Mild asthma: that can be controlled with Step 1 or 2 treatment.

Moderate asthma: that is well controlled with Step 3 or step 4 treatment

Severe asthma: that requires high dose ICS + LABA or is uncontrolled despite high dose ICS + LABA.

ASTHMA MANAGEMENT

The long-term goals of asthma management are to achieve good symptom control, to minimize future risk of exacerbations and medications' adverse effects.

Effective asthma management requires a co-operation between the person with asthma (or the parent/carer) and their health care providers.

Asthma treatment consist cycle of assessment, adjusting the treatment and reviewing the response.

Choosing Treatment Step for asthma: based on Presentation (children > 5 years)

Box 3.

Step	Presentation
STEP 1	• occasional daytime symptoms (e.g., < twice a month), • no night waking due to asthma, • no exacerbations in the last year, • normal FEV1
STEP 2	• Asthma symptoms > twice a month • Waking due to asthma > once a month • Any asthma symptoms plus any risk factors for exacerbations (low FEV1, previous intensive care unit care for asthma)
STEP 3	• Troublesome asthma symptoms most days. • waking due to asthma once a week or more.
STEP 4	• Initial asthma presentation is with severely uncontrolled asthma

Box 4 Stepwise Treatment of Asthma: (children > 5 years)

	Step 1	Step 2	Step 3	Step 4	Step 5
Preferred	As needed Salbutamol	Low dose ICS	- Low dose ICS + LABA Or Medium dose ICS	Medium dose ICS + LABA	Refer to Specialist
Other options	Consider low dose ICS	Montelukast	- Low dose ICS + montelukast	Medium dose ICS+ montelukast	
As needed Salbutamol					

ICS: inhaled corticosteroids

LABA: Long Acting Beta2 Agonist: Salmeterol, Formoterol

Stepwise approach for adjusting asthma treatment

Once asthma treatment has been started, ongoing treatment decisions are based on a cycle of assessment, adjustment of treatment, and review of the response.

Controller medication is adjusted up or down in a stepwise approach to achieve good symptom control and minimize future risk of exacerbations, fixed airflow limitation and medication side-effects.

Follow up every 2-6 wk until good asthma control is achieved, then 3- 6 monthly.

If a patient has persisting symptoms and/or exacerbations despite 2–3 months of controller treatment, assess and correct the following common problems before considering any step up in treatment:

- Incorrect inhaler technique
- Poor adherence.

- Persistent exposure to agents such as allergens, tobacco smoke, air pollution, or to medications such as beta-blockers, NSAIDs.
- Comorbidities
- In correct diagnosis.

if a child asthma is not well-controlled, therapy level should be increased by one step and close monitoring is recommended.

- Moniter growth (height and weight) of children with asthma on an annual basis.

Stepping down Medications:

- Consider stepping down treatment once good asthma control has been achieved and maintained for 3 months, to find the lowest treatment that controls both symptoms and exacerbations, and minimizes side-effects.
- Step down by reducing the ICS dose by 25–50% at 3-month intervals.
- Once stepping down to step 2 and if asthma is well controlled with step 2 treatment, then change ICS to Once-daily dosing.
- ***Consider stopping controller treatment only if there have been no symptoms for 6–12 months.***
- Follow up at least for 12 months after stopping controller medication.

ADVICE

- Strongly encourage people with asthma to avoid environmental smoke exposure.
- Advice to engage in regular physical activity.
- Weight loss interventions (including healthy diets and exercise) should be considered for overweight and obese children with asthma.
- Avoid NSAIDs including aspirin: always ask about asthma before prescribing
- Give influenza vaccination every year.

EXERCISE INDUCED ASTHMA

For most children, exercise-induced asthma is an expression of poorly-controlled asthma and regular treatment including inhaled corticosteroids should be reviewed. An inhaled salbutamol can can be used before exercise or physical activities to relieve symptoms that develop after exercise as-needed.

ASTHMA FLARE-UPS (EXACERBATIONS)

A flare-up or exacerbation is an acute or sub-acute episode of worsening in symptoms and lung function from the patient's usual status. It occasionally may be the initial presentation of asthma.

Self-Management of Asthma Exacerbations at Home.

All patients should be provided with a written asthma action plan to guide recognition and management of exacerbations.

- Give Immediate treatment with inhaled salbutamol (100mcg/puff) 2–10 puffs, repeat every 20 minutes up to 3 treatments in 1 hr if needed.
  - A good response is characterized by resolution of symptoms within 1 hr, no further symptoms over the next 4 hr.
  - adjust salbutamol frequency as needed May continue inhaled salbutamol as needed for 24–48 hours.
- Contact doctor for follow-up, especially if bronchodilators are required repeatedly over the next 24-48 hr.
- If the child has an incomplete response to initial treatment with salbutamol (persistent symptoms, a short course of oral prednisone 1-2 mg/kg/day [not to exceed 40 mg/day] for 3-5 days in addition to inhaled salbutamol should be started after contacting doctor.
- Immediate medical attention should be sought for severe exacerbations, persistent signs of respiratory distress, lack of expected response or sustained improvement after initial treatment, further deterioration, or previous history of severe exacerbation.

CLASSIFYING SEVERITY OF ASTHMA EXACERBATIONS IN CHILDREN

Box 5.

Severity	Symptoms and Signs
Mild/ Moderate	• Able to talk in sentences or feeding. • SpO2 ≥92% • Heart rate ▪ ≤140/min in children aged 1–5 years ▪ ≤125/min in children >5 years • Respiratory rate ▪ ≤40/min in children aged 1–5 years ▪ ≤30/min in children >5 years • PEF ≥50%
Severe	• Can't complete sentences in one breath or too breathless to talk or feed • SpO2 <92% • Heart rate ▪ >140/min aged 1–5 years ▪ >125/min in children >5 years • Respiratory rate ▪ >40/min 1–5 years ▪ >30/min in children >5 years • PEF 33–50%
Life threatening	• Any one of the following in a child with severe asthma: Too dyspneic to speak, Exhaustion, Cyanosis, Silent chest, Poor respiratory effort or Confusion • SpO2 <92% • PEF < 33%

MANAGEMENT OF ASTHMA EXACERBATION IN HOSPITAL.

- Follow algorithm 2 (page 19)
- Assess exacerbation severity
  - Focused history
  - Clinical assessment: vital signs of respiratory distress, air entry, alteration in mental status.
- Maintain airway, breathing, circulation as necessary.

TREATMENT: Stepwise

1. **Oxygen**: via mask or nasal cannula
   - Moniter pulse oximetry, maintain Spo2 >94%
2. **Inhaled Salbutamol**: (concentration: 5 mg/mL)
   - Age < 5 year: 2.5 mg
   - Age < 5 – 12 years: 2.5 mg- 5 mg
   - Age > 12 year: 5 mg

   Mix with Normal Saline to make 3 ml total volume for nebulization.

   Salbutamol nebulisation as often as every 20 min for 1 hour as needed, then every 1 - 4 hr as needed, or by continuous nebulisation in life threatening asthma.
3. **Ipratropium bromide:**

   Add Inhaled ipratropium to the Salbutamol if no significant response is seen with the first inhaled salbutamol.

   Ipratropium Nebulizer concentration: 0.25mg (250 microgram) /ml
   - Age < 12 year: 0.25 mg (250 microgram)
   - Age > 12 year: 0.5 mg (500 microgram)

   If poor response, can nebulize every 20-30 minutes for first 1-2 hour, then as needed (4 - 6 hourly), can combine with salbutamol for neublisation.
4. **Corticosteroids**

   Oral Prednisolone:

   1–2 mg/kg/day up to to 40 mg maximum, usually for 3–5 days. Tapering not needed if treatment has been given for less than 2 weeks.

   Hydrocortisone I.V:

if severe or life threatening asthma or if unable to take oral prednisolone.

- Age < 1 year 25 mg 6 hourly.
- Age 1 year -5 year: 50 mg 6 hourly
- Age > 5 year: 100 mg 6 hourly

- change to oral prednisolone once improved and tolerating orally.
- use ranitidine /pantoprazole if taking corticosteroid to decrease gastritis.

5. **Magnesium sulphate:**
   - In Severe asthma, life threatening Asthma or poor response to above medications.
   - 40 mg/kg, maximum dose 2 g, given intravenously over 20 min
   - use 50% injection and dilute to a 10% concentration by diluting required volume with 4 times volume of sodium chloride 0.9%
   - ECG Monitoring, moniter Vitals.

6. **Salbutamol IV (**For Life Threatening Asthma not responding to initial treatment with salbutamol, ipratropium, Hydrocortisone, magnesium sulphate**)**

   Initial bolus dose of salbutamol IV slowly over 5 min
   - Aged < 2 yr: 5 microgram/kg (maximum 250 microgram)
   - Aged > 2 yr: 15 microgram/kg (maximum 250 microgram)

   Dilute to concentration of 50 microgram/ml with Sodium Chloride 0.9% or 5 % Dextrose.

7. **Salbutamol continuous infusion** (for life threatening asthma if no response to above medications)
   - 1–2 microgram/kg/min continuous infusion.
   - If not responding increase up to 5 microgram/kg/min for 1 hr then reduce back to 2 microgram/kg/min.

Dilute to concentration of 200 microgram/ml with Sodium Chloride 0.9% or 5 % Dextrose.

8. **I.V Aminophylline**:

Consider aminophylline for children with Acute severe or life-threatening asthma unresponsive to maximal dose of above Medications.

loading dose: 5 mg/kg (maximum 500 mg) over 20-30 minutes, (Do not give loading dose in patients already receiving oral theophylline or aminophylline) followed by infusion as:

< 12 years: 1 mg/kg/hour infusion

>12 year: 0.5- 0.7 mg/kg infusion

Use Ideal Body Weight for overweight patients. Dilute to concentration of 1mg/mL with Sodium Chloride 0.9% or 5 % Dextrose.

Aminophylline has narrow therapeutic index. Ideally serum aminophylline levels should be checked and dose adjusted accordingly. Moniter for adverse effects and signs of aminophylline toxicity (Muscle tremors especially in hands, Tachycardia, Nausea and vomiting, Headaches, agitation, hyperactivity, Palpitations, Feelings of warmth). Many drugs interact with Aminophylline and can affect plasma concentrations. Check for drug interactions. Do not give aminophylline using the same I.v access as salbutamol infusion (incompatible). Ideally patient receiving Aminophylline should be nursed in I.C.U.

Moniter with Continuous ECG (arrythmia). Moniter Vitals. Send serum potassium 12 hourly (can cause hypokalemia). Once child has improved and is stable, reduce aminophylline dose by 50 % every 6 hourly and gradually stop Aminophylline.

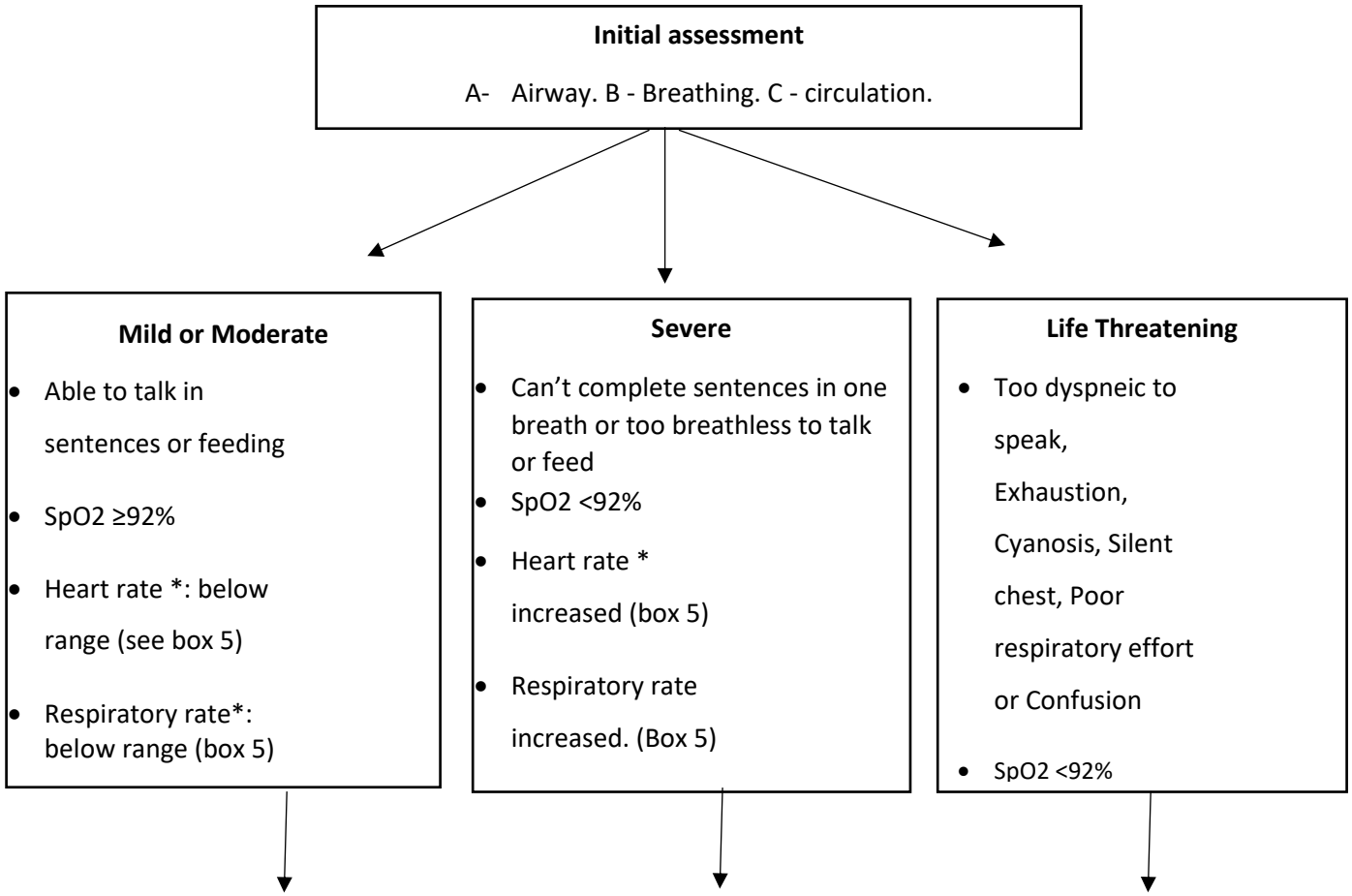
9. **Epinephrine:**1 mg/mL (1: 1000)
    - SC or IM: 0.01 mg/kg (max dose 0.5 mg)
    - For extreme circumstances (e.g., impending respiratory failure despite high-dose inhaled Salbutamol, respiratory failure). Use in Asthma with anaphylaxis and Angioedema

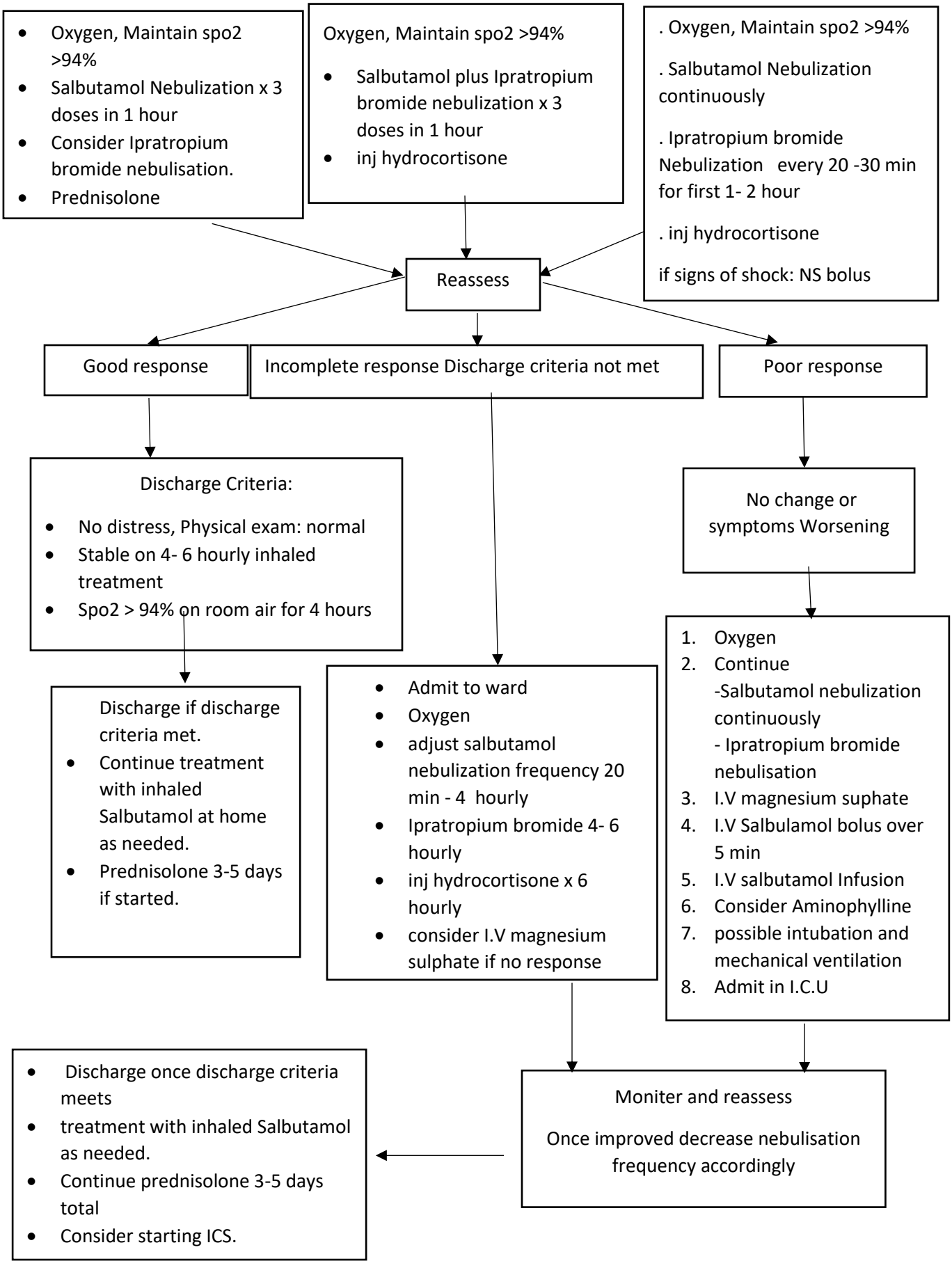
- Antibiotics is not recommended unless there is strong evidence of chest infection.
- Moniter and Reassess
- Monitoring If treated with nebulized or IV salbutamol:
    - Record heart rate and respiratory rate
    - Continuous SpO2

- ECG monitoring
- Baseline urea, creatinine, sodium, potassium.
- 12-hrly potassium for hypokalaemia

- CXR, Blood gas if severe and life-threatening sign/symptoms do not improve with medical management.
- Admit or discharge according to response.
- **If discharged**
  - Continue treatment with inhaled Salbutamol at home as needed.
  - If corticosteroid started, give for 3- 5 days of prednisolone with ranitidine/pantoprazole.
  - start controller medication (MDI ICS or ICS + LABA) if indicated.
  - Provide written asthma action plan for home asthma exacerbation management.
  - follow up within 2–7 days after any exacerbation

Algorithm 2: MANAGEMENT OF ASTHMA EXACERBATION IN HOSPITAL.




Oxygen, Maintain spo2 >94%
Salbutamol Nebulization x 3 doses in 1 hour
Consider Ipratropium bromide nebulisation.
Prednisolone
Oxygen, Maintain spo2 >94%
Salbutamol plus Ipratropium bromide nebulization x 3 doses in 1 hour
inj hydrocortisone
. Oxygen, Maintain spo2 >94%
. Salbutamol Nebulization continuously
. Ipratropium bromide Nebulization every 20 -30 min for first 1- 2 hour
. inj hydrocortisone
if signs of shock: NS bolus
Reassess
Good response
Incomplete response Discharge criteria not met
Poor response
Discharge Criteria:
No distress, Physical exam: normal
Stable on 4- 6 hourly inhaled treatment
Spo2 > 94% on room air for 4 hours
No change or symptoms Worsening
Discharge if discharge criteria met.
Continue treatment with inhaled Salbutamol at home as needed.
Prednisolone 3-5 days if started.
Admit to ward
Oxygen
adjust salbutamol nebulization frequency 20 min - 4 hourly
Ipratropium bromide 4- 6 hourly
inj hydrocortisone x 6 hourly
consider I.V magnesium sulphate if no response
1. Oxygen
2. Continue -Salbutamol nebulization continuously - Ipratropium bromide nebulisation
3. I.V magnesium suphate
4. I.V Salbulamol bolus over 5 min
5. I.V salbutamol Infusion
6. Consider Aminophylline
7. possible intubation and mechanical ventilation
8. Admit in I.C.U
Discharge once discharge criteria meets
treatment with inhaled Salbutamol as needed.
Continue prednisolone 3-5 days total
Consider starting ICS.
Moniter and reassess
Once improved decrease nebulisation frequency accordingly

SECTION 2: MANAGEMENT OF ASTHMA IN CHILDREN ≤ 5 YEARS

Recurrent wheezing occurs in large number of children 5 years and younger, usually with viral upper respiratory tract infections. It is quite difficult to differentiate this with initial presentation of asthma.

Diagnosis of asthma in children ≤ 5 years

It may be difficult to make a confident diagnosis of asthma in children ≤ 5 years, because episodic respiratory symptoms such as wheezing and cough are also common in children without asthma, specially in 0–2 years old.

Features suggesting a diagnosis of asthma in children ≤ 5 years. Box. 6

Feature	Characteristics suggesting asthma
Cough	Recurrent or persistent cough, worse at night or accompanied by some wheezing and breathing difficulties. Cough occurring with exercise, laughing, crying or exposure to tobacco smoke in the absence of an apparent respiratory infection.
Wheezing	Recurrent wheezing, including during sleep or with triggers such as activity, laughing, crying, exposure to tobacco smoke or air pollution
Difficult or heavy breathing or shortness of breath	Occurring with exercise, laughing, or crying
Reduced activity	Not running, playing or laughing at the same intensity as other children
Past or family history	Other allergic disease (atopic dermatitis, allergic rhinitis). Asthma in first-degree relatives
Therapeutic trial with low dose inhaled corticosteroid and as-needed Salbutamol	Clinical improvement during 2–3 months of controller treatment and worsening when treatment is stopped

There is no tests diagnose asthma with certainty in children ≤ 5 years, the following are useful.

- **Therapeutic trial**

A trial of treatment for at least 2–3 months with regular low dose inhaled corticosteroids (ICS) and as-needed short-acting beta2-agonist (SABA). Clinical improvement during 2–3 months of controller treatment and worsening when treatment is stopped may suggest Asthma.

- **Chest X-ray**

If there is doubt about the diagnosis of asthma in a wheezing or coughing child, a plain chest X-ray may help to exclude structural abnormalities.

- **Lung function testing**

Do not perform lung function test in children ≤ 5 years of age.

Assessment of asthma control in children ≤ 5 year

Box 7

Symptom over the last 4 weeks		**Category**		
		Well controlled	**Partly controlled**	**Uncontrolled**
Daytime asthma symptoms for > once a week?	Yes/No	None of these	1–2 of these	3–4 of these
Any activity limitation due to asthma? (Runs/plays less than other children, tires easily during walking/playing?)	Yes/No			
Reliever medication needed > once a week?	Yes/No			
Any night waking or night coughing due to asthma?	Yes/No			

Indication for regular controller treatment

- If the symptom pattern suggests a diagnosis of asthma and respiratory symptoms are uncontrolled.
- > 3 exacerbations in a year.
- If the diagnosis of asthma is in doubt but frequent wheezing episodes requiring salbutamol (e.g > 3 episodes in a year), a diagnostic trial of regular controller treatment for 3 months should be considered.

Box 8

Treatment steps: Children ≤ 5 years

	Step1	Step2	Step 3	Step 4
Preferred	As needed Salbutamol	Daily low dose ICS	-medium dose (double Low dose) ICS	Continue ICS Refer to specialist
Other options	-	Montelukast	- Low dose ICS + montelukast	Medium dose ICS + Montelukast
Reliever	As needed Salbutamol			

ICS: inhaled corticosteroids, See box 11 for ICS dose.

Inhaler device for children:

Choice of Inhaler device depends upon the child ability to use device effectively. In young children, a Pressurized metered-dose inhaler (pMDI) and spacer is the preferred method of delivery of β2 agonists and inhaled corticosteroids. Face mask is required until the child can breathe reproducibly using the spacer mouthpiece. A nebuliser with facemask or Mouthpiece may be required if this is ineffective.

The drug should be administered by single actuation of the metered dose inhaler into the spacer, followed by 5-10 breaths. Ensure the valve is moving when breathing through Valved spacer. If administraton needs to be repeated, wait for 30 seconds -1 minute and repeat the same process.

Spacers should be cleaned monthly by soaking in warm soapy water or detergent for 15 minutes. Rinse and allowe to dry in air. Do not scrub the inside of spacer. The mouthpiece should be wiped off detergent or residue before use. Plastic spacers should be replaced every 6 months - 12 months.

Demonstrate how to use inhaler device. Assess inhaler technique in each review and in uncontrolled Asthma.

Age	**Preferred device**
≤ 3 years	Pressurized metered-dose inhaler plus spacer with face mask
> 3 years	Pressurized metered-dose inhaler plus spacer with mouthpiece. Some children up to 5 years may need face mask.

MANAGEMENT OF EXACERBATIONS IN ≤ 5 YEARS AT HOME
See page 13.

MANAGEMENT OF ACUTE ASTHMA OR WHEEZING IN CHILDREN ≤ 5 YEARS IN HOSPITAL.

- See page 15, see algorithm 2 (page 19)

ASTHMA MEDICATIONS

➢ **Controller medications**:

- These are used for regular maintenance treatment.
- They reduce airway inflammation, control symptoms, and reduce future risks such as exacerbations and decline in lung function.
  e.g inhaled Corticosteroid

➢ **Reliever (rescue) medications:**

- These are provided to all patients for relief of breakthrough symptoms as-needed, including during worsening asthma or exacerbations.
- They are also recommended for short-term prevention of exercise-induced bronchoconstriction.

  e.g Salbutamol

Drug doses in Asthma in children:

Box 9.

Long term Controller medications		
Drug	**Dose**	**Adverse effect**
Inhaled corticosteroids **Beclomethasone dipropionate** **Budesonide** **Fluticasone propionate**	See box 4, 8, 11,12 ,13	oropharyngeal candidiasis, dysphonia. Rinse mouth with water and spit it out after using inhaled corticosteroid.
Leukotriene receptor antagonists **Montelukast**	4 mg HS: 1-5 years of age 5 mg HS: 5-14 years 10 mg HS: ≥ 15 years	No specific adverse effects. Rarely mood changes.
1.Salmeterol **2.Formeterol** **(Use only with ICS.)**	1. 25 mcg - 50 mcg/dose B.D (Max 100 mcg daily) 2. 6-12 mcg /dose B.D (Max 24 mcg daily)	Muscle cramps

Box 10

Reliever (rescue) medications		
Salbutamol ○ Nebulizer: 5 mg/mL ○ 100mcg/puff	(2.5 mg- 5mg) ○ Age < 5 year: 2.5 mg ○ Age <- 5 – 12 years: 2.5 mg- 5 mg ○ Age > 12 year: 5 mg (Mix with Normal Saline to make 3 ml total volume) ○ 1-2 puffs as needed ○ Asthma attack 2-10 puff	Tremor, tachycardia, hypokalemia
Ipratropium bromide Nebulizer: 0.25 mg /mL	< 5 years: 0.25 mg (250 microgram) > 5 years: 0.5 mg (500 microgram)	Drying of mouth and respiratory secretions.
Prednisolone	1-2 mg/kg for 3- 5 days Maxium 40 mg.	increased appetite, fluid retention, weight gain, mood alteration, hypertension, peptic ulcer

Inhaled corticosteroids dose for children:

Box 11

Inhaled corticosteroids for children ≤ 5 years	
Drug	**Low daily dose (mcg)**
Beclometasone dipropionate	100
Budesonide	100
Fluticasone propionate	50

Box 12

Inhaled corticosteroids dose in Children 5 – 12 years			
Drug	**Daily dose (mcg)**		
	Low	**Medium**	**High**
Beclometasone dipropionate	100- 200	200- 400	>400
Budesonide	100-200	200- 400	>400
Fluticasone propionate	50-100	100 - 250	>250

Box 13

Inhaled corticosteroids dose in Children > 12 years			
Drug	**Daily dose (mcg)**		
	Low	**Medium**	**High**
Beclometasone dipropionate	200-400	400–800	>800
Budesonide	200–400	400–800	>800
Fluticasone propionate	100–250	250–500	>500

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