



# Chronic Care for Children with Asthma

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# Case Scenario 1

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## History

3 year old male, presents with cough for 2 days, difficulty breathing, and wheezing. 3<sup>rd</sup> episode in 8 months

## Examination

T=36.8C, no pallor, RR=48breaths/min, chest indrawing, bilateral wheeze

## Treatment

- Nebulized salbutamol 2.5mg in 5mls of Normal Saline
- IV Hydrocortisone 100mg stat
- IV Ceftriaxone 1g stat then syrup cefixime
- Syrup Ascoril 5mls tds for 5 days

**Discharged**

# Case Scenario 2

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## History

12 year old girl with history of cough, mainly dry but sometimes productive. It is on and off, and usually treated with amoxicillin capsules and a syrup, sometimes herbal with some improvement.

## Examination

T=36.8C, normal breath sounds, no added sounds

## Treatment

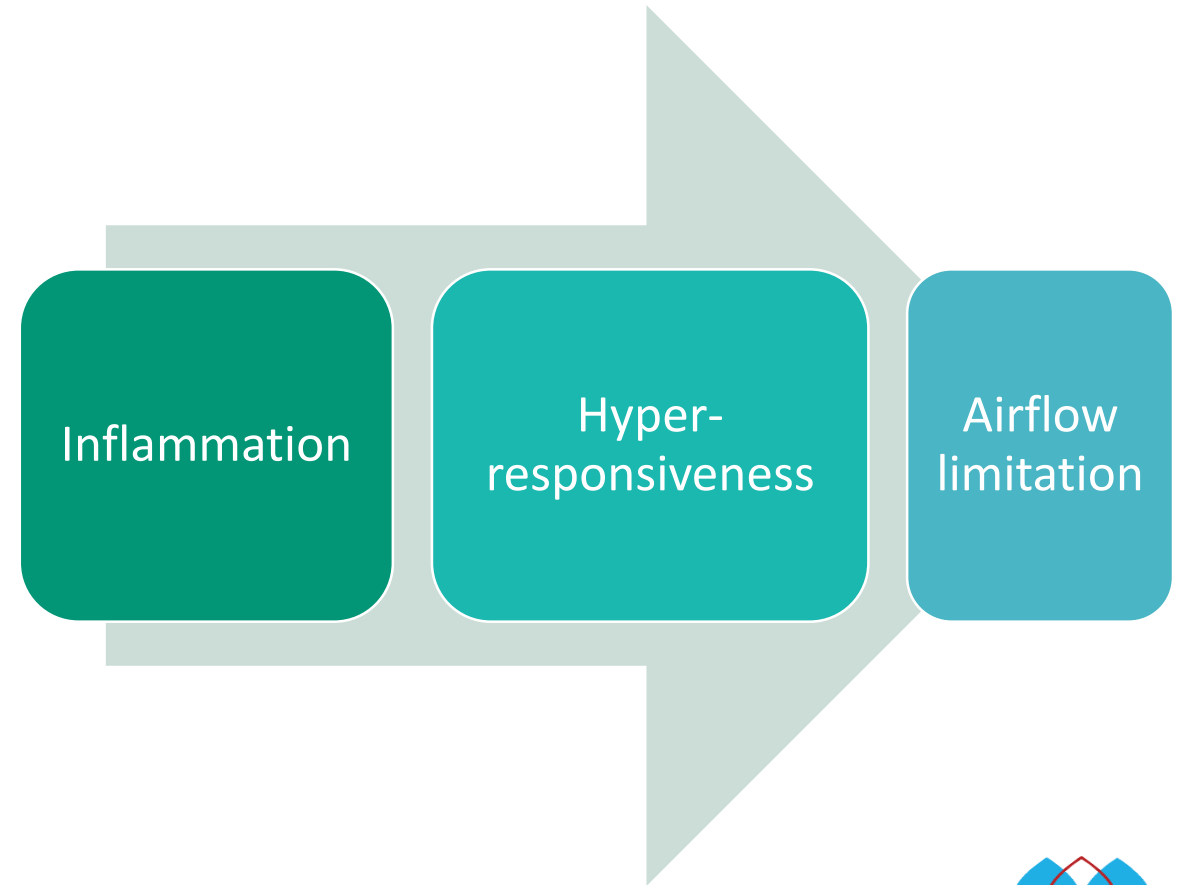
- Tab Azithromycin 500mg once a day for 3 days
- Syrup Ascoril 7.5mls tds for 5 days
- Tab Prednisolone 10 mg tds for 3 days

# What is asthma?

A **heterogeneous** disease characterised by **chronic airway inflammation**, **airway hyper-responsiveness** and **airflow limitation**

It is defined by **history** of symptoms such as **wheeze, shortness of breath, chest tightness** and **cough** that **vary over time** and in **intensity** together with **variable expiratory airflow limitation**

**Airflow limitation can become persistent**




# Diagnostic criteria for asthma in children aged 6-11 years and adolescents

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1. History of variable respiratory symptoms: cough, wheeze, difficulty in breathing, chest pain, chest tightness, family h/o asthma and/or allergies (rhinitis, eczema, etc),
2. Confirmed variable expiratory flow limitation
  - Documented expiratory flow limitation - Reduced FEV1 and FEV1/FVC ratio and
  - Documented variability in lung function
    - Positive bronchodilator reversibility test >12% of predicted
    - Excessive variability in twice-daily PEF over 2 weeks >13%
    - Significant increase in lung function after 4 weeks of anti-inflammatory treatment
    - Positive exercise challenge test
    - Excessive variation in lung function between visits

# Features suggesting asthma in children $\leq 5$ years



Feature	Characteristics suggesting asthma
Cough 	Recurrent or persistent non-productive cough that may be 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 Prolonged cough in infancy, and cough without cold symptoms, are associated with later parent-reported physician-diagnosed asthma, independent of infant wheeze
Wheezing	Recurrent wheezing, including during sleep or with triggers such as activity, laughing, crying or 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; tires earlier during walks (wants to be carried)
Past or family history	Other allergic disease (atopic dermatitis or allergic rhinitis) Asthma in first-degree relatives
Therapeutic trial with low dose ICS and as-needed SABA	Clinical improvement during 2–3 months of controller treatment and worsening when treatment is stopped

# Principles of asthma management

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## Goals of asthma management

- **Symptom Control:** Achieve good symptom control and maintain normal activity
- **Minimize risk** of asthma-associated deaths, exacerbations, fixed airflow limitation, medication side effects

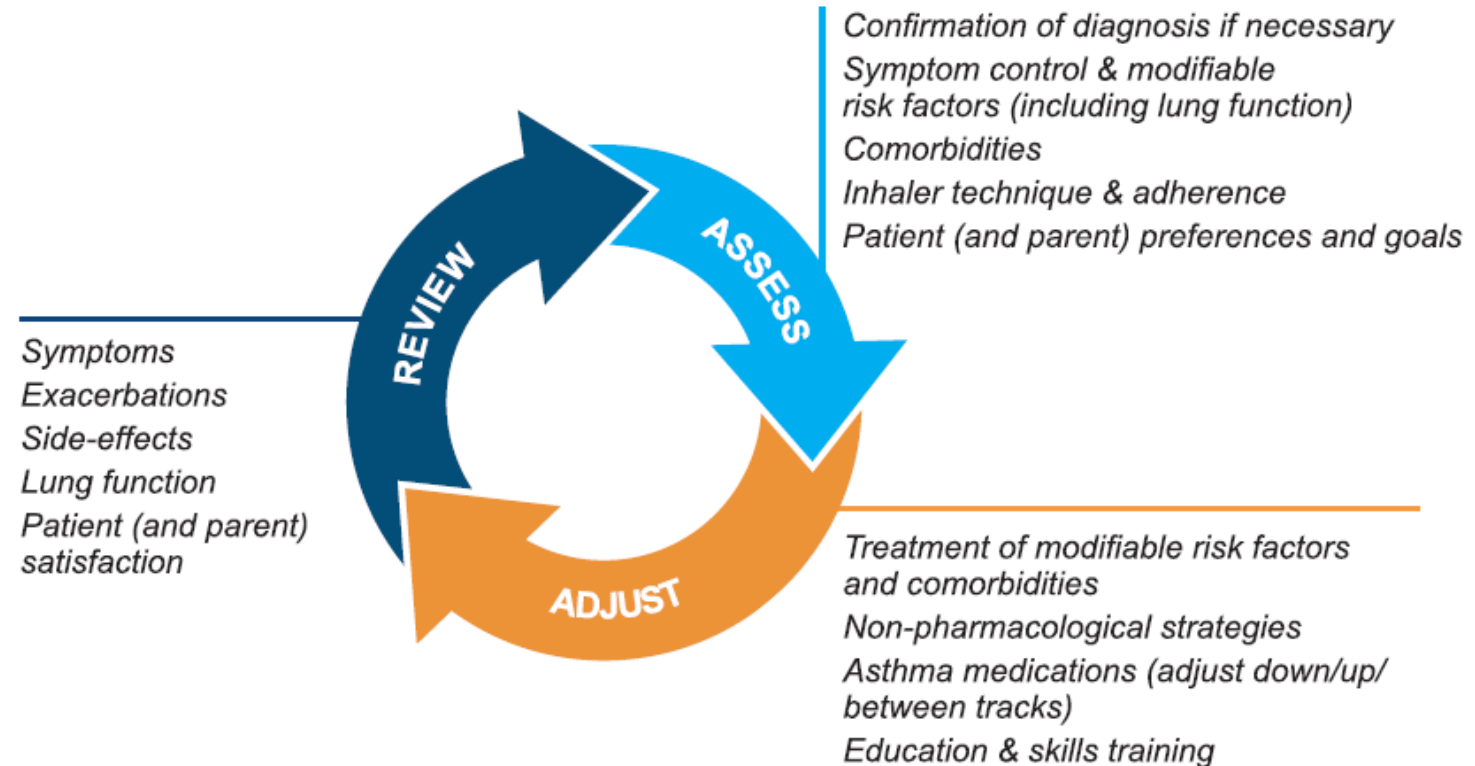
## The patient-health professional partnership

- Self-management education
- Shared decision-making
- Good communication
- Asthma literacy

## Making decisions about asthma

- Asthma treatment is adjusted in a continuous cycle of assessment, treatment and review of response to treatment
- Personalized control-based asthma management - patient characteristics and phenotype

# Asthma management cycle



**FIGURE 2** Personalized asthma management cycle of care. Reproduced by permission from Reference 4 (Box 3-2)

# Treatment: adolescents 12-18 years

Symptoms	Medication	
Daily symptoms, waking at night once a week or more low lung function <b><u>STEP 4</u></b>	<b>Preferred</b> Medium dose ICS-Formoterol as maintenance and reliever therapy (MART)	<b>Alternative</b> Medium/High dose ICS /LABA as maintenance and as-needed SABA
Symptoms most days or waking u at night once a week or more <b><u>STEP 3</u></b>	Low-dose ICS-Formoterol as maintenance and reliever therapy (MART)	Low-dose ICS /LABA as maintenance and as-needed SABA
Symptoms twice a month or more <b><u>STEP 2</u></b>	As-needed Low dose ICS/Formoterol	Low-dose ICS plus as-needed SABA
Symptoms less than twice a month <b><u>STEP 1</u></b>	As-needed Low dose ICS/Formoterol	Take low dose ICS whenever SABA is taken

# Treatment: children 6-11 years

Symptoms	Medication	
Symptoms most days, waking at night once a week or more and low lung function <b><u>STEP 4</u></b>	<b>Preferred</b> Medium dose ICS-LABA with as-needed SABA	<b>Alternative</b> Low-dose MART
Symptoms most days or waking up at night once a week or more <b><u>STEP 3</u></b>	Low-dose ICS-LABA with as-needed SABA	Medium dose ICS with as-needed SABA or Very low-dose MART
Symptoms twice a month or more <b><u>STEP 2</u></b>	Daily ICS with as-needed SABA	
Symptoms less than twice a month <b><u>STEP 1</u></b>	Take ICS whenever SABA is given	

# Treatment: children less than five years

Symptoms	Medication	
Symptoms most days, waking at night once a week or more and low lung function <b><u>STEP 4</u></b>	<b>Preferred</b> Medium dose ICS and refer for expert opinion	<b>Alternative</b> Add LTRA or increase frequency of ICS or add intermittent ICS
Symptoms most days or waking up at night once a week or more <b><u>STEP 3</u></b>	Medium dose ICS with as-needed SABA	Low-dose ICS +LTRA with as-needed SABA
Symptoms twice a month or more <b><u>STEP 2</u></b>	Daily low dose ICS and as-needed SABA	LTRA
Symptoms less than twice a month <b><u>STEP 1</u></b>	As-needed SABA	

## Treatment in children less than five years

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- A **trial** of controller medication for at least 3 months
- Assess response to treatment before continuing medication
- Preferred is pMDI with spacer and mask
- Medication: Inhaled corticosteroids (ICS), LTRA

**ICS/LABA combinations are contra-indicated in  $\leq 5$  years**

# Asthma medicine delivery devices

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# Choosing between controller options

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- Preferred treatment - based on scientific evidence
- Patient characteristics or phenotype
- Patient preference - beliefs, goals, concerns
- Practical issues - inhaler technique, cost, adherence

# Stepwise management – additional components

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## REMEMBER TO:

- Provide guided self-management education
- Treat modifiable risk factors and comorbidities
- Advise about non-pharmacological therapies and strategies
- Consider stepping up if ... uncontrolled symptoms, exacerbations or risks, but check diagnosis, inhaler technique and adherence first
- Consider stepping down if ... symptoms controlled for 3 months + low risk for exacerbations.

# Before stepping up controller medication

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- Re-assess to confirm that symptoms are due to asthma
- Check and correct inhaler technique
- Check adherence
- Consider trial of one of the other options - many children may respond to one of the options
- Inquire about risk factors such as allergens and tobacco smoke exposure

# Summary

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- Comprehensive assessment of symptoms is very key
- Whenever possible, confirm variable expiratory flow limitation
- Identify appropriate step when starting medication
- Review within one month to check response to treatment
- Assess asthma control to guide the step down/up process
- Communication: doctor-patient (caregiver) partnership is very central to good outcomes

# Assessing asthma control

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- For all patients, assess asthma control.

This involves:

- Assessing level of symptom control
- Assessing future risk of poor outcomes
  - Exacerbations
  - Persistent airflow limitation
  - Medication side effects
- Use age-appropriate assessment tools (ACT, cACT, ACQ, etc)

# References

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- Global Strategy for Asthma Management and Prevention (2017)
- Global Strategy for Asthma Management and Prevention (2021)
- Reddel HK, et.al. **Global Initiative for Asthma Strategy 2021: Executive Summary and Rationale for Key Changes.** Respirology 2022