Caribbean Asthma Guidelines

UWI/BAMP CME meeting
November 2015

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Why do we need Caribbean Asthma Guidelines?

Asthma in the Caribbean- concerns

Concerns:

- **High Prevalence**
- **Morbidity**
- **Economic burden**

Asthma in Barbados.

Pearson RBS. *Clin Allergy 1973;3:289-297*

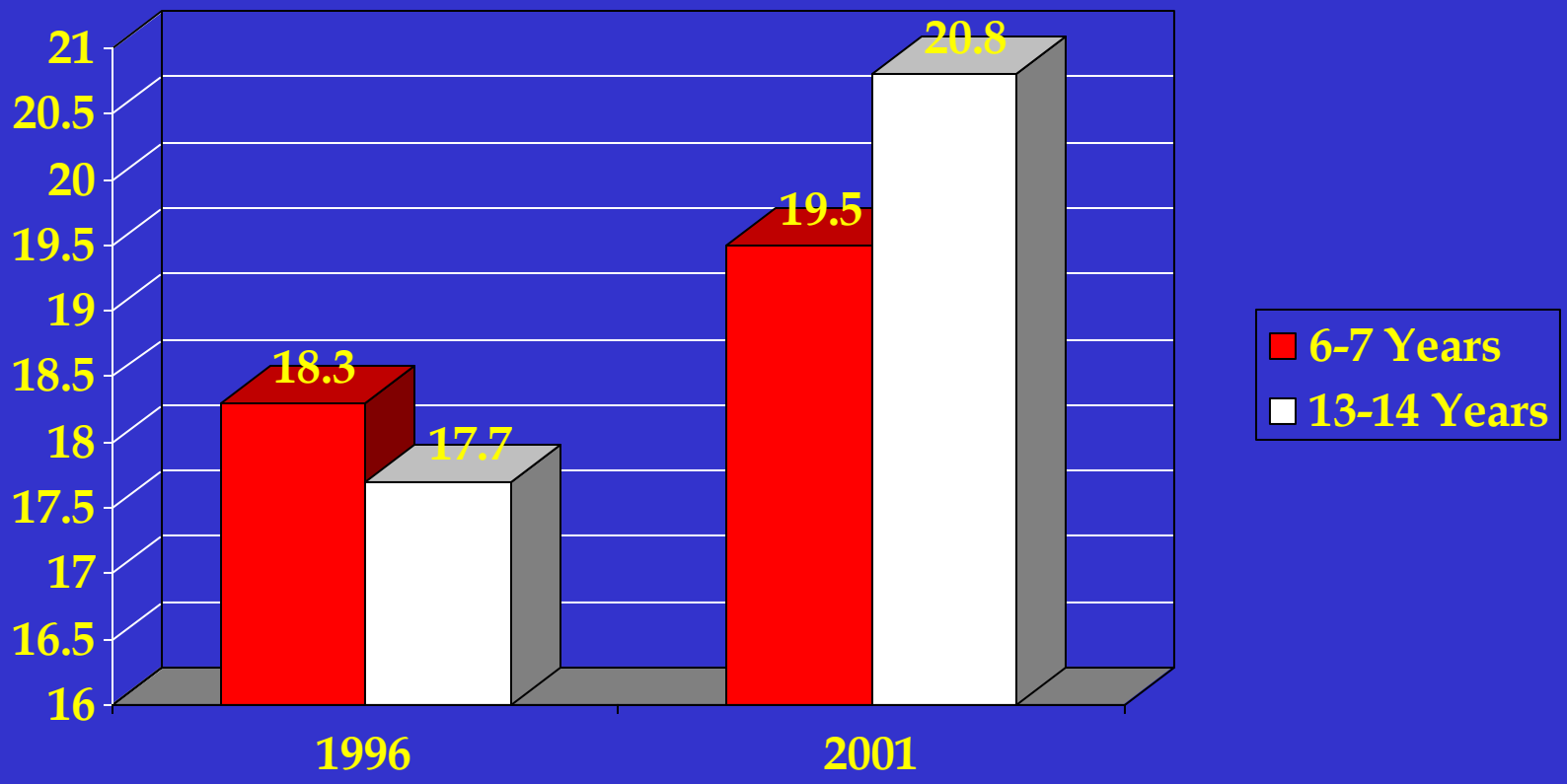
- 2,731 school children between ages 5-15 years surveyed by questionnaire
- 29 had evidence of asthma
- Prevalence of **1.06%**

The International Study of Asthma and Allergy in Childhood- ISAAC- Phase 1 & 111

The Prevalence of Childhood Asthma and Allergy in Barbados- The Barbados National Asthma and Allergy Study.

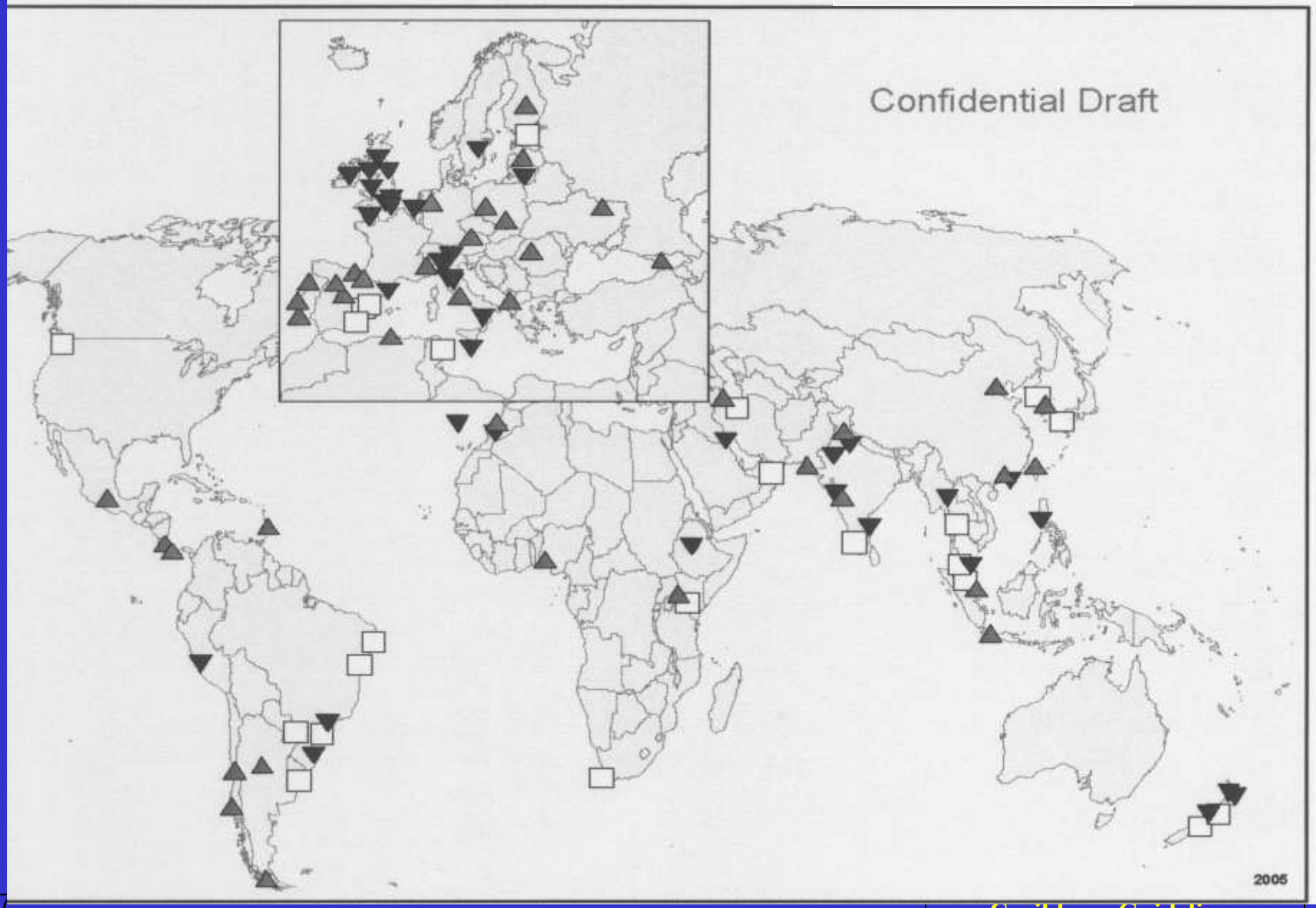
Howitt ME, Naidu R, Roach TC. ***Am. J. Respir. Crit. Care Med. 1998,157:A642***

Change In Prevalence Of Asthma In Barbados Over Five Years – 1996-2001. ISAAC Phase 1 & 111 Studies



Howitt ME, Naidu R, Roach TC. *Am. J. Respir. Crit. Care Med. 1998,157:A642*

ISAAC 2005

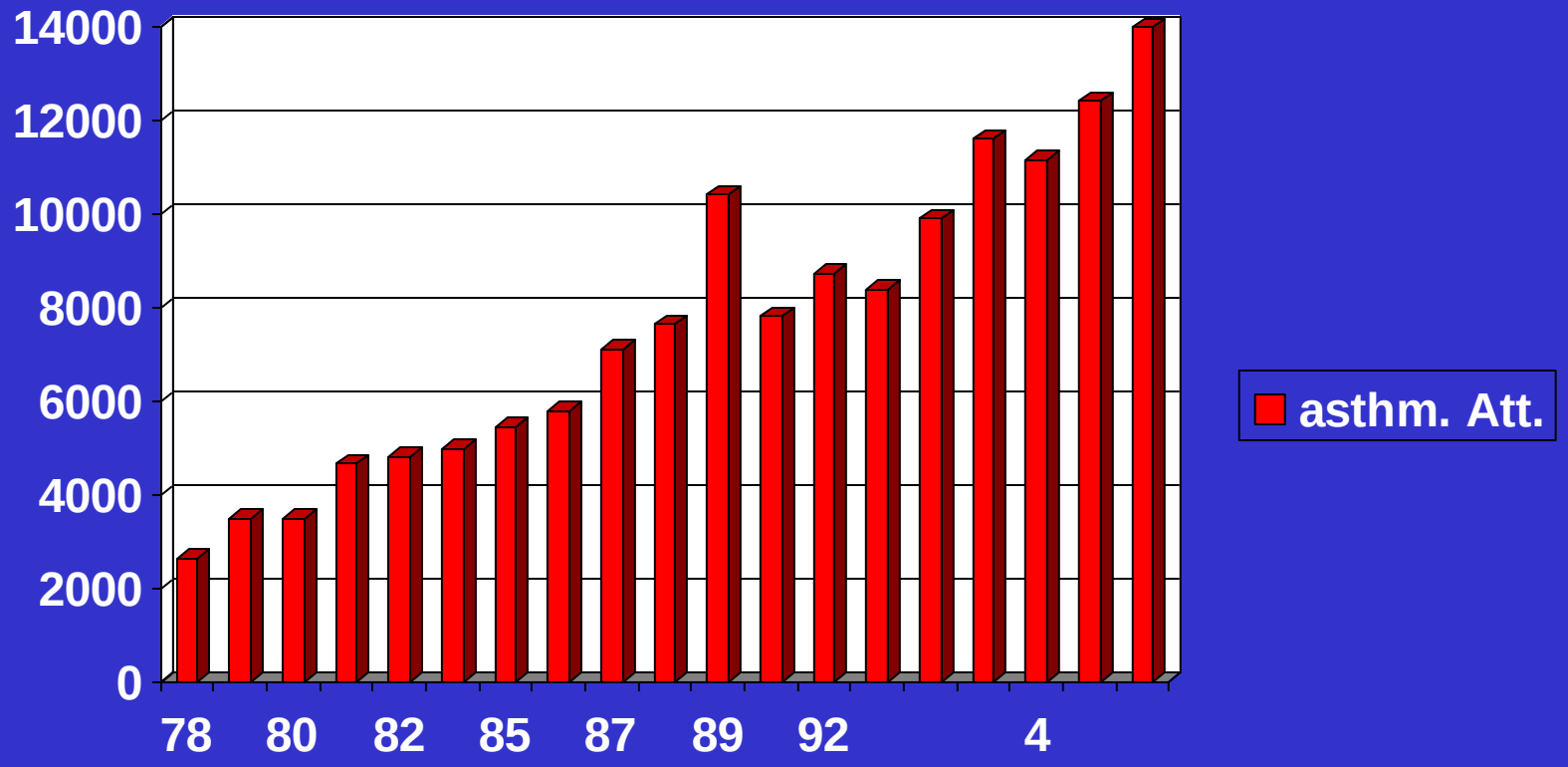


Asthma in the Caribbean- concerns

Concerns:

- **High Prevalence**
- **Morbidity**
- **Economic burden**

Attendance of Asthmatics at the Asthma Bay, Queen Elizabeth Hospital- Naidu, R.



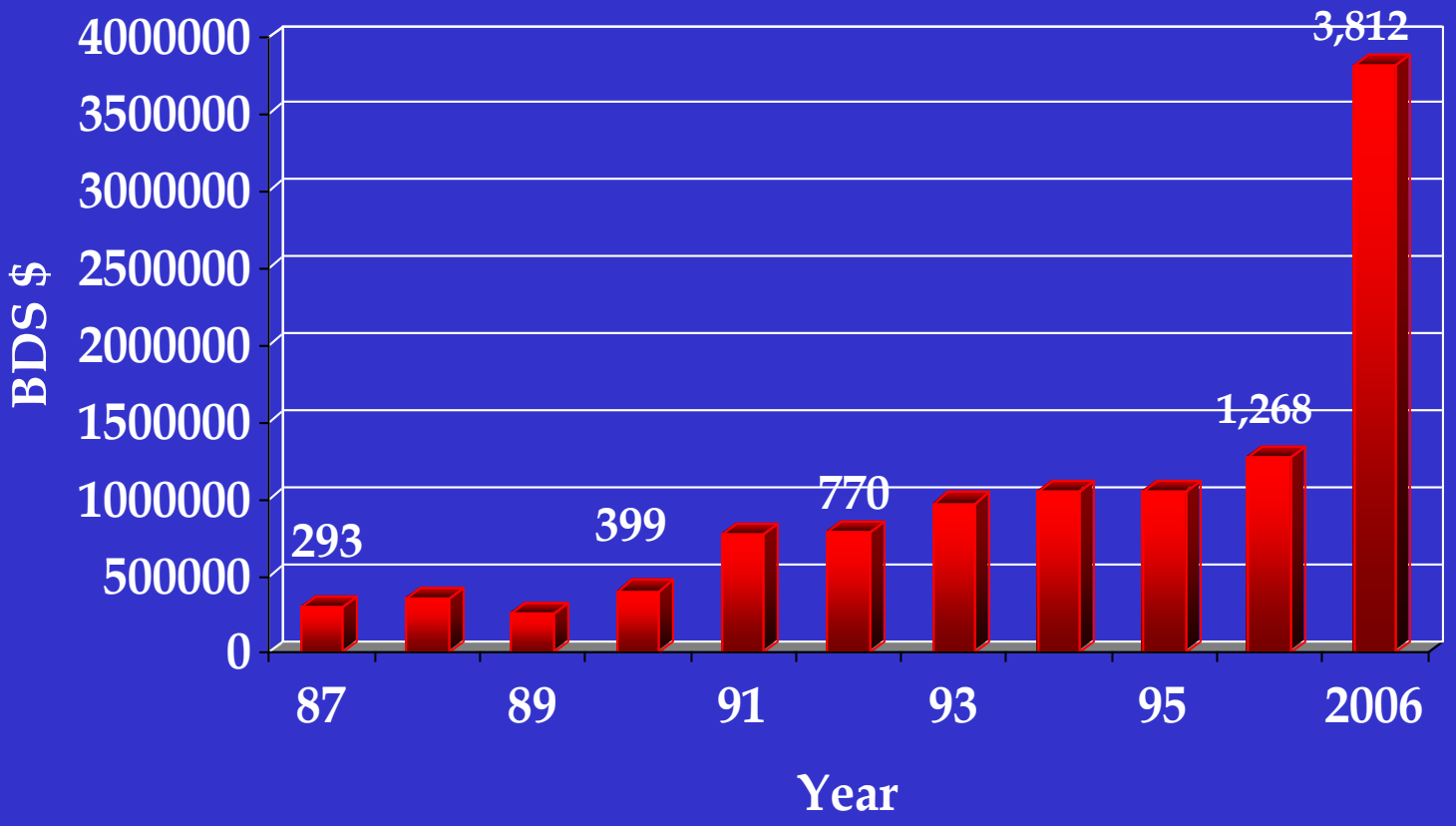
Asthma in the Caribbean- concerns

Concerns:

- **High Prevalence**
- **Morbidity**
- **Economic burden**

Total annual drug cost for treating asthma- 1987-2006.

Howitt ME, Lawrence S, Naidu R. *West Indian Med J 1999;**48**(Suupl.2):60*

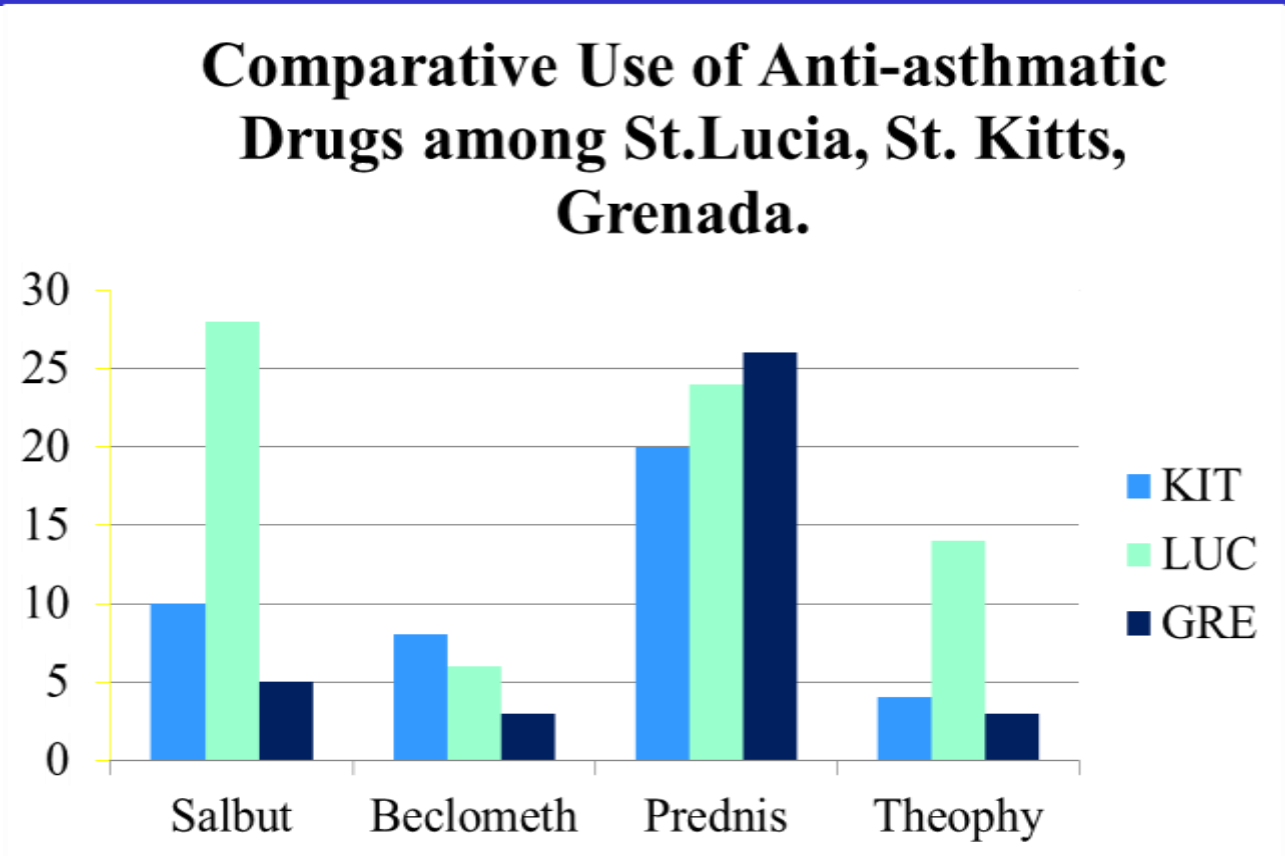


Asthma in the Caribbean- concerns

Variation in the way asthma is treated in the Caribbean

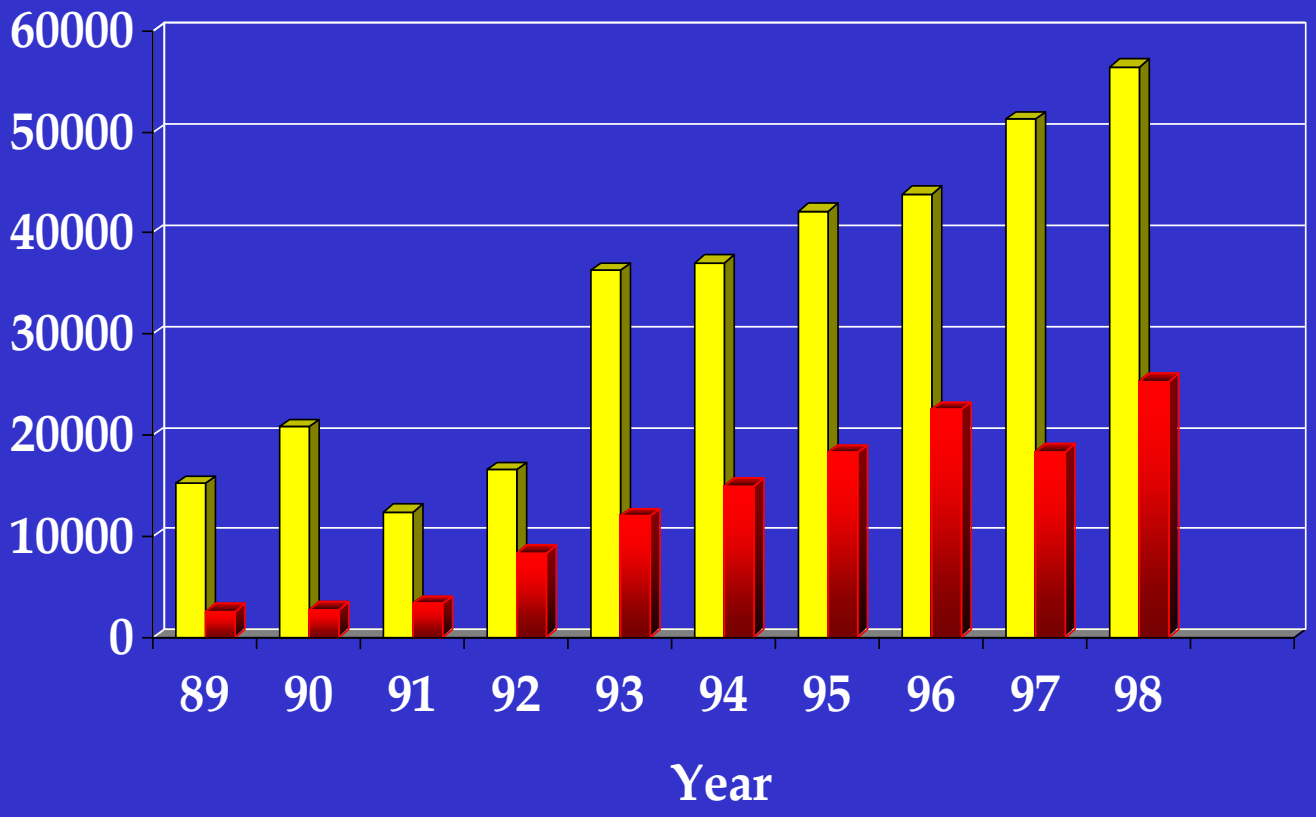
A study of drug utilisation reviews of asthma in three Eastern Caribbean Countries: St. Lucia; Grenada; and St. Kitts-Nevis.

Howitt ME, Burnett F. *Eur Eur Respir J 1998:**12**:52S*



Use of Beta-2-agonists and ICS- Barbados

Compliance with Asthma Guidelines in Barbados- A study of the use of asthma medication. Howitt ME, Lawrence S, Naidu R. *West Indian Med J 1999;**48**(Suupl.2):60*



Caribbean Guidelines

- In response to a **wide variation** in the treatment of asthma across the Caribbean and to concerns about, prevalence, morbidity, mortality and increasing health care cost.
- GINA/CCMRC – **Caribbean Asthma Guidelines** developed at workshop in Trinidad July **1997**
- Guidelines **updated** at CHRC meeting in Trinidad **2007**

CCMRC/GINA WORKSHOP ON ASTHMA MANAGEMENT AND PREVENTION IN THE CARIBBEAN

July 1 - 3, 1997, Trinidad

Commonwealth Caribbean Medical Research Council (CCMRC) David Picou MB BS PhD

Global Initiative for Asthma (GINA) Stephen T. Holgate MD DSc

Dr. Zulaika Ali	Trinidad	Dr. Ikram Hussein	Guyana
Dr. Neleen Baboolal	Trinidad	Dr. Rohan N. Jabour	Guyana
Dr. Beni Balkaran	Trinidad	Dr. Cavelle Kelsick-Hobson	St. Kitts
Dr. R. Bascombe-Adams	St. Vincent	Dr. Paula M. Lashley	Barbados
Prof. Jean Bousquet	France	Dr. Francis Longsworth	British Virgin Is
Dr. K.S. Brightly-Brown	Jamaica	Dr. Deepak Mahabir	Trinidad
Mr. Francis Burnett	St. Lucia	Dr. Edmond Mansoor	Antigua
Dr. Michael Camps	St. Lucia	Dr. Patrick Martin	St. Kitts
Dr. Didier Caparros	Guadeloupe	Dr. Raana Naidu	Barbados
Prof. Tim Clark	England	Dr. Orville Nembhard	Jamaica
Dr. Charlton Collie	Jamaica	Dr. Ernest Pate	Barbados
Dr. Michele Collins-Harris	Guyana	Dr. Martyn Partridge	England
Dr. Jacques de Thore	Martinique	Dr. Albert Persaud	Trinidad
Dr. Martin Didier	St. Lucia	Dr. Hardatt Persaud	Guyana
Dr. Maria Dillon-Remy	Tobago	Dr. Lexley Pinto-Pereira	Trinidad
Dr. Jennifer Elwin	Dominica	Dr. Timothy Roach	Barbados
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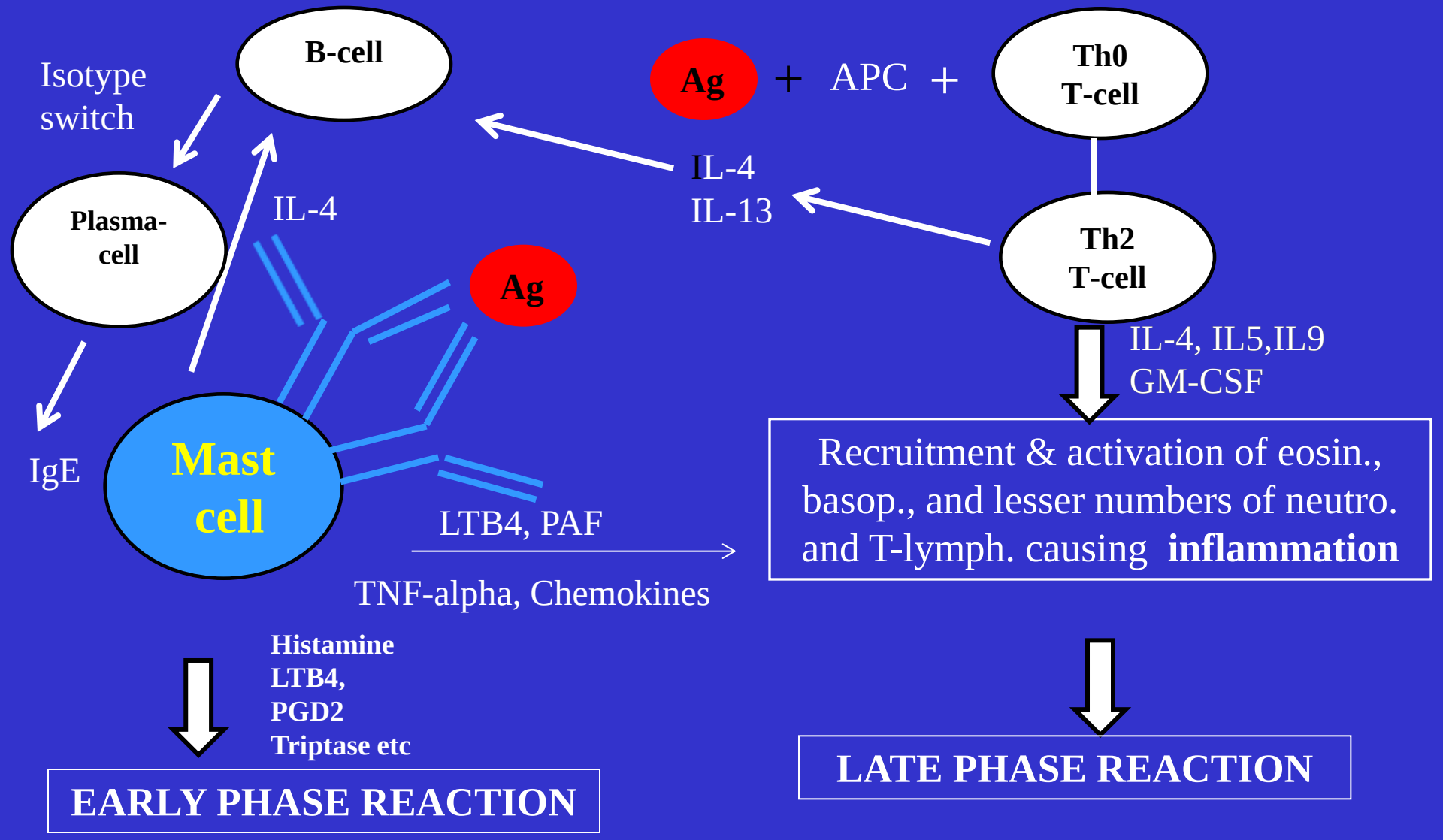
Dr. Vanessa Gill	British Virgin Islands	Dr. Donald Simeon	Trinidad
Mrs. Patricia Hanley	British Virgin Islands	Dr. Ira Simmons	St. Lucia
Dr. Kelvin Holloway	U.S.A.	Ms. V.S. Taggart	U.S.A.
Dr. Malcolm Howitt	Barbados		

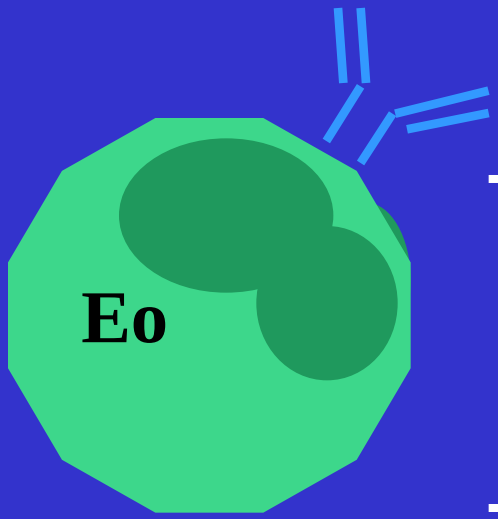
What is asthma?

Guidelines definition of Asthma

Asthma is a **heterogeneous** disease, usually characterised by chronic airway inflammation. It is defined by the history of respiratory symptoms such as **wheeze**, **shortness of breath**, **chest tightness** and **cough**, that **vary** over time and intensity, together with **variable** expiratory limitation.


B-cell
Isotype switch
Plasma-cell
IgE
IL-4
Ag
Mast cell
Ag + APC +
Th0 T-cell
IL-4
IL-13
Th2 T-cell
IL-4, IL5,IL9
GM-CSF
Recruitment & activation of eosin., basop., and lesser numbers of neutro. and T-lymph. causing inflammation
LTB4, PAF
TNF-alpha, Chemokines
Histamine
LTB4,
PGD2
Triptase etc
EARLY PHASE REACTION
LATE PHASE REACTION

Eosinophils in Asthma



Basic Proteins

MBP **EDN**

ECP **EPO**

Mediators

PAF **TNF-(alpha)**

LTC4 **IL-5**

GM-CSF

Inhibited by corticosteroids

Asthma Phenotypes and Endotypes

Asthma is a **heterogeneous** disease, with different underlying disease processes.

Recognisable clusters of demographic, clinical and/or pathophysiological characteristics are often called **asthma phenotypes.**

Guidelines Diagnosis of asthma

There is no specific diagnostic test for asthma.

Measurement of lung function to confirm **airflow limitation** and the demonstration of **reversibility** of lung function abnormalities, greatly enhance diagnostic confidence.

Clinical Diagnosis

The diagnosis of asthma is based on the clinical symptoms of:

- **Wheeze**
- **Chest tightness**
- **Shortness of breath**
- **Cough**

Vary over time and vary in intensity.
Often worse at night or on waking.
Often triggered by exercise, allergens exposure, irritants (exhaust fumes, smoke), cold air.
Often appears or worsen by viral infections

Lung Function

- Measurement of lung function provides an assessment of severity of **airflow limitation**, its **reversibility** and **variability**, and provides confirmation of the diagnosis of asthma

Measurement of lung function:

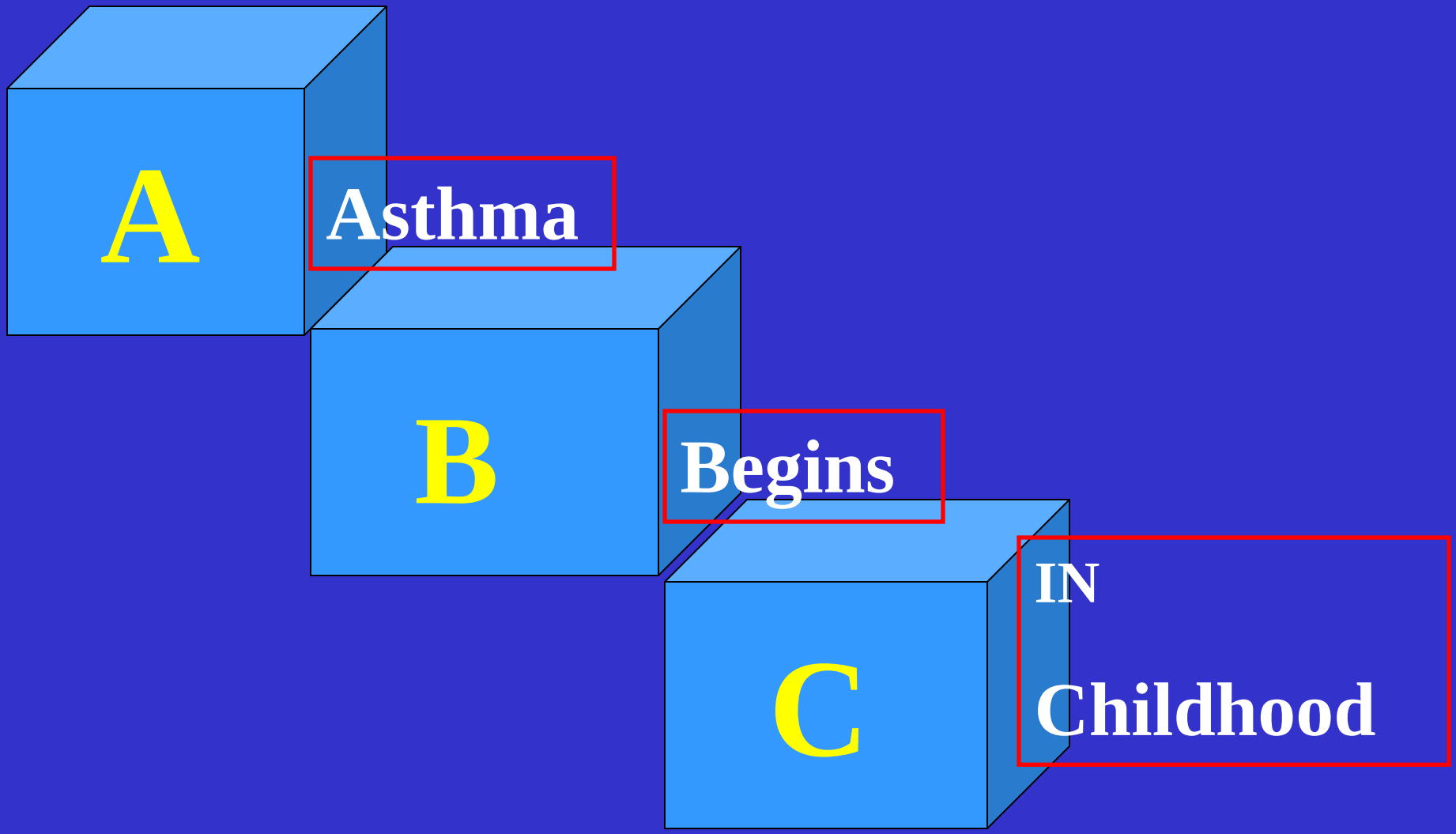
Two methods widely used to measure lung function:

- Spirometry- particularly the measurement of forced expiratory volume in 1 second **FEV1** and forced vital capacity **FVC**
- Peak expiratory flow rate **PEF**
- Predicted values of PEV1, FVC and PEF based on age, sex and height are obtained from population studies.

Diagnosing asthma

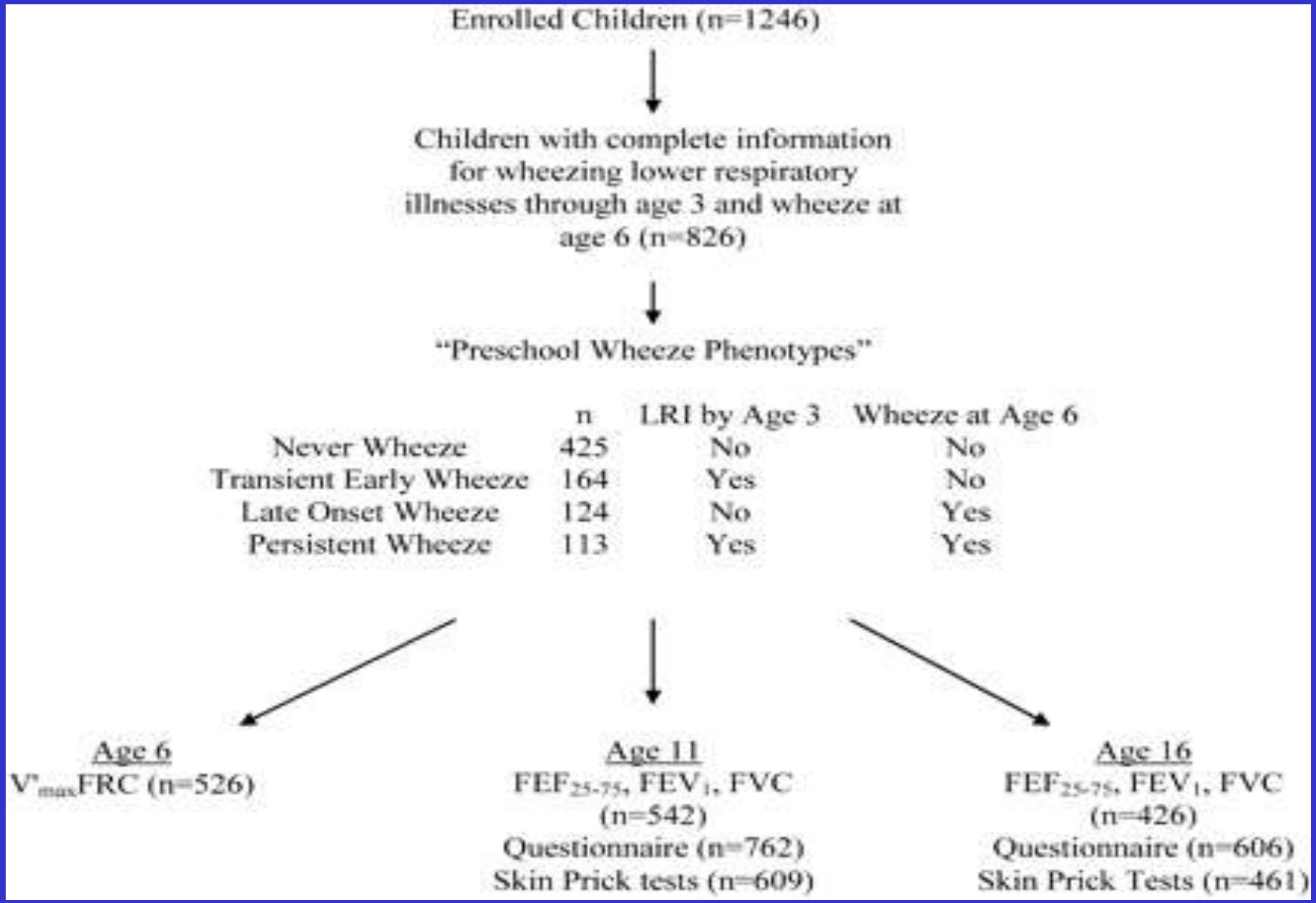
Diagnostic Challenges

Children Under 5 Years


A
Asthma
B
Begins
C
IN
Childhood

Wheezing in preschool children

- Recurrent wheezing occurs in a large proportion of children 5 years and younger, typically with viral upper respiratory tract infections which occurs around 6-8 times per year.
- Wheezing in this age group is a highly **heterogeneous** condition and **not** all wheezing in this age group indicates asthma.
- Many young children wheeze with viral infections
- Deciding whether wheezing with a respiratory infection is truly an initial or recurrent presentation of asthma is **difficult**.



F.D. Martinez et al Am J Respir Crit Care Med 2005;172:1253-1258.

Wheezing Phenotypes in preschool children

Prospective allocation of individual children to these phenotypes have been unreliable in real-life clinical situations, and the clinical usefulness of these systems remains a subject of active investigation.

Wheezing in preschool children

Many young children wheeze with viral infections and deciding when a child should be treated with **controller** is difficult.

The **frequency** and **severity** of wheezing episodes and the **temporal** pattern of symptoms (only with viral colds or in response to other triggers) should be taken into account.

Any control treatment should be viewed as a treatment trial, with follow up scheduled after 2.-3 months.

Wheezing in preschool children

A positive **family history** of allergic disorders or the presence of **atopy** or allergic sensitisation provide additional predictive support, as early allergic sensitisation increases the likelihood that a wheezing child will develop persistent asthma.

Symptoms (cough, wheeze, heavy breathing) < 10 days during URTI	Symptoms (cough, wheeze, heavy breathing) > 10 days during URTI	Symptoms (cough, wheeze, heavy breathing) > 10 days during URTI
2-3 episodes per year	>3 episodes per year or severe episodes and /or night worsening	>3 episodes per year or severe episodes and /or night worsening
No symptoms between episodes	Between episodes child may have occasional cough, wheeze or heavy breathing.	Between episodes child has cough, wheeze or heavy breathing during play or when laughing
		Atopy or familty history of asthma

Assessment of the asthmatic patient

Control of Asthma

The updated Guidelines now advocate that therapeutic changes are driven by one simple question-

“ Is the patient’s asthma controlled?”

Control of Asthma

Control is one of the main treatment targets and therefore the main determinant of therapeutic decisions in a patient who is already treated.

Controlled

Criterion	Value of Frequency
Day-time symptoms	None
Night symptoms	None
Physical activity limitations	None
Exacerbations	None
Use of short-acting beta2 agonists	None
FEV1 or PEF	Normal

Partly Controlled

Criterion	Value of Frequency
Day-time symptoms	
Night symptoms	
Physical activity limitations	
Exacerbations	1 or more/year
Use of short-acting beta2 agonists	
FEV1 or PEF	< 80% predicted

1-2 of these features present in any week

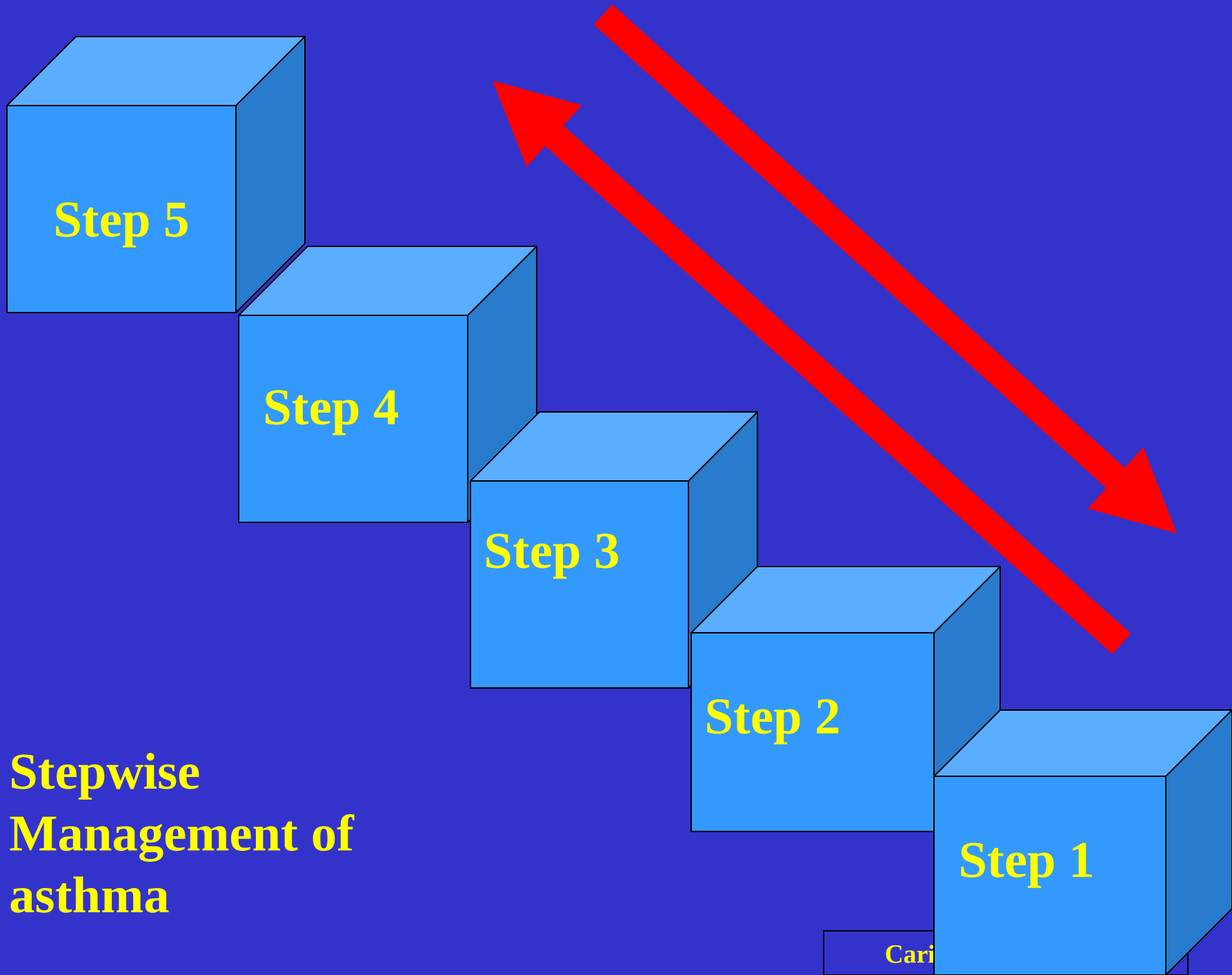
Uncontrolled

Criterion	Value of Frequency
Day-time symptoms	**3 or more features present in any week**
Night symptoms	
Physical activity limitations	
Exacerbations - one in any week	
Use of short-acting beta2 agonists	
FEV1 or PEF < 80% predicted	

Management approach based on Control

for children older than 5 years, Adolescents and Adults.

Level of control		Treatment action
Controlled	Reduce	Maintain and find lowest controlling step
Partly controlled		Consider stepping up to gain control
Uncontrolled	Increase	Step up until controlled
Exacerbation		Treat as exacerbation

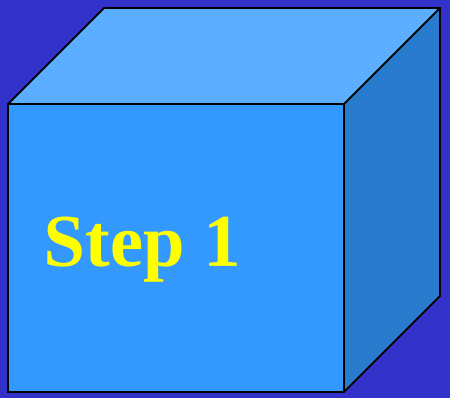


Stepwise Management of asthma

Stepwise Management of asthma

Untreated patients with **occasional** day time symptoms (cough, wheeze, dyspnoea occurring twice or less/week or less frequently if nocturnal) of **short duration** (lasting only few hours). Between episodes, the patient is asymptomatic with **normal** lung function and **no** nocturnal awakening.

As needed rapid acting beta- 2 agonist (SABA)



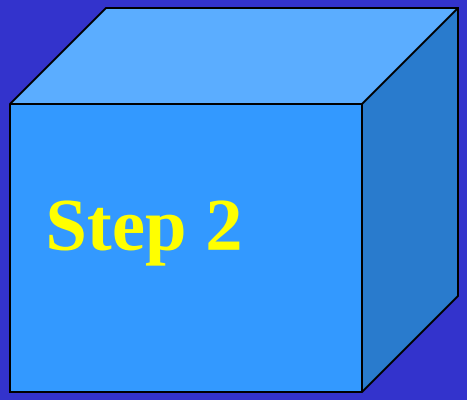
Stepwise Management of asthma

Step 2 is the initial treatment for most treatment naïve patients with **persistent** asthma symptoms

A single controller + as-needed SABA:

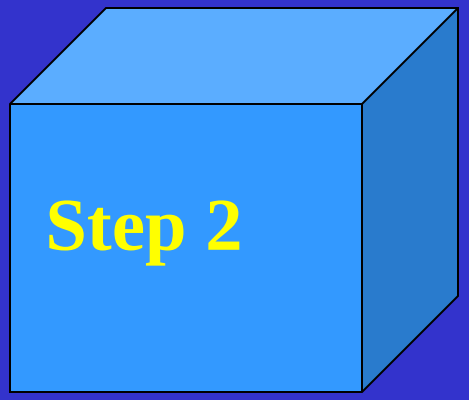
Low-dose ICS is recommended as the initial controller for asthma patients of all ages.

or Leukotriene modifier- less effective than low dose ICS

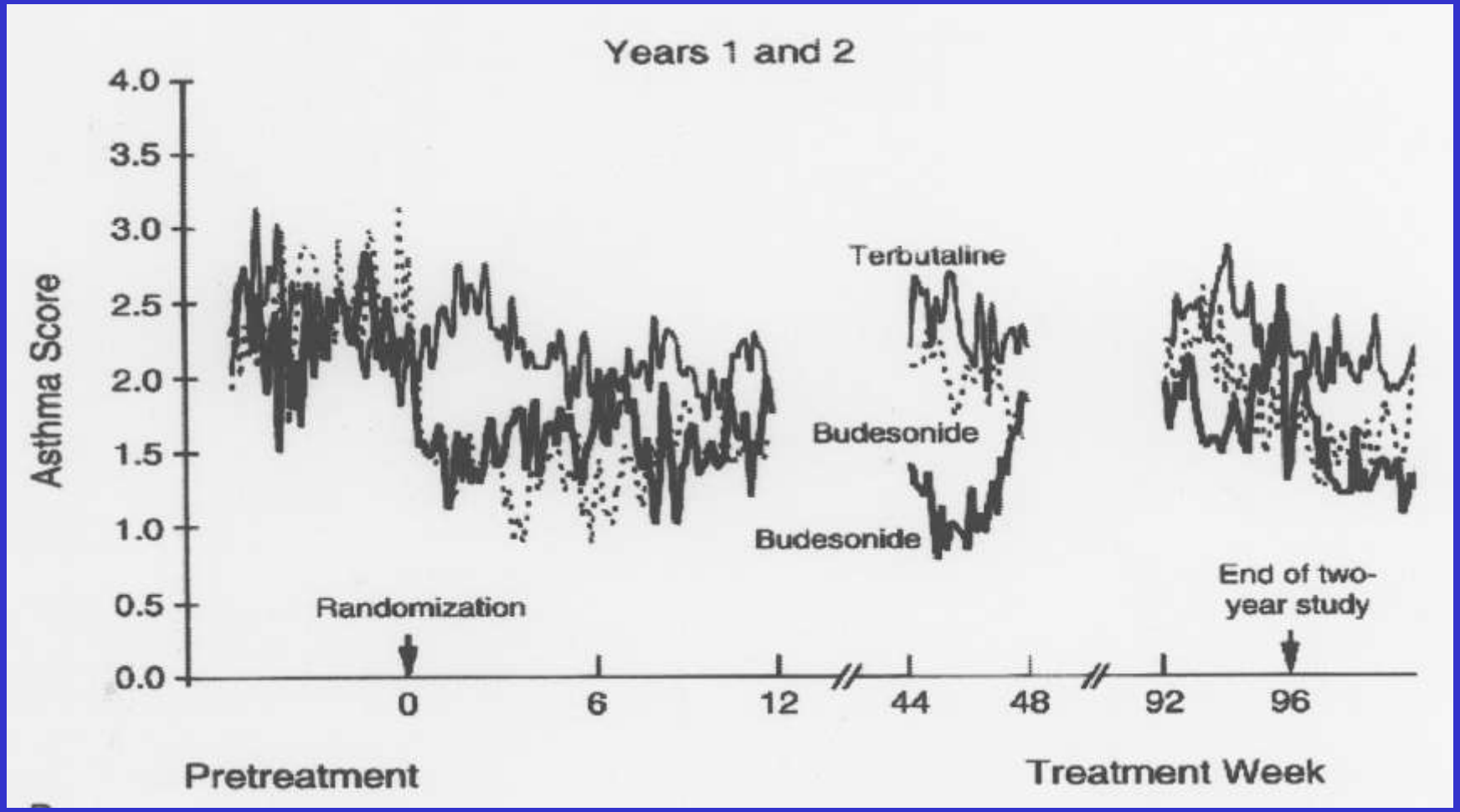


Stepwise Management of asthma

Treatment with ICS at low doses reduces asthma symptoms, increase lung function, improves quality of life, and reduces the risk of exacerbations and asthma-related hospitalisations or death.



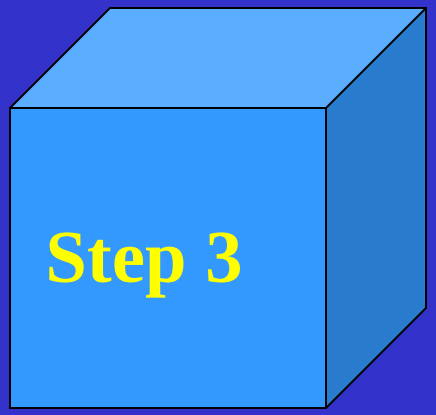
Haathela T et al. Comparison of beta-2-agonist, terbutaline, with inhaled corticosteroid, budesonide, in newly detected asthma. *N Eng J Med 1991;325:388-392.*



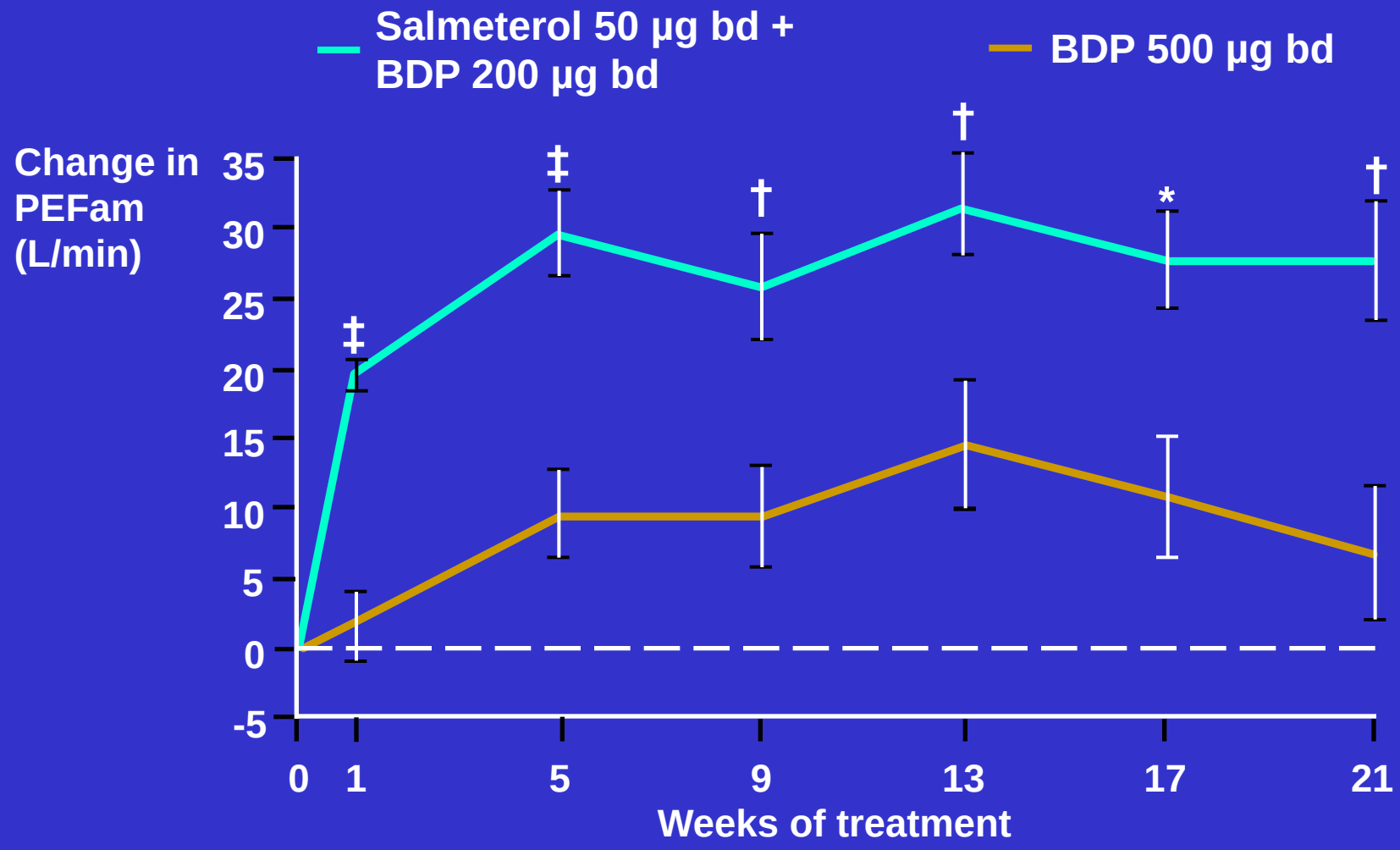
Stepwise Management of asthma

Chose one

- **Low-dose ICS plus long acting beta 2 agonist – recommended** option
- or Medium or high dose ICS or
- Low dose ICS plus leukotriene modifier or
- Low-dose ICS plus sustained release theophyline



Changes from baseline in mean morning PEF during treatment for 21 weeks

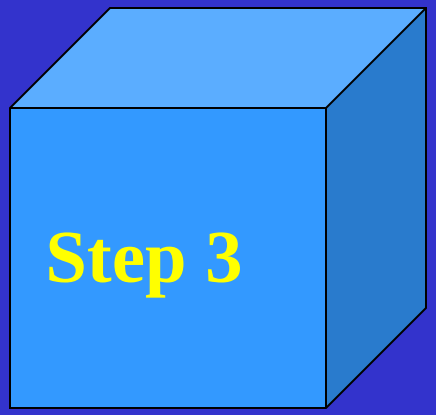


* p<0.05; † p<0.01; ‡ p<0.001

Greening et al 1994

Stepwise Management of asthma

Preferred option for children
6-11 years

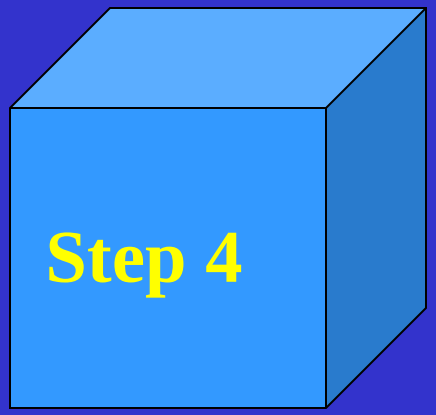


Moderate dose ICS + As-needed SABA

Stepwise Management of asthma

Before stepping up to step 4 check for

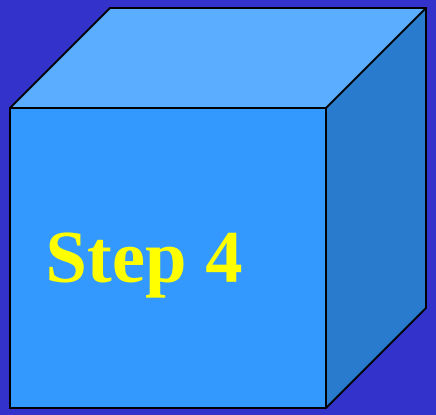
- Incorrect use of inhaler
- Poor adherence
- Environmental exposures
- Confirm that symptoms are due to asthma



Stepwise Management of asthma

Add one or more

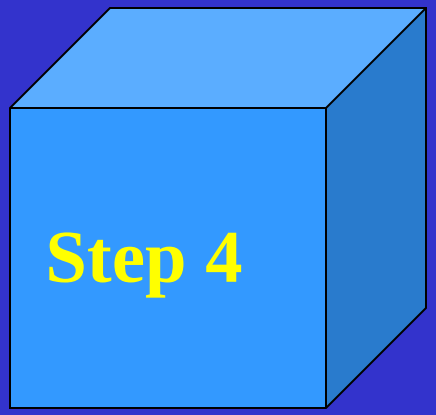
- **Medium or high dose ICS + long acting beta 2 agonist-recommended**
- Tiotropium by soft-mist inhaler
- Leukotriene modifier
- Sustained release theophyline



Stepwise Management of asthma

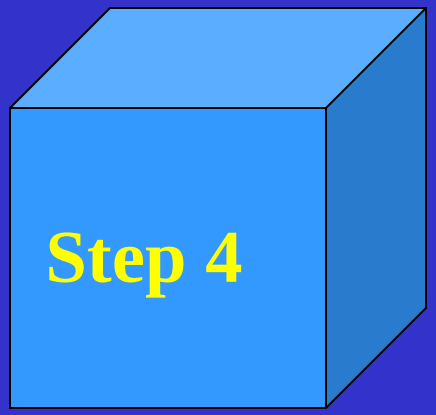
Tiotropium by soft mist inhaler may be used as an add-on therapy for adult patients with a history of exacerbations.

It is not indicated in children < 18 years



Stepwise Management of asthma

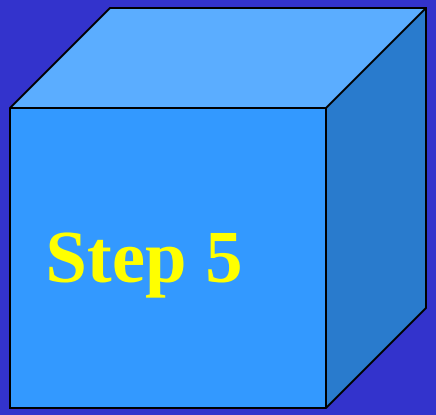
For children 5-11 years, if asthma is not well controlled on moderate dose of ICS, refer for expert assessment and advice.



Stepwise Management of asthma

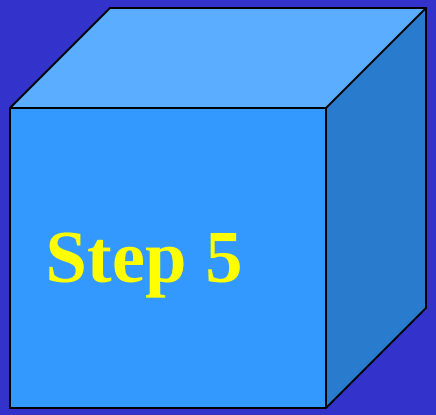
Add one or both

- Oral glucocorticosteroid (lowest dose)
- Tiotropium
- Anti-IgE treatment



Stepwise Management of asthma

Patients with persistent symptoms or exacerbations despite correct inhaler technique and good adherence with Step 4 treatment and in whom other control options have been considered, should be referred to specialist with expertise in managing severe asthma.



Treating to achieve control

- The patient's current **level of control** and **current treatment** determine the selection of pharmacological treatment
- If asthma is **not controlled** on the current treatment regime, treatment should be **stepped up** until control is achieved.
- If control has been maintained for at least 3 months, treatment can be stepped down to lowest step and treatment that maintains control.

Treating to achieve control

- ***Step*** 2 is the **initial** treatment for most treatment-naïve patients with persistent asthma symptoms.
- If symptoms at the initial consultation suggests that asthma is **severely** uncontrolled, treatment should be commenced at ***Step*** **3**
- At each treatment step, a **reliever medication** (SABA), should be provided for quick relief of symptoms.

Monitoring to maintain control

- Once asthma control has been achieved, ongoing **monitoring** is essential to maintain control and to establish the lowest step and dose of treatment.
- Asthma is a **variable** disease, and treatment has to be **adjusted** periodically in response to loss of control as indicated by worsening of symptoms or development of exacerbations.
- Patients should be seen 1 to 3 months after initial visit and every 3 months thereafter.

Monitoring to maintain control

At each visit assess:

- Asthma **control**
- **Adherence**
- **Inhaler technique**

Stepping **down** treatment when asthma is controlled

- When **ICS alone** in medium to high-doses are being used, a 25-50% **reduction** in dose should be attempted at 3 months intervals

- When control is achieved at low-dose of ICS alone, treatment may be switched to **once-daily** dosing

Stepping down treatment when asthma is controlled

- When asthma is controlled on a **combination of ICS and LABA**, the preferred approach is to begin by **reducing the dose of the ICS** by approx. 50% while continuing the LABA. If control is maintained further reductions in ICS should be attempted until a low-dose is reached. Reduce ICS/LABA to once daily. **Discontinuing** LABA is more likely to lead to **deterioration.**

Stepping down treatment when asthma is controlled

- **Controller treatment may be stopped** if the patient's asthma remains controlled on the lowest dose of controller and no recurrence of symptoms for **1 year**.

Stepping up treatment in response to loss of control

Treatment has to be adjusted periodically in response to **worsening control**. Treatment options are as follows:

- **Rapid-onset, short-acting or long-acting beta 2 agonists bronchodilators.** Repeated dosing with bronchodilators in this class provides temporary relief until the cause of the worsening symptoms passes. The need for repeated doses over more than 1 or 2 days signals the **need** for review and possible **increase** of controller therapy

Stepping up treatment in response to loss of control

- **ICS-** Temporarily doubling the dose of ICS has **not** be demonstrated to be effective, and is no longer recommended.

Stepping up treatment in response to loss of control

- **Combination of ICS and rapid and long acting beta 2 agonist bronchodilator (e.g. fomotorol) for combined and relief of control.**

The use of the combination of rapid and long acting beta 2 agonist (formoterol) and ICS (budesonide) in a single inhaler both as a controller and reliever is effective in maintaining high level of asthma control and reduces exacerbations requiring systemic glucocorticosteroids and hospitalisation.

Management of Worsening Asthma and Exacerbations

Management of Asthma Exacerbations

- Exacerbations (flare-up) represent an acute or subacute worsening of symptoms and lung function from the patient's usual status, or in some cases the initial presentation of asthma.

Management of Asthma Exacerbations

- Patients who are at increased **risk** of asthma related-death should be identified, and flagged for more frequent review.
- The management of worsening asthma and exacerbations is part of a continuum from **self-management** by the patient with a **written asthma action plan**, through to management of more severe symptoms in primary care, the emergency depart and in hospital.

Management of Asthma Exacerbations

- All patients should be provided with a **written** asthma action plan appropriate for their level of asthma control.
- The action plan should be when and how to **change** the reliever and controller medications, use of oral steroids, and access medical care if symptoms fail to respond to treatment.
- Patients who deteriorate quickly should be advised to see their doctor or go to the A&E.
- The action plan can be based on symptoms or PEF

Management of Asthma Exacerbations in Primary Care Setting

PRIMARY CARE Patient presents with acute or sub-acute asthma exacerbation

Assess Patient

Is it asthma?

Risk factors for asthma-related deaths

Severity of exacerbation

Mild or Moderate

Talks in phrases, prefers sitting to lying, not agitated, resp. rate increased, accessory muscles not used. Pulse 100-120 beats, O2 sat. (on air) 90-95%

PEF > 50%

Start treatment

SABA 4-10 puffs by MDI + spacer, repeat every 20 mins for 1 hr
Prednisolone: adults 1mg /kg. max. 50mg. Children 1-2mg/kg max. 40 mg. **Controlled O2:** (if available) target saturation 93-95% (children 94-98%)

Improving

Worsening

Transfer to A & E

While waiting: give SABA + ipratropium bromide + O2 + systemic corticosteroid

Continue treatment with SABA as needed
Assess response at one hour (or earlier)

ASSESS FOR DISCHARGE

Symptoms improved, not needing SABA
PEF improving and >60-80% or personal best or predicted
Oxygen saturation > 94% room air
Resources at home adequate

FOLLOW UP

Reliever: reduce to as needed
Controller: continue higher dose for short teerm (1-2 weeks) or long term (3 months) depending on background to exacerbation
Risk factors: check and correct modifiable risk factors that may have contributed to exacerbation, including inhaler technique and adherence.
Action Plan: Is it understood? Was it used appropriately? Does it need modification.

Assess Patient

Is it asthma?

Risk factors for asthma-related deaths

Severity of exacerbation

SEVERE

Talks in words, sits hunched forwards, agitated, resp. rate > 30/min, accessory muscles in use. Pulse rate >120 bpm. O2 sat. (on air) < 90%. PEF < 50 % predicted or best.

LIFE-THREATENING

Drowsy, confused or silent chest

Transfer to A & E

While waiting: give SABA + ipratropium bromide + O2 + systemic corticosteroid

Patients at high risk of asthma related deaths

- Previous near-fatal asthma requiring intubation and mechanical ventilation
- Hospitalisation or emergency care visit for asthma in the past year.
- Currently using or have recently stopped using oral glucocorticosteroids
- Not currently using ICS

Metered dose inhalers

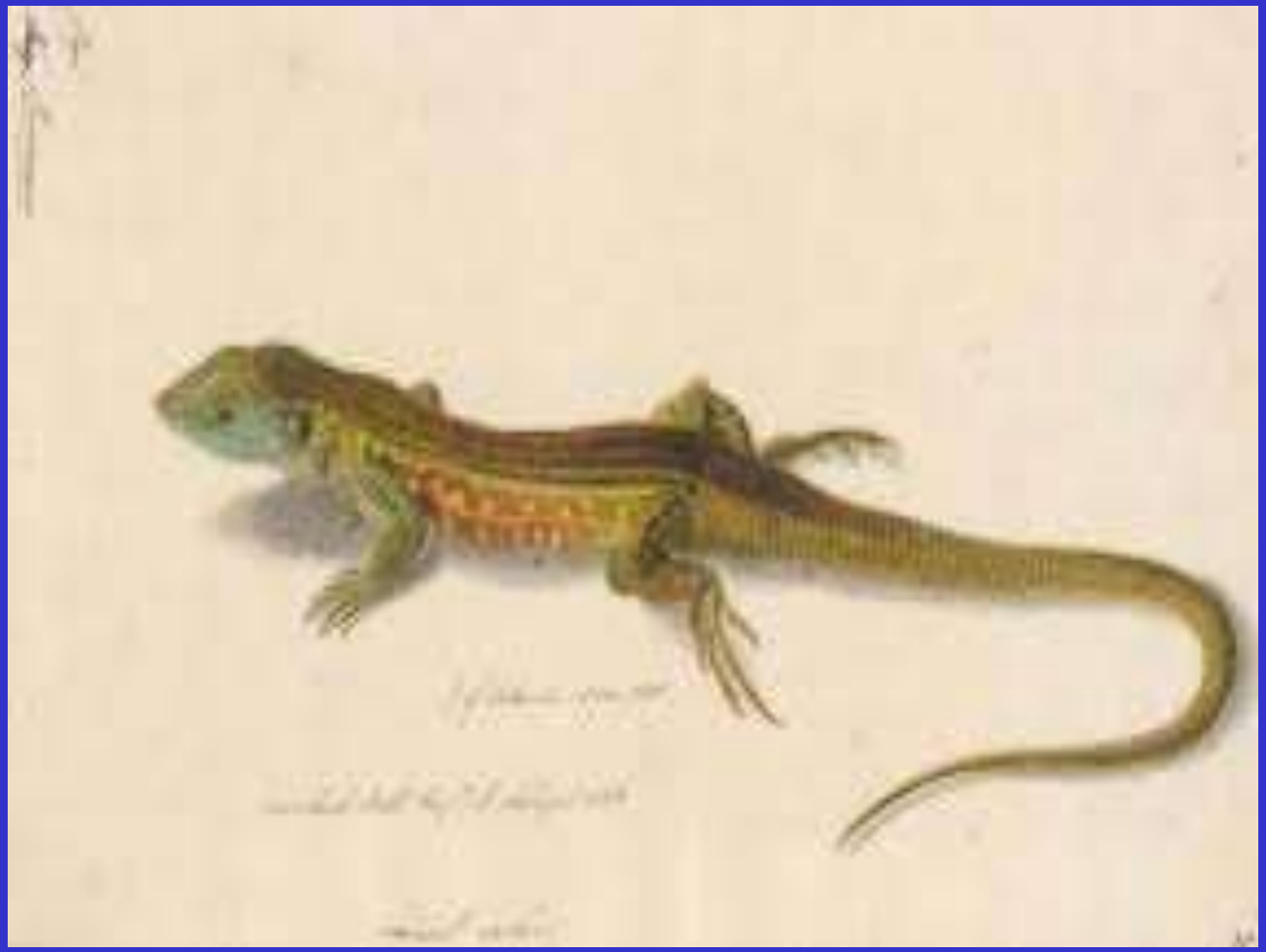
MDI is the best way to give asthma medications

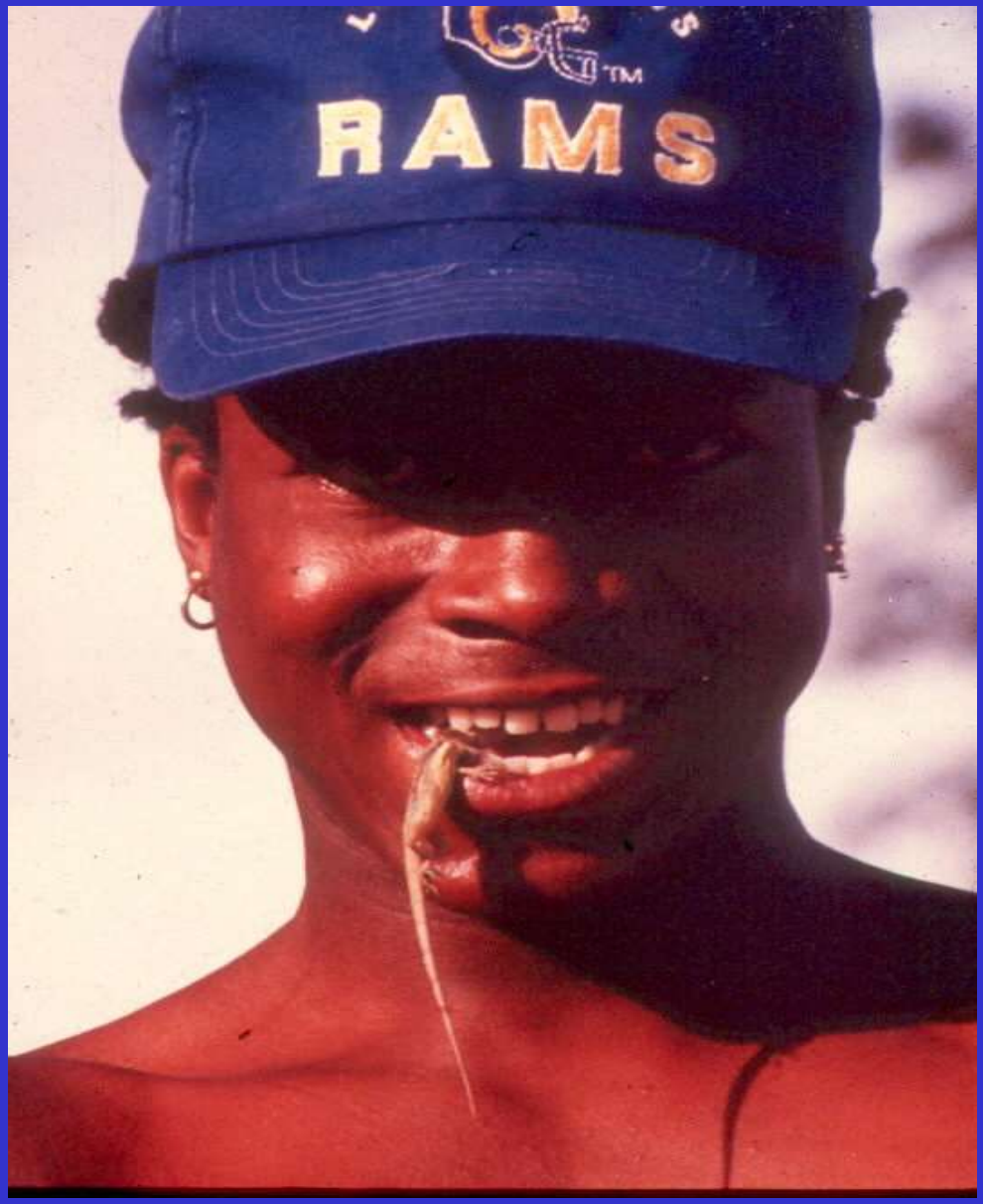
- Go **directly** to the airways in the lung where is acts
- Very **small doses** needed compared to oral administration
- Very **few side effects** because small amounts of the drugs are used and does not go to the rest of the body.

Inhaler technique

- Take off cap and shake
- Place the inhaler **3 fingers away** from the **open** mouth.
- **Breath out**
- **Press**
- **Inhale** with the mouth open.
- **Hold** breath for **10 seconds**.

Although asthma guidelines may not be perfect, they are the best vehicle we have to assist primary care physicians and patients to receive the best possible care for asthma




RAMS