

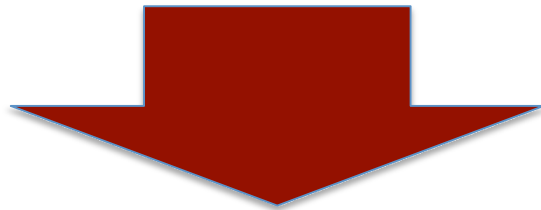
# **Update on the diagnosis and management of asthma in children in Indonesia**

*Dr. Rina Triasih, MMed(Paed, PhD, SpAK*

# Definition of asthma

## *(PNA 2015)*

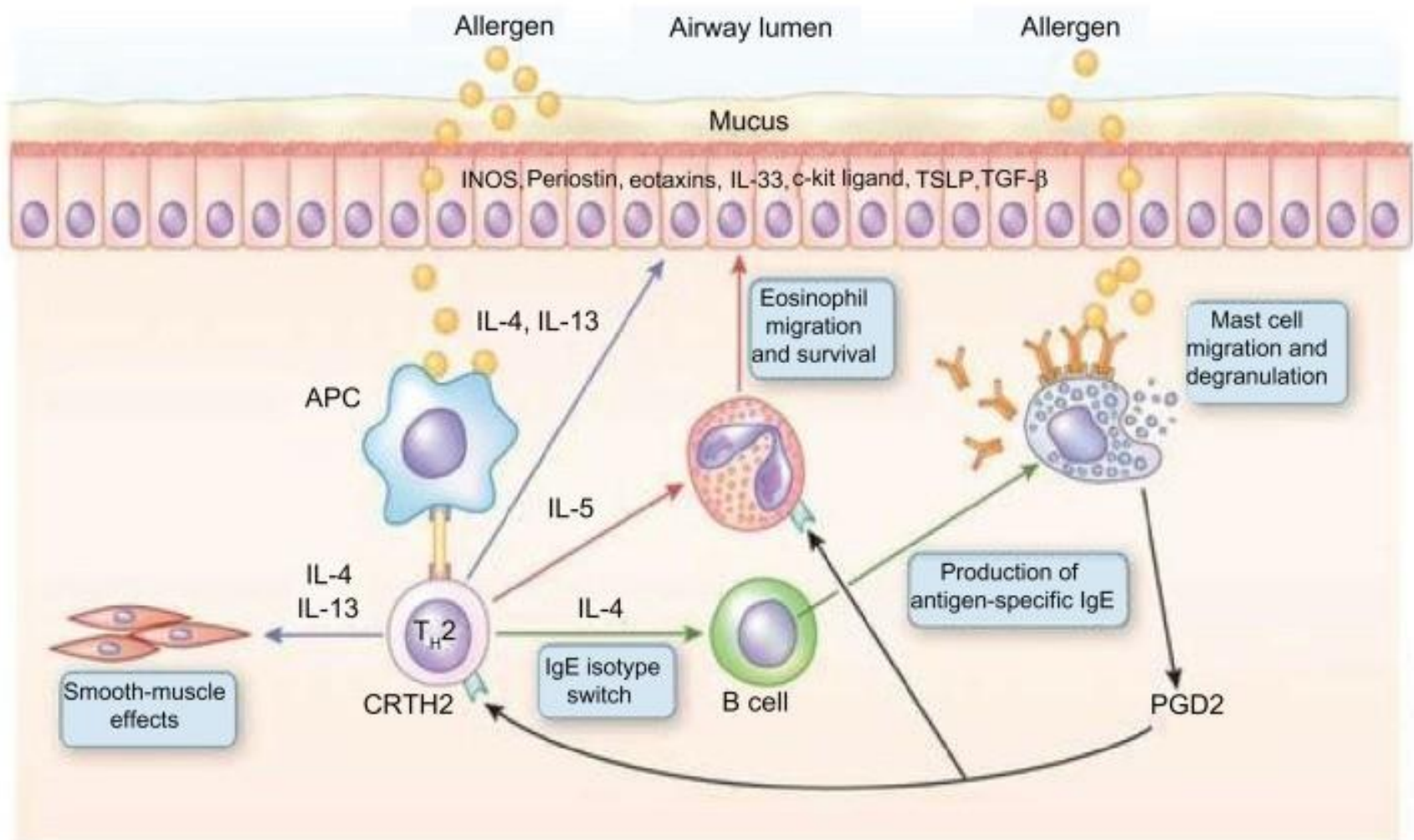
A disease of airway with underlying mechanism of **chronic airway inflammation**, which leads to various degree of **airway obstruction** and **hyperreactivity**

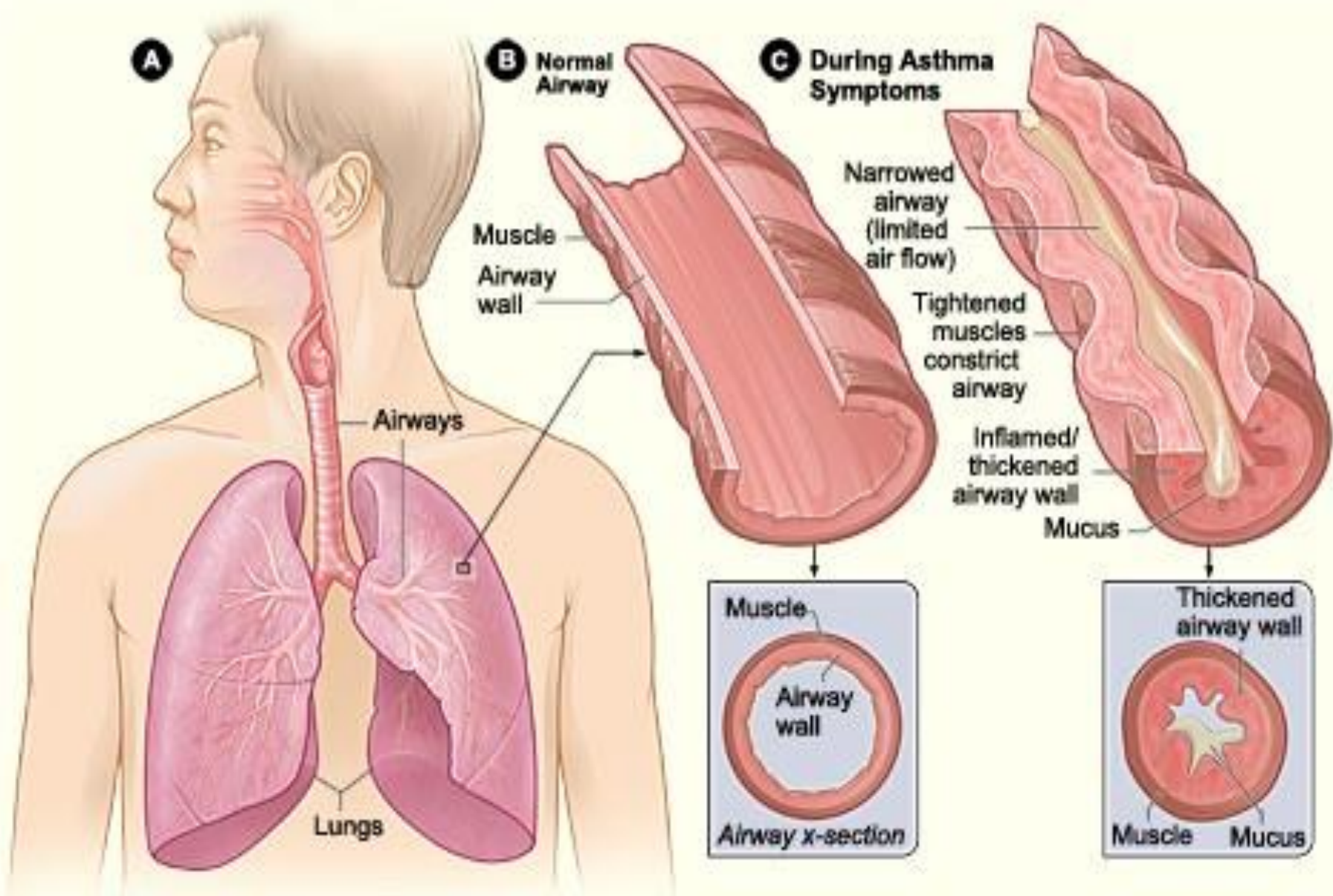


Symptoms: chronic and recurrent cough, wheeze, dyspnea, chest tightness

# Pathogenesis of asthma

The hallmark of asthma is chronic airway inflammation



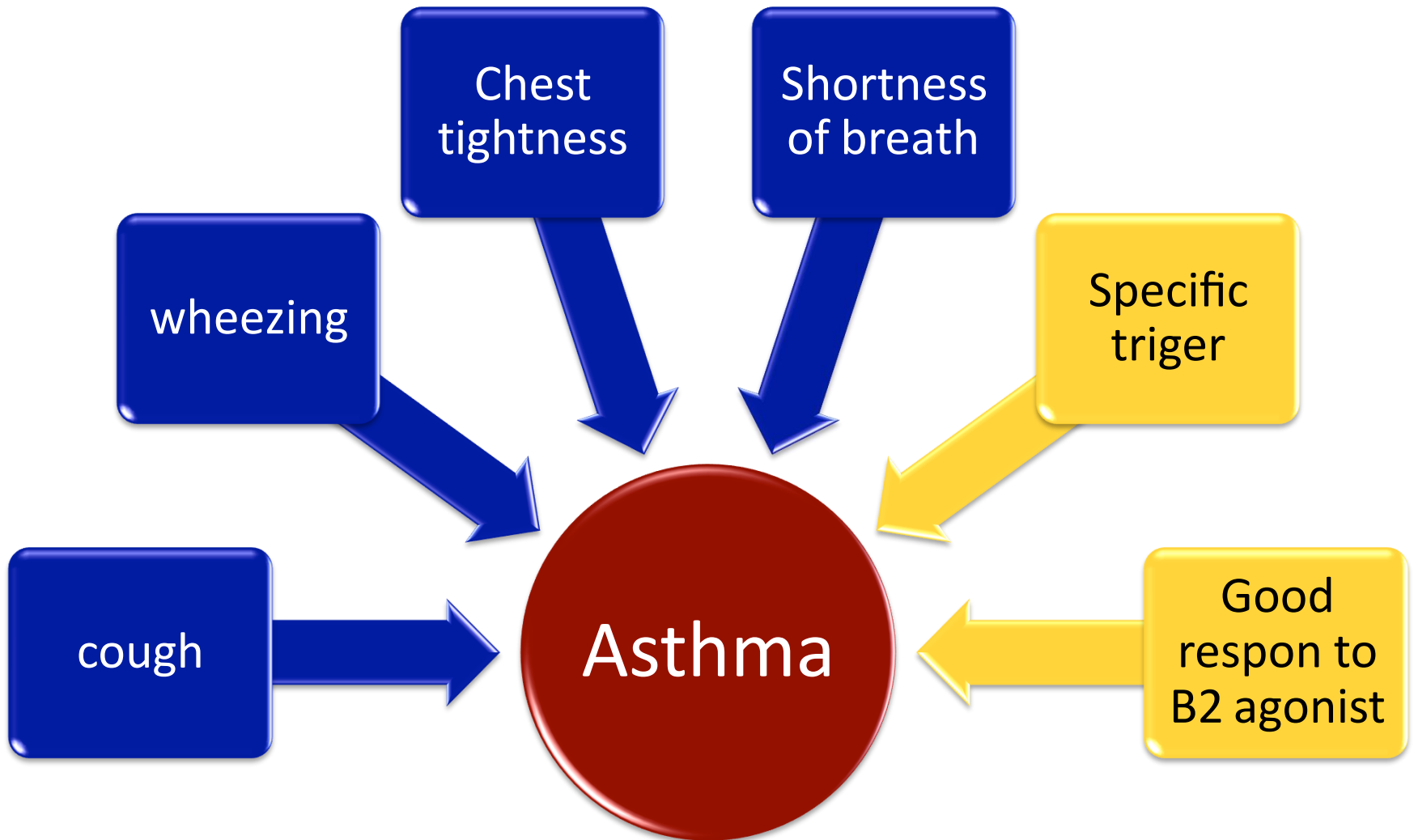
**A****B** Normal Airway**C** During Asthma Symptoms

# Diagnosis

Should be based on:

- A **history** of typical symptom patterns
- **Physical** findings
- Evidence of variable **airflow limitation**
  - bronchodilator reversibility testing
  - challenge test
  - SHOULD NOT ROUTINELY DONE: **CHEST X RAY**

# Asthma symptoms

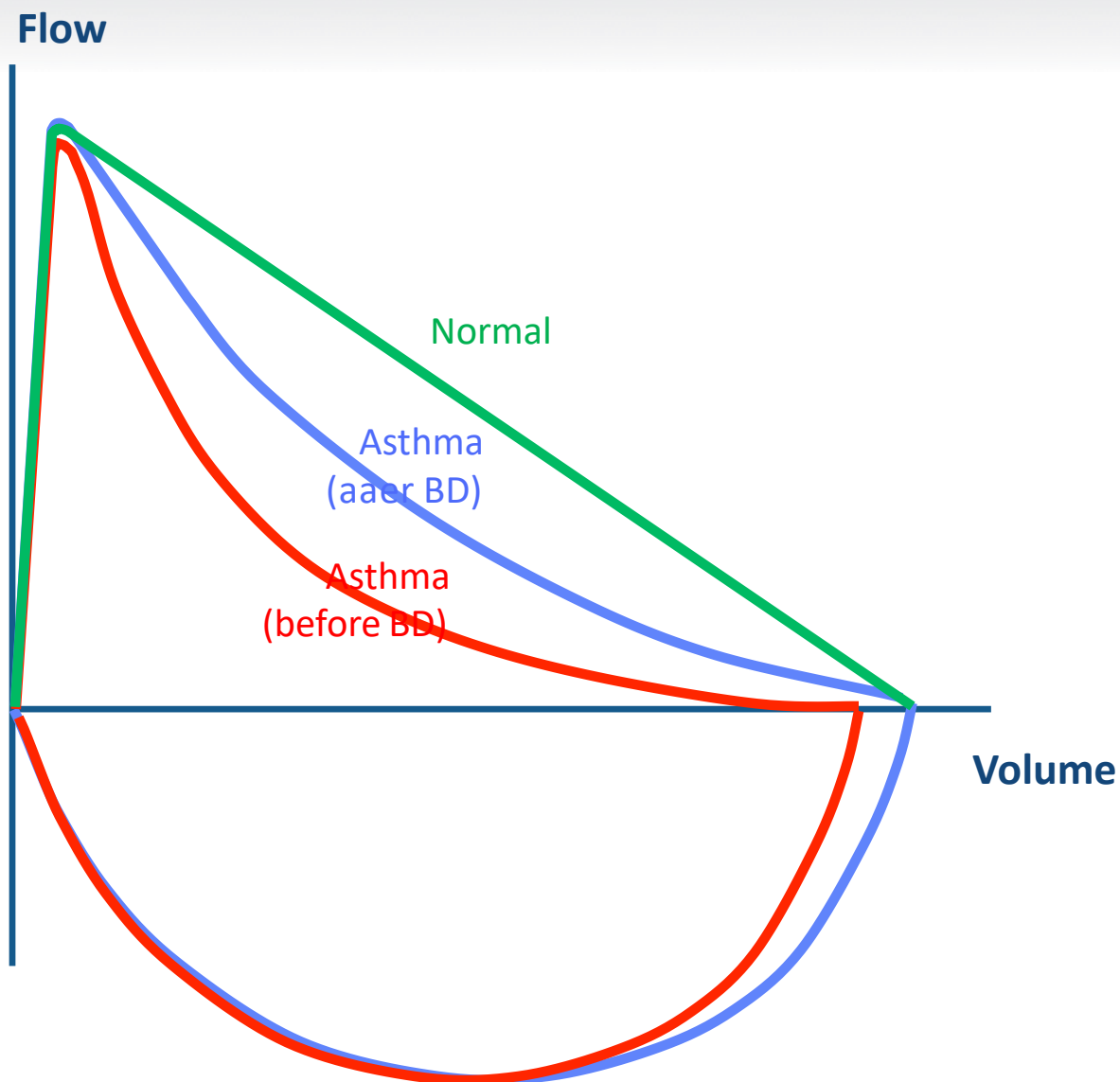


# Physical examination

- *Tachypnoea*
- *Prolonged Expiration*
- *Accessory muscles*
- *Recession*
- *Wheeze*
- *Hyperinflation*
- *Increase AP diameter*



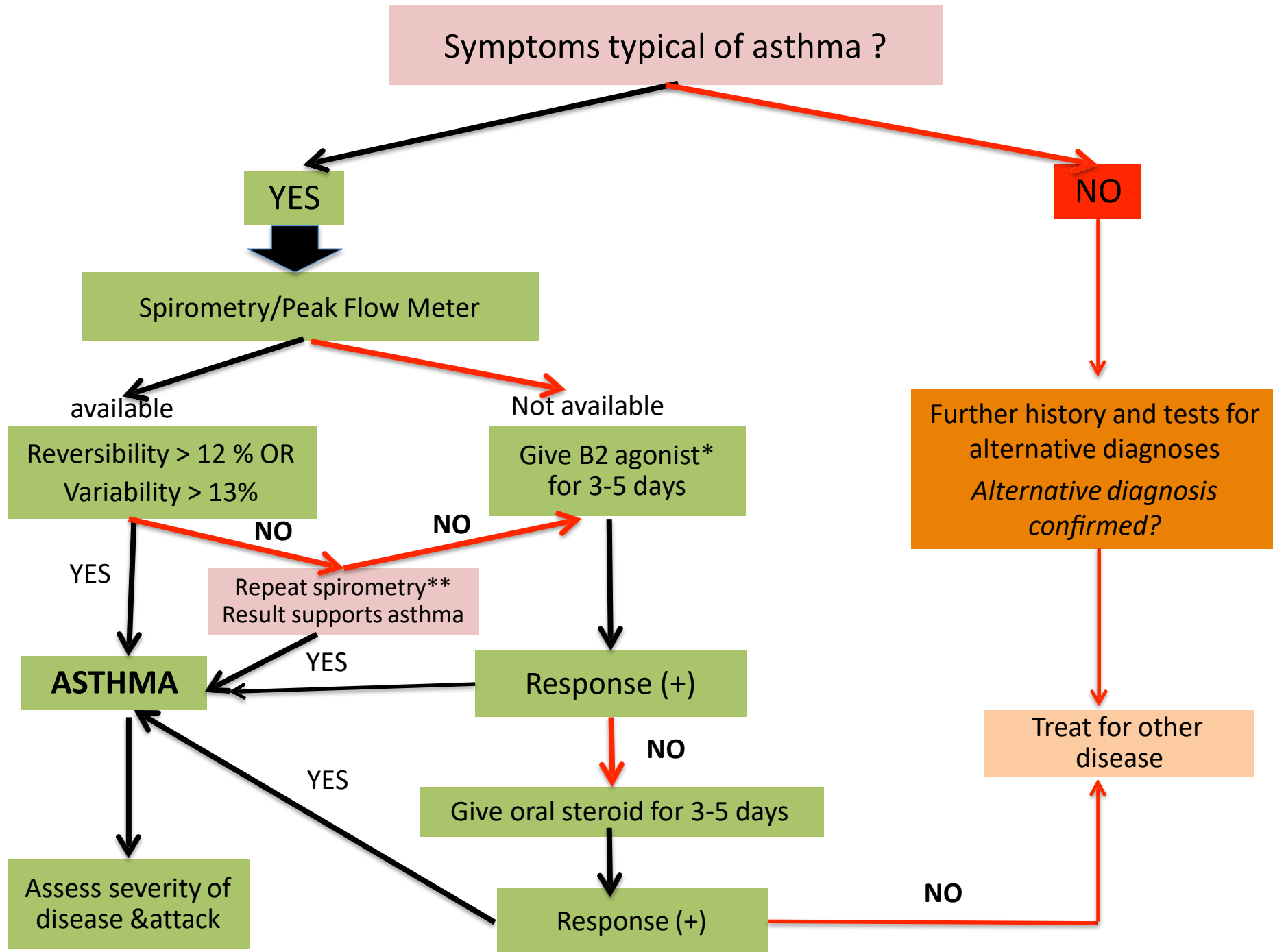
# Typical spirometric tracings







*Diagnostic approach of  
childhood asthma in Indonesia*



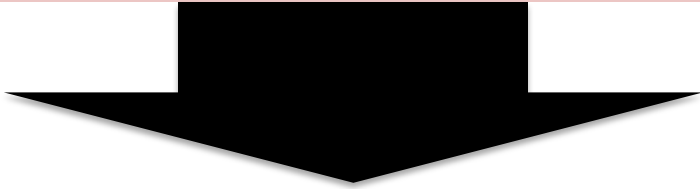
# “New” classification of asthma (severity)

	Frequency of symptom
<b>Intermittent</b>	<6x/year or $\geq 6$ weeks between symptoms
<b>Mild persistent</b>	>1x/month, $\leq 1$ x/week
<b>Moderate persistent</b>	>1x/week, but not everyday
<b>Severe persistent</b>	Almost everyday

1. Papadopoulos NG, Arakawa H, Carlsen KH, Custovic A, Gern J, Lemanske R et al. International consensus on (ICON) pediatric asthma. Allergy 2012.
4. Hamasaki Y, Kohno Y, Ebisawa M, Kondo N, Nishima S, Nishimuta T et al. Japanese Guideline for Childhood Asthma 2014. Allergol Inter 2014; 63:335-56.

# Level of asthma Control

Well controlled  
Partly controlled  
Uncontrolled



is used to evaluate the management and as a base for step up or step down of the therapy

1. Papadopoulos NG, Arakawa H, Carlsen KH, Custovic A, Gern J, Lemanske R et al. International consensus on (ICON) pediatric asthma. Allergy 2012.
2. The Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention 2014. Available from: [www.ginasthma.org](http://www.ginasthma.org)
4. Hamasaki Y, Kohno Y, Ebisawa M, Kondo N, Nishima S, Nishimuta T et al. Japanese Guideline for Childhood Asthma 2014. Allergol Inter 2014; 63:335-56.

# Assessment of symptom control

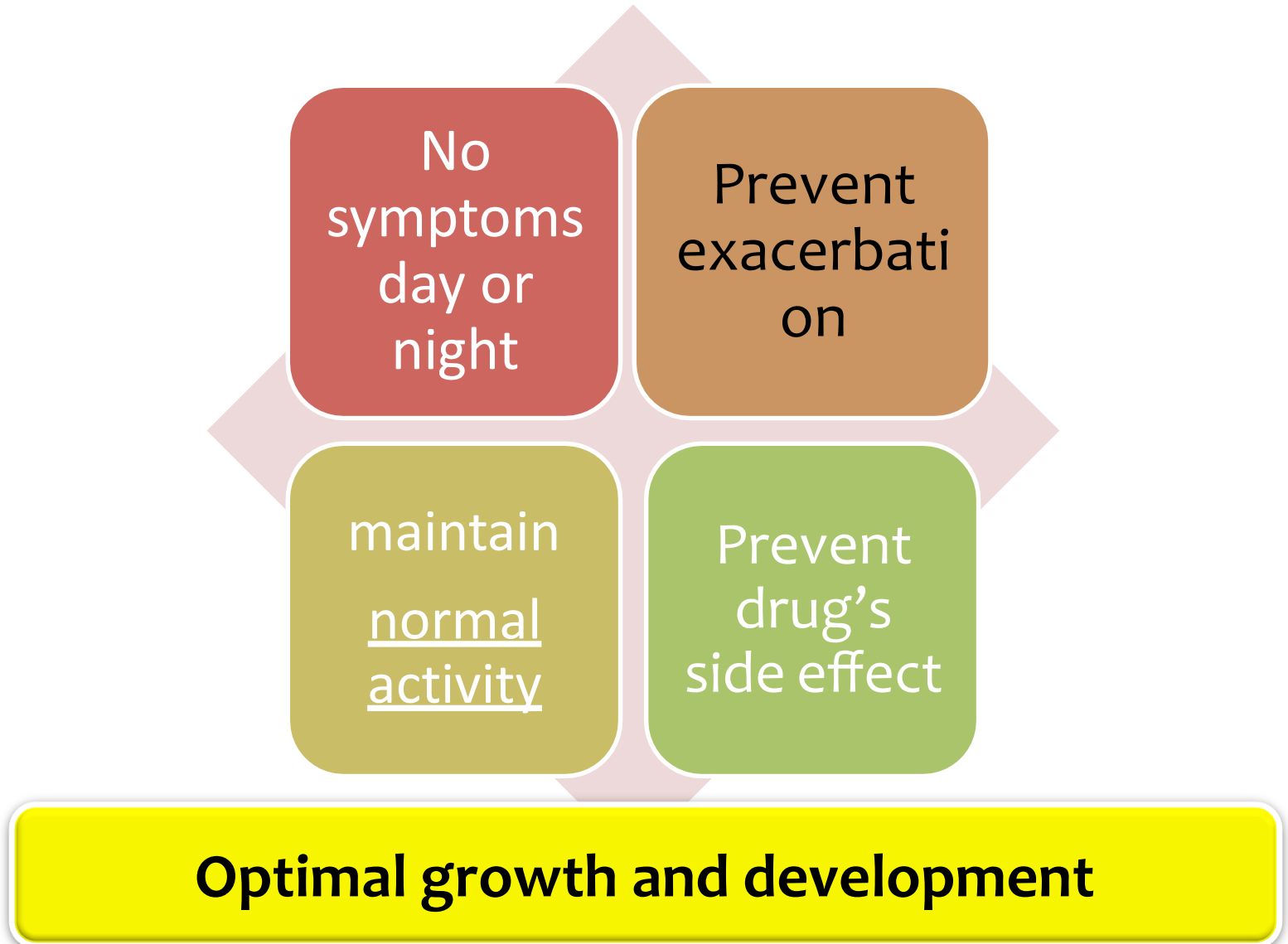
In the past 6 weeks	Well-controlled	Partially controlled (Min. one)	Uncontrolled
Daytime asthma symptoms	None ( $\leq 2$ x/week)	$> 2$ x/week	3-4 conditions of partly controlled
Activity limitation	None	Yes	
night waking	None	Yes	
Reliever needed	None ( $\leq 2$ x/week)	$> 2$ x/week	



# *Longterm management*



# Longterm treatment goals



# General principles of the management

1. Establish a patient-doctor partnership
2. Provide interventions:
  - non pharmacological: environmental management
  - pharmacological
3. Manage in a continuous cycle (control based asthma management)
4. Provide written action plan



# The management of asthma

1. Avoidance of trigger(s)

2. Avoidance of trigger(s)

3. Avoidance of trigger(s)

4. Drug(s)

a. Reliever

b. Controller

# TRIGGERS





# Asthma medication

## **Reliever drug (pereda)**

- To relieve asthma symptoms - attack
- As needed medication
- If the symptom relieve, stoped

## **Controller drug (pengendali)**

- To control asthma inflammation
- Long term medication, months - years
- Evaluated regularly,
- Dose adjusment: maintain, increase, decrease



## Six-Part Asthma Management Program

# Pharmacologic Therapy

---

### ■ Controllers

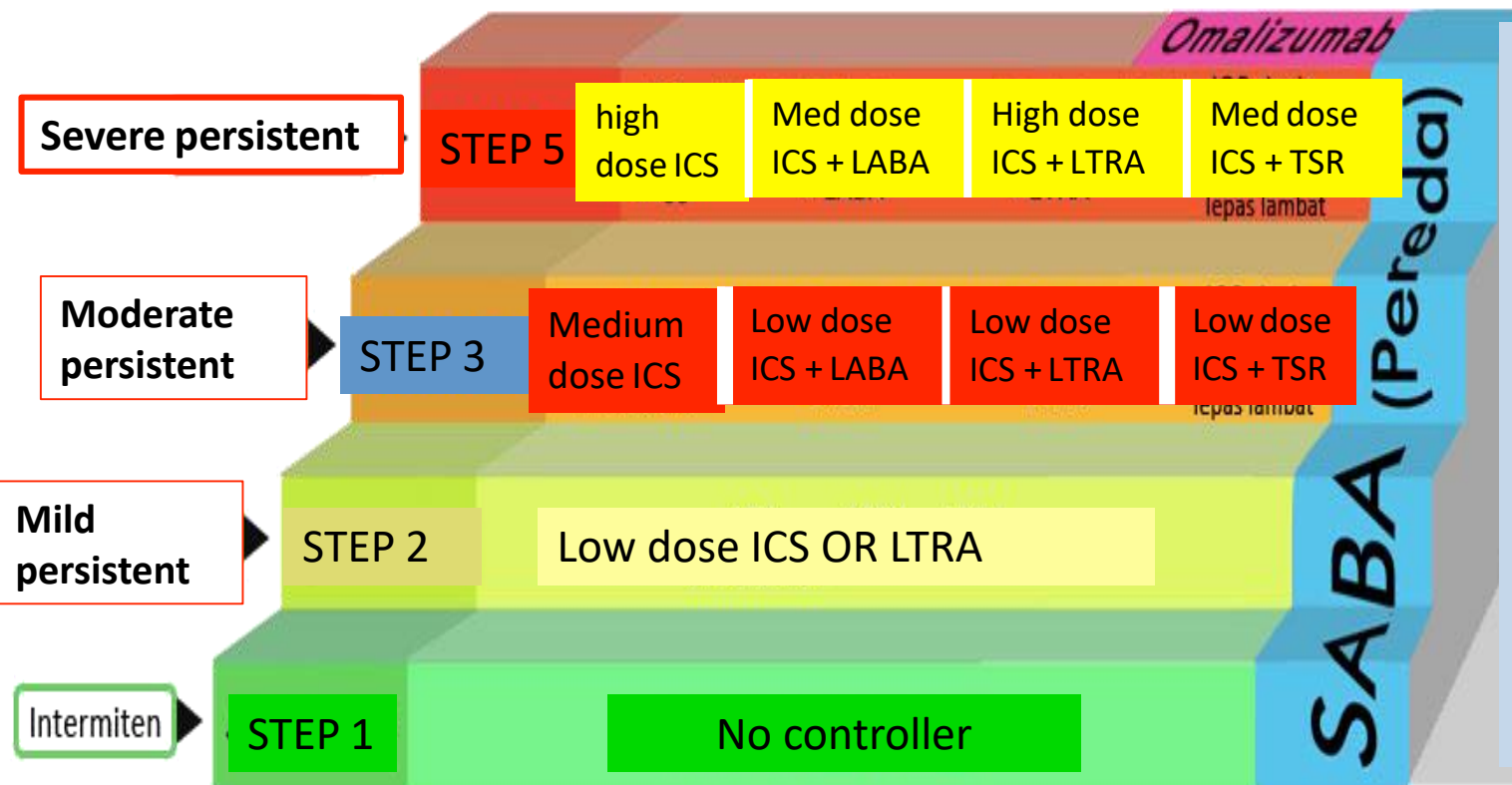
- Inhaled Corticosteroids
- Systemic Corticosteroids
- Sodium Cromoglycate
- Nedocromil Sodium
- Sustained-Release Theophylline
- Long Acting Beta<sub>2</sub>-Agonist

### ■ Relievers

- Short-Acting Inhaled Beta<sub>2</sub>-Agonists
- Systemic Corticosteroids
- Anticholinergics
- Short Acting Oral Beta<sub>2</sub>-Agonist
- Short Acting Theophylline



# Stepwise management



- Advise about non-pharmacological therapies and strategies
- Treat modifiable risk factors & comorbidities
- Provide guided self-management education

# Inhaled corticosteroid: How high can you go?



# Low, medium and high dose inhaled corticosteroids

## Adults and adolescents ( $\geq 12$ years)

Inhaled corticosteroid	Total daily dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (CFC)	200–500	>500–1000	>1000
Beclometasone dipropionate (HFA)	100–200	>200–400	>400
Budesonide (DPI)	200–400	>400–800	>800
Ciclesonide (HFA)	80–160	>160–320	>320
Fluticasone propionate (DPI or HFA)	100–250	>250–500	>500
Mometasone furoate	110–220	>220–440	>440
Triamcinolone acetonide	400–1000	>1000–2000	>2000

- This is not a table of equivalence, but of estimated clinical comparability
- Most of the clinical benefit from ICS is seen at low doses
- High doses are arbitrary, but for most ICS are those that, with prolonged use, are associated with increased risk of systemic side-effects

# Low, medium & high dose inhaled corticosteroids

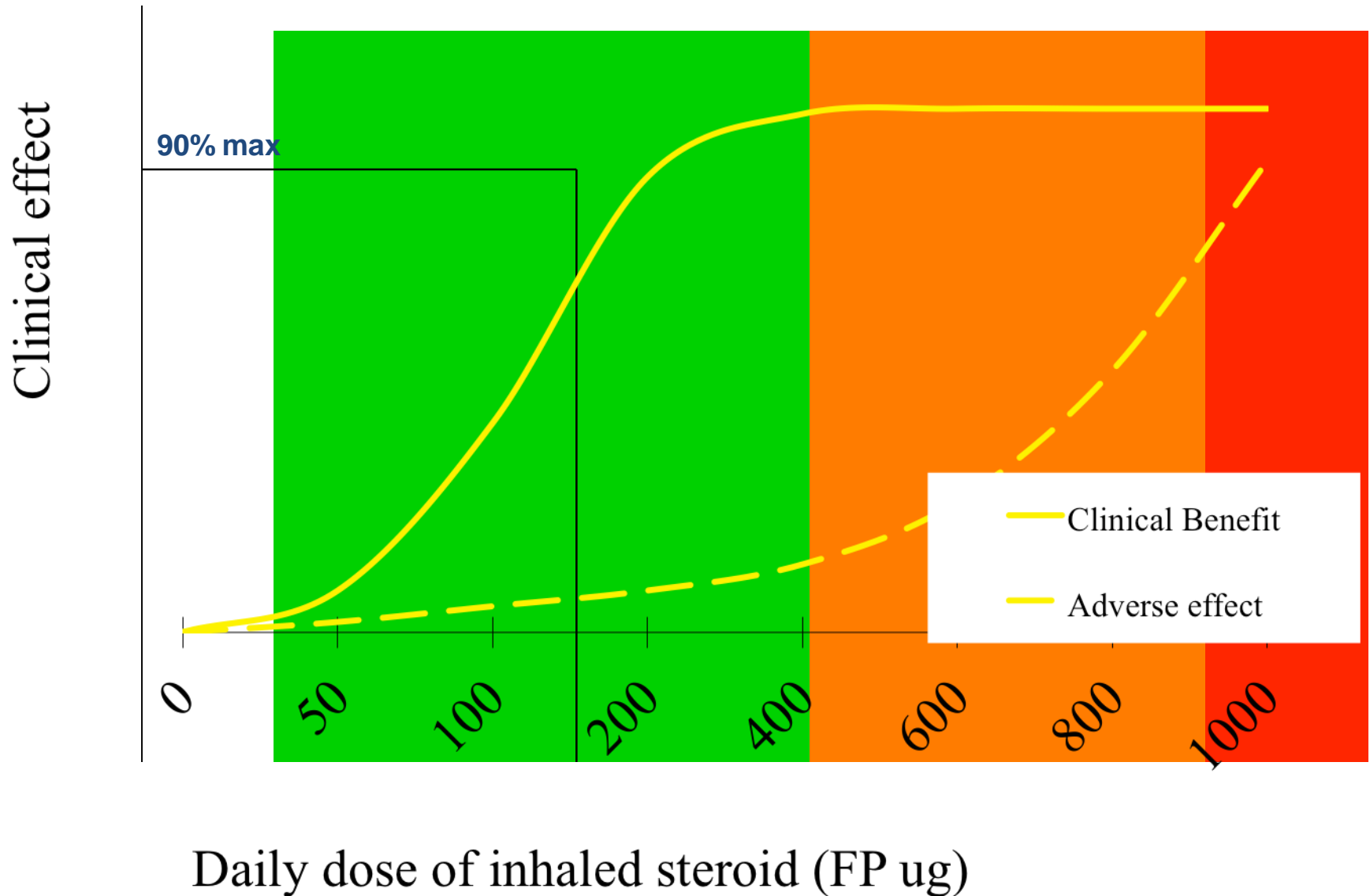
## Children 6–11 years

Inhaled corticosteroid	Total daily dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (CFC)	100–200	>200–400	>400
Beclometasone dipropionate (HFA)	50–100	>100–200	>200
Budesonide (DPI)	100–200	>200–400	>400
Budesonide (nebulers)	250–500	>500–1000	>1000
Ciclesonide (HFA)	80	>80–160	>160
Fluticasone propionate (DPI)	100–200	>200–400	>400
Fluticasone propionate (HFA)	100–200	>200–500	>500
Mometasone furoate	110	≥220–<440	≥440
Triamcinolone acetonide	400–800	>800–1200	>1200

- This is not a table of equivalence, but of estimated clinical comparability
- Most of the clinical benefit from ICS is seen at low doses
- High doses are arbitrary, but for most ICS are those that, with prolonged use, are associated with increased risk of systemic side-effects



# Dose - response curve for inhaled corticosteroids



# Inhalation therapy in asthma

The **first choice** of delivery mode in the management of asthma, both for reliever and controller



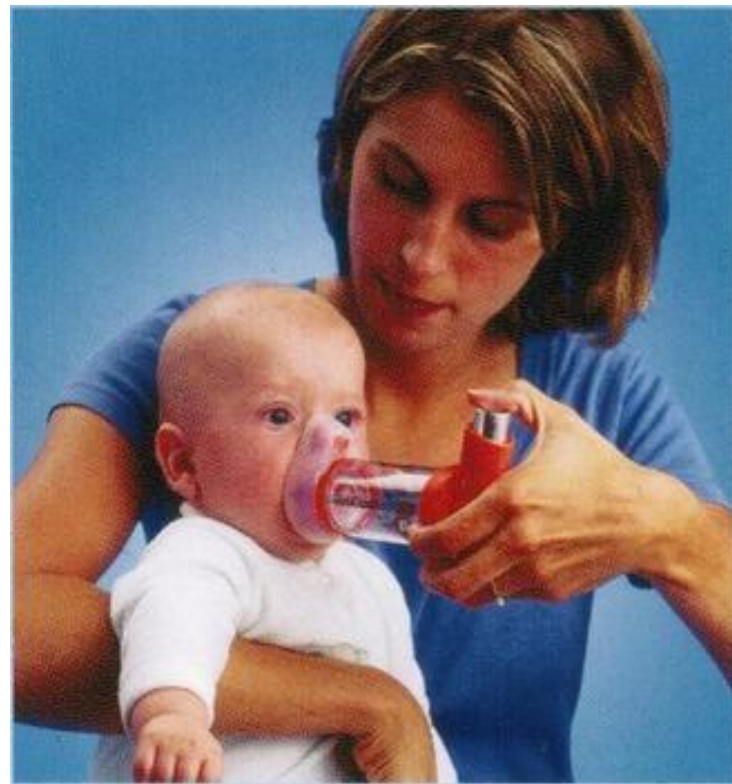
# Choosing inhaler devices for children with asthma

Age Group	Preferred Device	Alternate Device
Younger than 4 years	Pressurized metered-dose inhaler <i>plus</i> dedicated spacer with face mask	Nebulizer with face mask
4 – 6 years	Pressurized metered-dose inhaler <i>plus</i> dedicated spacer with mouthpiece	Nebulizer with mouthpiece
Older than 6 years	Dry powder inhaler, or breath-actuated pressurized metered-dose inhaler, or pressurized metered-dose inhaler with spacer and mouthpiece	Nebulizer with mouthpiece

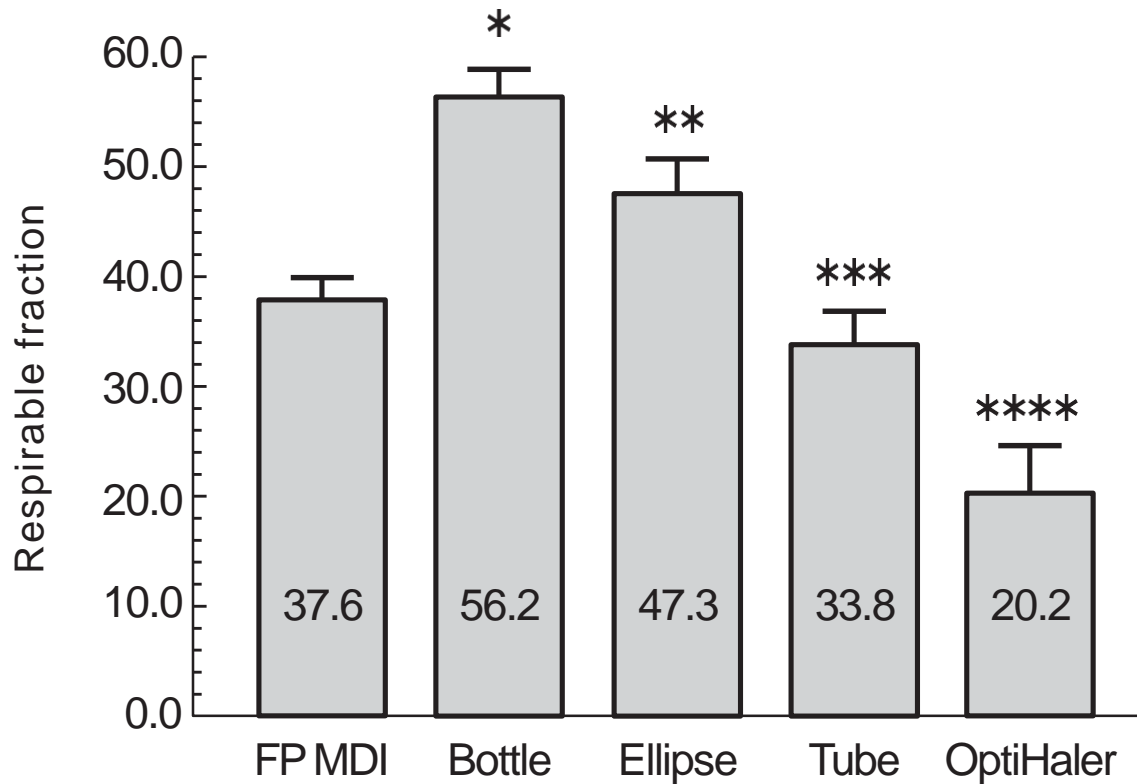
# Nebulizer versus holding chamber



=



# Boale spacer



Zar HJ, et al. *Pediatr Allergy Immunol* 2002;13:217-22.

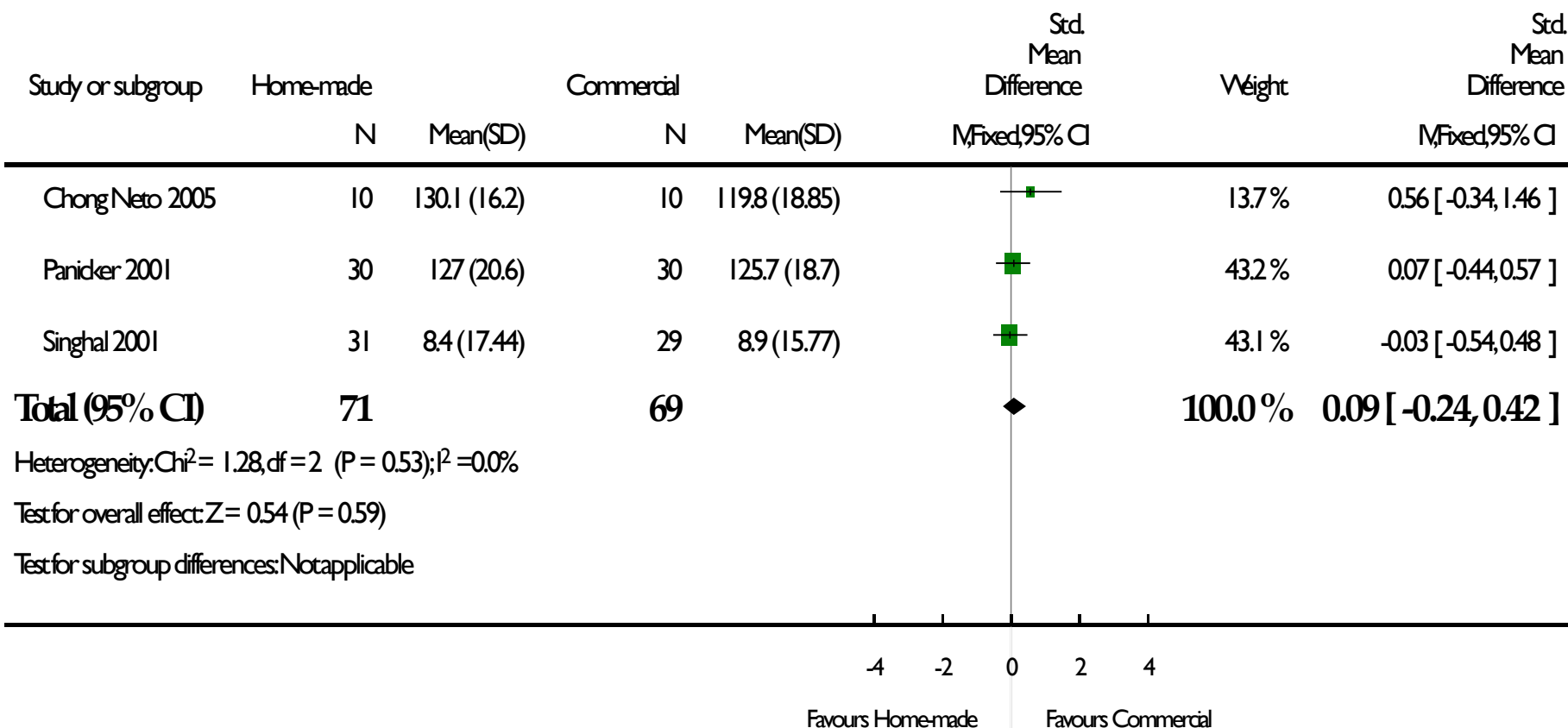
Zar HJ, et al. *Arch Dis Child* 2007;92:142-6.

Asmus MJ, et al. *Am J Respir Crit Care Med* 2001; 163: A444

# Commercial versus home-made spacers in delivering bronchodilator therapy for acute therapy in children



Outcome: 5 Heart rate per minute (HR)



# Clinical effectiveness and safety of montelukast in asthma. What are the conclusions from clinical

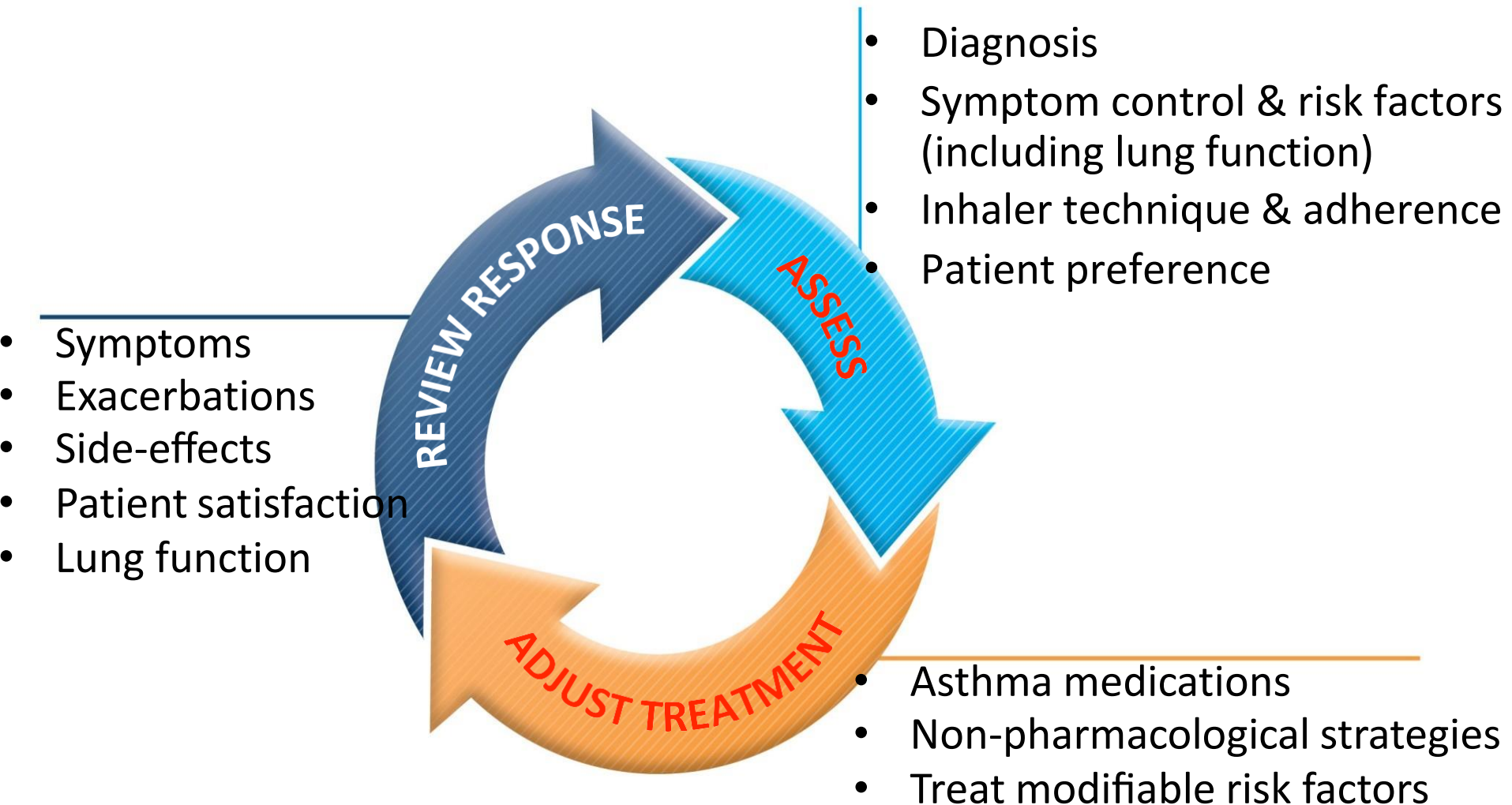
Montelukast has a place in:

- the treatment of young children with viral-triggered wheezing diseases or exercise-induced asthma
- children whose parents are steroid-phobic and find ICS unacceptable.

Andrew Bush\*



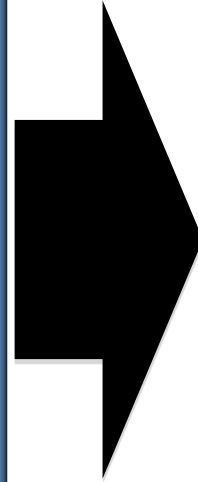
# The control-based asthma management cycle





# How often should asthma be reviewed ?

- First time after controller started: 2 wks – 1 mo
- Then every 1-3 months  
→ then every 3-12 mo
- After an exacerbation: within 1 week



- Symptoms
- Exacerbations
- Side-effects
- Patient satisfaction
- Lung function

Omalizumab or oral corticosteroid

2-3 months

High dose  
ICS

Mod dose ICS  
+ LABA

High dose ICS  
+ LTRA

Mod dose ICS  
+ TSR

2-3 months

Mod dose  
ICS

Low dose ICS  
+ LABA

Low dose ICS  
+ LTRA

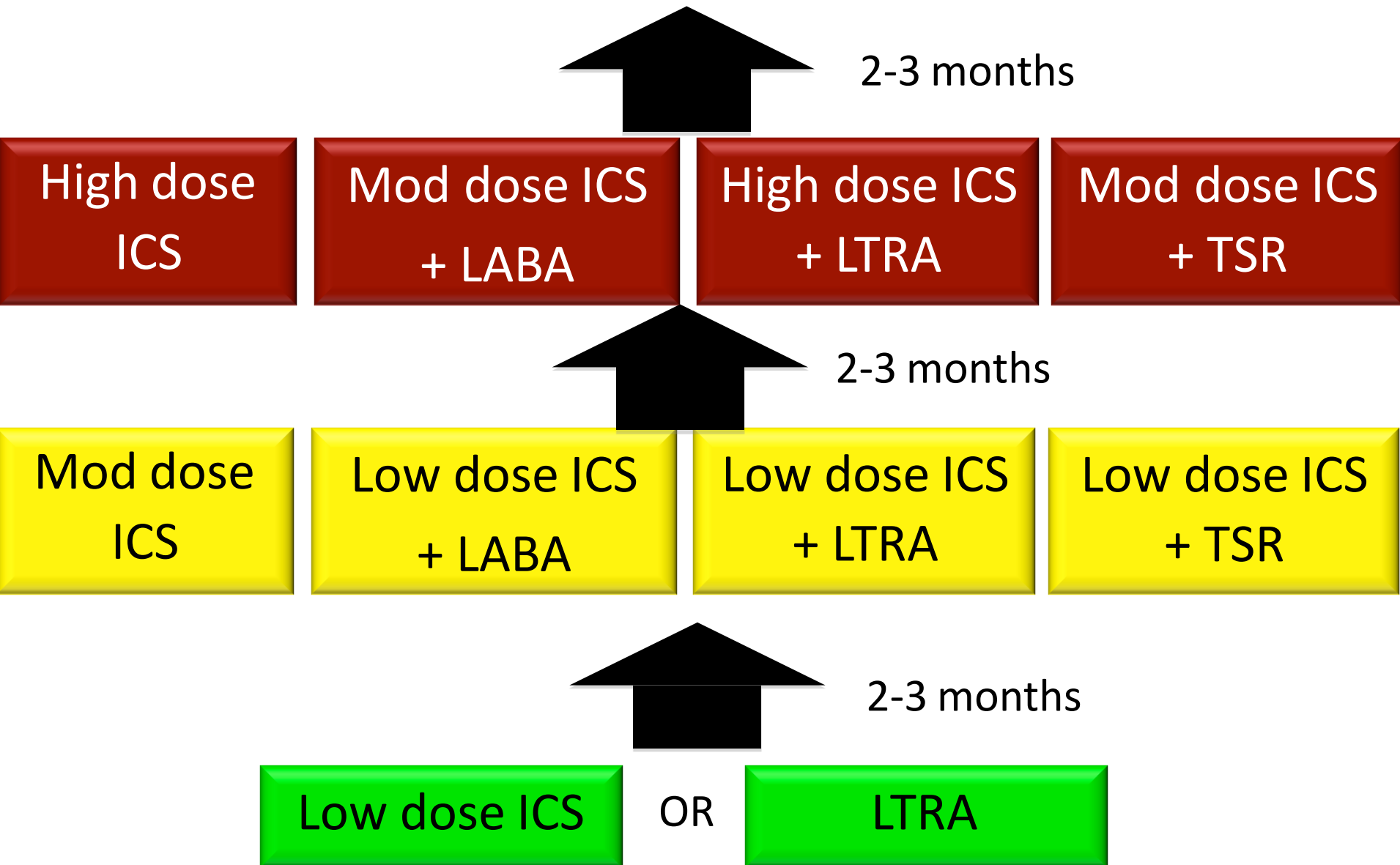
Low dose ICS  
+ TSR

2-3 months

Low dose ICS

OR

LTRA



High dose ICS

Mod dose ICS  
+ LABA

≥ 3 months

Reduce ICS dose by 50% and continue second controller

Moderate dose ICS

Low dose ICS + LABA

≥ 3 months

Reduce ICS dose by 50%

Reduce ICS/LABA to once daily

Low dose ICS

Once daily ICS/LABA

≥ 3 months

Once daily dosing

STOP only if: no symptoms  
for 6–12 months, and  
patient has no risk factors

# When it doesn't seem right!

( inadequate response to appropriate dose of ICS )

- Poor adherence
- Poor inhaler technique
- Comorbidities
- Ongoing exposure to allergen
- Incorrect diagnosis



*Thank you*