

# Management of chronic Childhood asthma



# Introduction

- Asthma is the most common chronic condition of childhood.
- The prevalence and severity of childhood asthma has increased substantially in recent years.
- It is one of the leading causes for ER visits for children.
- It is one of the leading causes for missed school days for children.
- It is also a cause for considerable morbidity, disability and occasional mortality all ages.



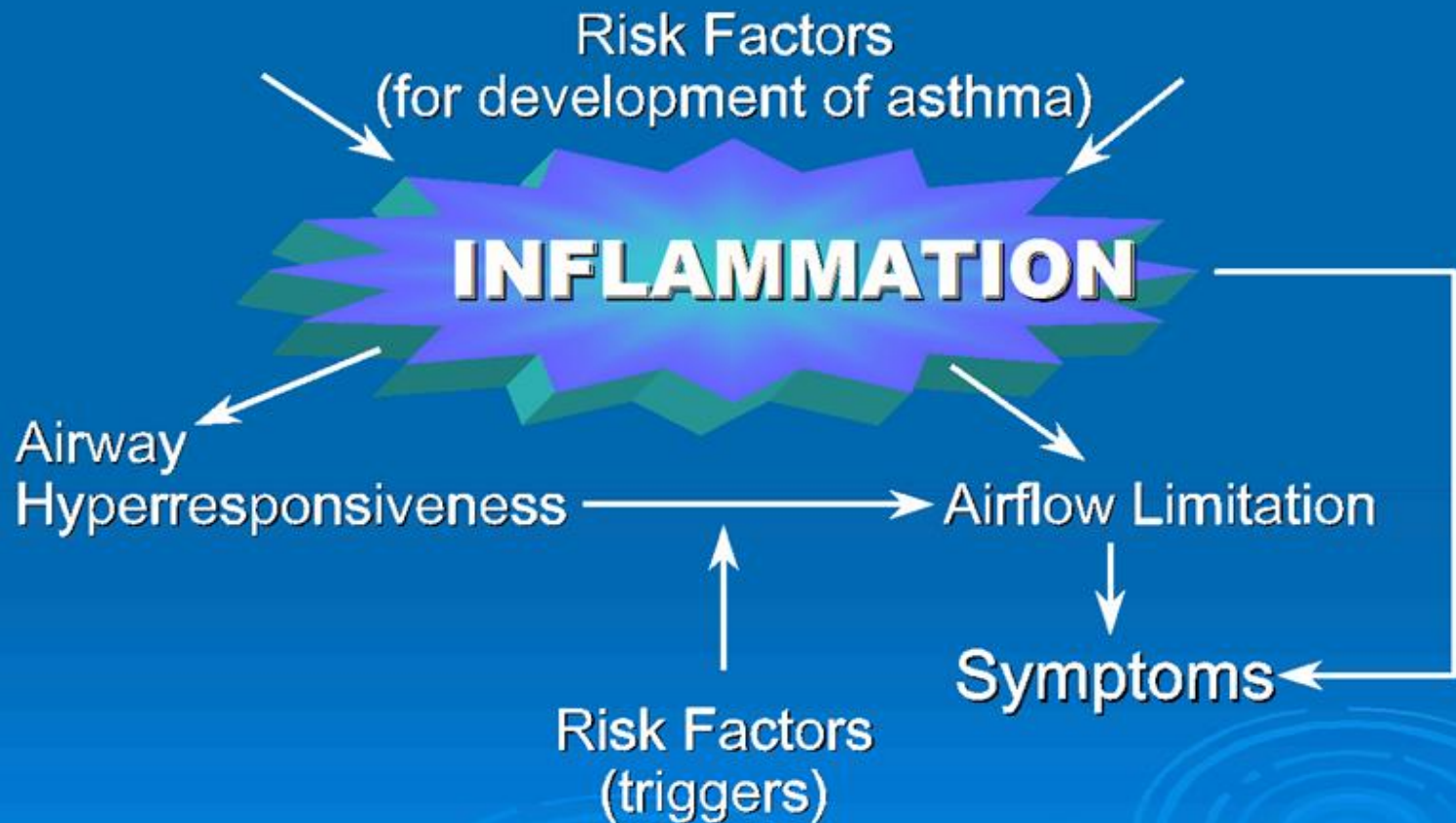
# Definition

- **Asthma is a diffuse obstructive lung disease which occurs due to inflammation of the airways causing :**
  - Increased mucus production
  - contraction of the bronchial smooth muscles
  - hyperactivity of the airways





# Mechanisms Underlying the Definition of Asthma



# Clinical diagnosis

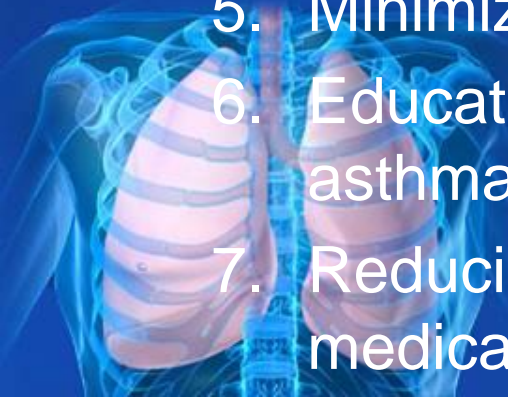
- Bronchial asthma is suspected in any child with a chronic persistent or recurrent wheeze which responds to bronchodilators.
- > 5yrs (PEFM, Spirometry)
  - PEF (20%)
  - FEV<sub>1</sub> (>15%)
- < 5yrs it can be extremely difficult to diagnose as only 40% of children who wheeze before the age of 6 yrs develop asthma.



# Management

## *The goals of chronic asthma treatment are :-*

1. Relief of chronic symptoms during the day and the night.
2. Prevention of an acute exacerbation and the need for urgent medical intervention.
3. Optimization of lung function.
4. Normalization of daily activities.
5. Minimizing the use of reliever medications.
6. Education of both the child and parents about asthma
7. Reducing or eliminating any side effect from medications.





**Principles** A comprehensive therapeutic approach is required to meet the above objectives.

**This includes the following:**

- Early diagnosis and objective assessment of severity.
- Control of the environment to exclude cigarette smoke and reduce exposure to triggers such as viral infection and allergens.
- Optimal use of medications to limit side effects and cost, using the most appropriate delivery system.
- Follow-up and regular re-evaluation (clinical evaluation and quality of life).
- Patient and parent education.

Optimal management of asthma includes ***avoidance of triggers / environmental control, pharmacotherapy and education .***

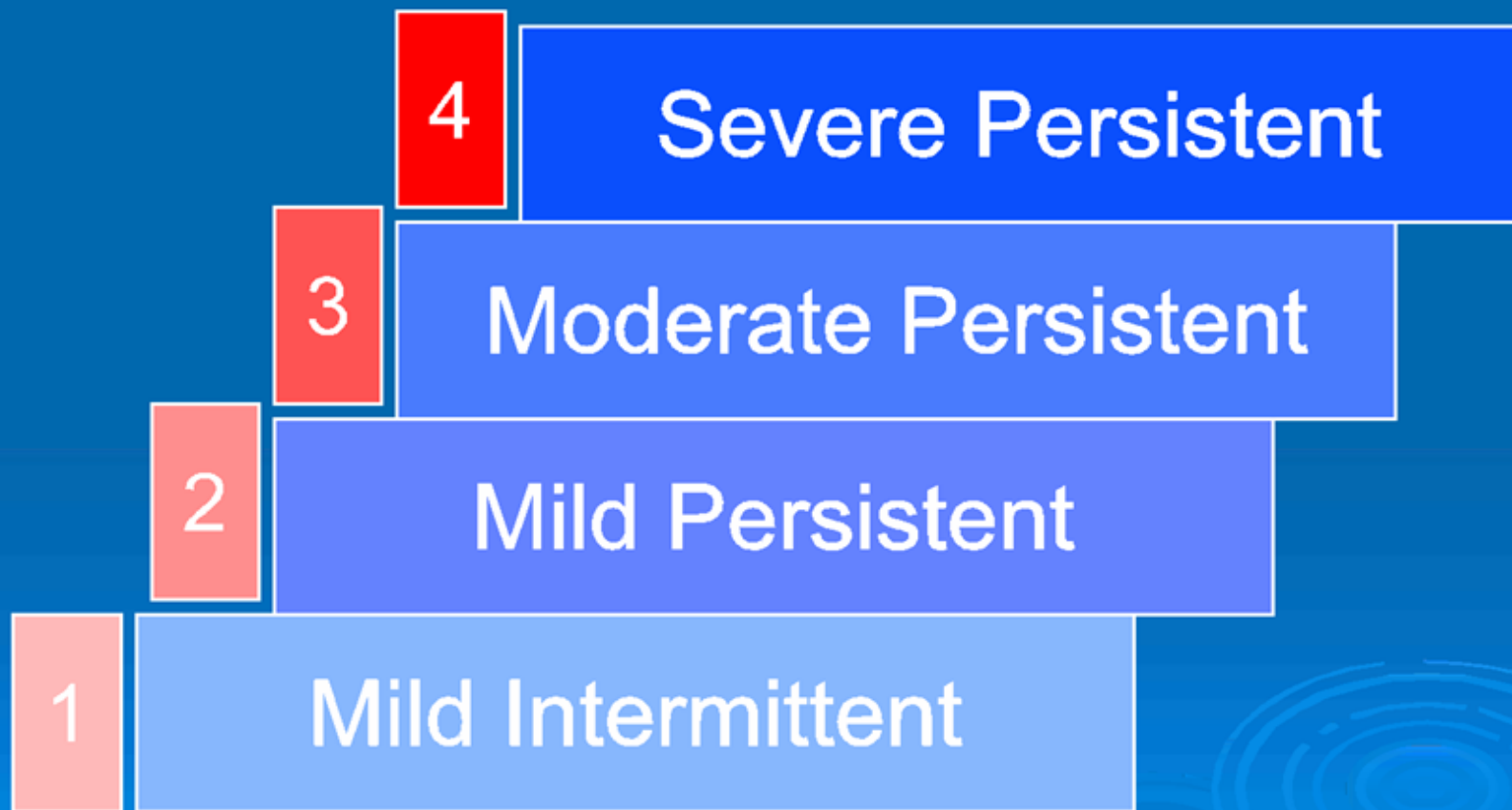


- Co-morbid conditions:
  - Sinusitis
  - Rhinitis
  - GERD 64%
- These worsen the disease severity
- Effective management of these conditions will improve the asthma symptoms, less medication will be required.





# Classifying Asthma Severity



*Severity is classified before therapy begins.*

# CLASSIFICATION OF ASTHMA

- *Asthma is highly variable, it can be intermittent, mild persistent, moderate persistent or severe persistent,*
- Intermittent (Step I):
  - Intermittent symptoms  $\leq$  once \ week;
  - Night time asthma symptoms  $\leq$  twice \ month;
  - Asymptomatic between exacerbation,
  - PEF or FEV1  $>80\%$  predicted,
  - Variability  $\leq 20\%$ .

# CLASSIFICATION OF ASTHMA

## ■ Mild persistent (Step II):

- Symptoms  $> 1$  time a week but less than 1 time \ day;
- Nighttime asthma  $> 2$  times a month,
- PEF or FEV1  $> 80$  predicted,
- Variability 20-30%.



# CLASSIFICATION OF ASTHMA

## ■ Moderate persistent (Step III):

- Symptoms daily,
- Frequent night asthma symptoms;
- Limitation of physical activity by asthma;
- PEF or FEV1  $> 60 < 80\%$  predicted;
- Variability  $> 30\%$ .

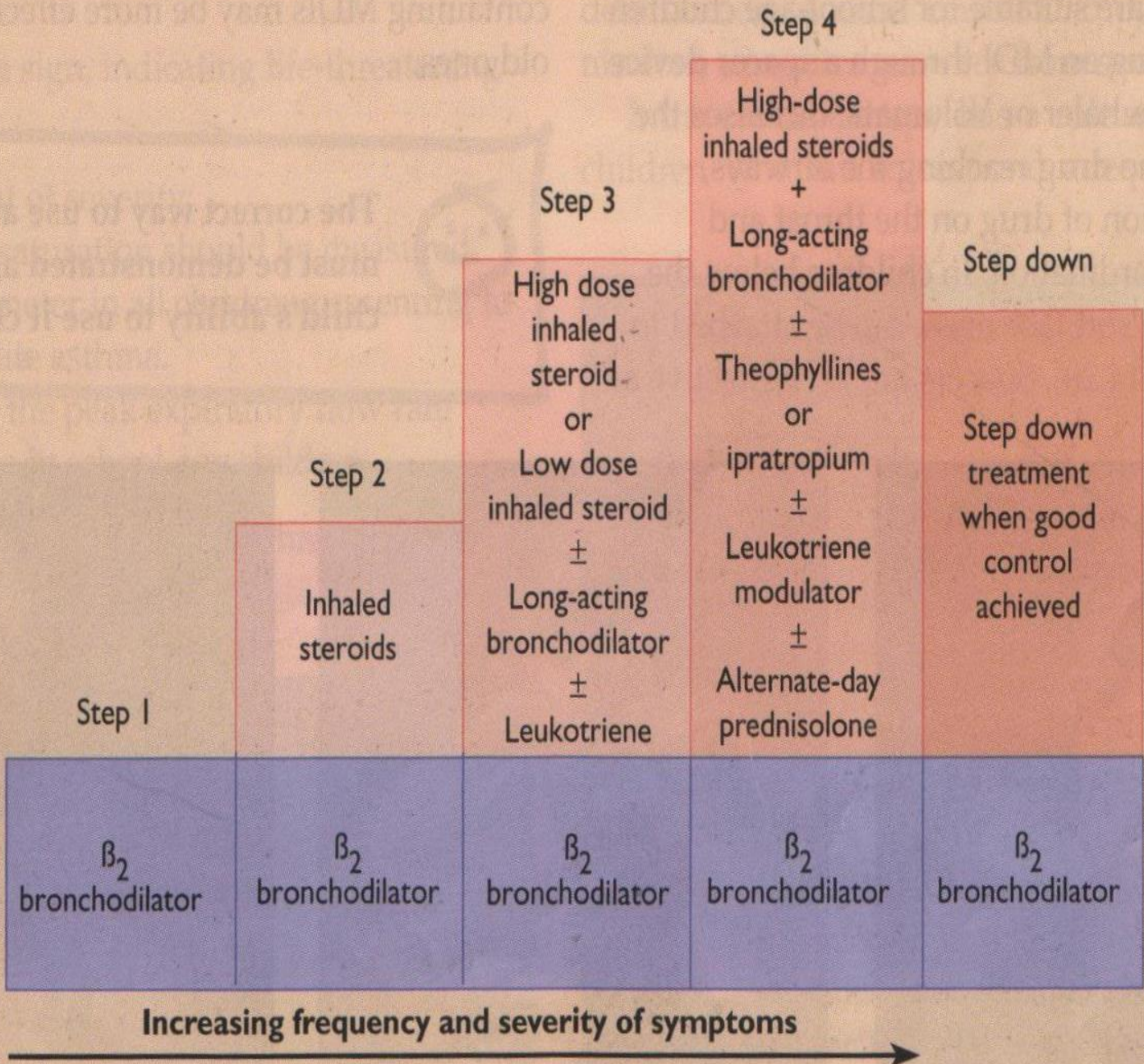
## ■ Severe persistent (Step IV):

- Continuous symptoms,
- Frequent night asthma symptoms,
- Limitation of physical activity by asthma,
- PEF or FEV1  $\leq 60\%$  predicted,
- Variability  $> 30\%$ ,

# Inhaled versus oral

	<b>inhaled</b>	<b>oral</b>
<b>Dose</b>	<b>low</b>	<b>high</b>
<b>Speed of onset</b>	<b>rapid</b>	<b>slow</b>
<b>Side effect</b>	<b>rare</b>	<b>common</b>
<b>Administration</b>	<b>Requires instruction</b>	<b>easy</b>
<b>Site of action</b>	<b>local</b>	<b>systemic</b>
<b>Prevention of Exercise induced asthma</b>	<b>good</b>	<b>poor</b>

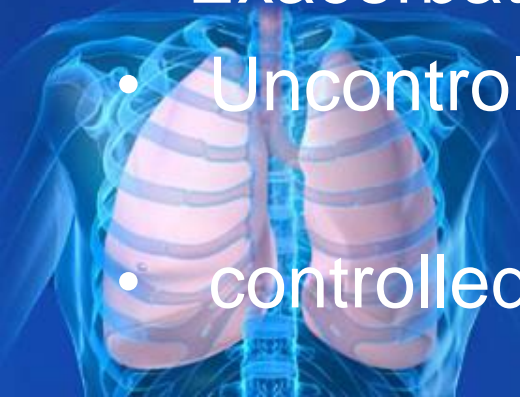
# b) A stepwise approach to the treatment of chronic asthma





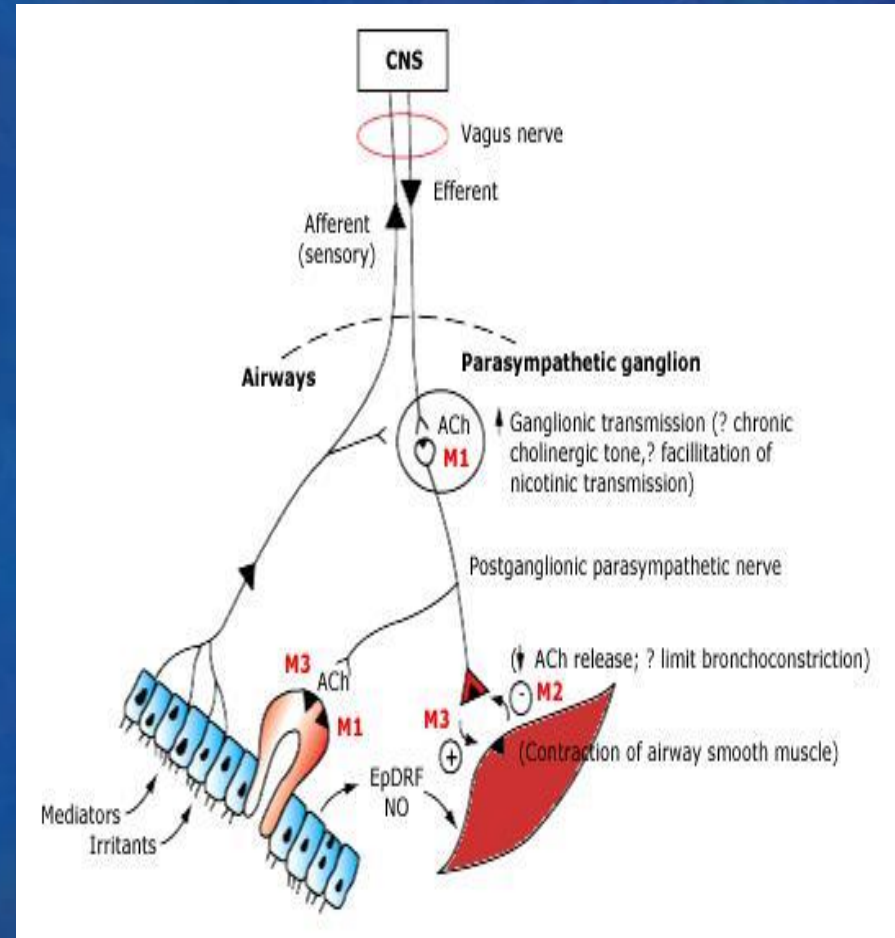
# Level of asthma control

- Partly controlled
- Daytime symptoms →  $>2$  / week
- Any limitation of activity / w
- Any nocturnal symptoms / w
- Rescue treatment →  $>2$  / week
- Lung functions  $< 80\%$  of personal best
- Exacerbations →  $>1/y$
- Uncontrolled → 3 or more of the above or  
Exacerbations →  $>1/w$
- controlled → Non



# Pharmacotherapy

- **Relief medications :-**
  - Short acting beta 2 agonist
  - Anticholinergic
    - Atropine
    - Ipratropium bromide (atrovent)
- **Preventive medications:-**
  - Inhaled corticosteroids
  - Sodium cromoglycate

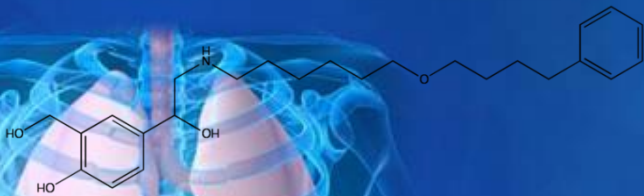


## Control medications:-

- Long acting B<sub>2</sub> agonists
- Anteleukotriene
- Slow release xanthenes (SR theophyllines)

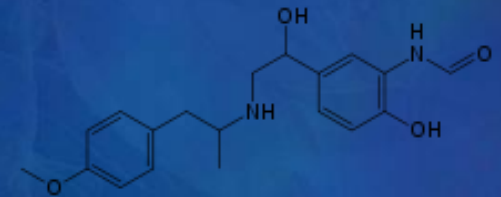
## Most common long acting B<sub>2</sub> agonists

### *Salmeterol*



Takes about 30 minutes to start to work , reaches peak effectiveness after 3 or 4 hours and lasts for more than 12 hours

### *Formeterol*



starts to work within a few minuts and also lasts for more than 12 hours



- **Anti IgE therapy :-**
  - Omali zumab ( xolair) is a recombinant . humanize monoclonal
  - Anti IgE anti bodies used for ttreatment IgE mediated disease
- **Other drugs:-**
  1. Oral corticosteroids
    - Used for poorly controlled severe asthma.
  2. Antihistamine (Ketotifen)
    - Not proven to beneficial
    - Used in children with multiple allergens.



- Immunotherapy

There is insufficient data to recommend routine treatment with immunotherapy for allergy asthmatics.

There is a risk of induction of severe bronchospasm

The ideal protocol is still under investigation.

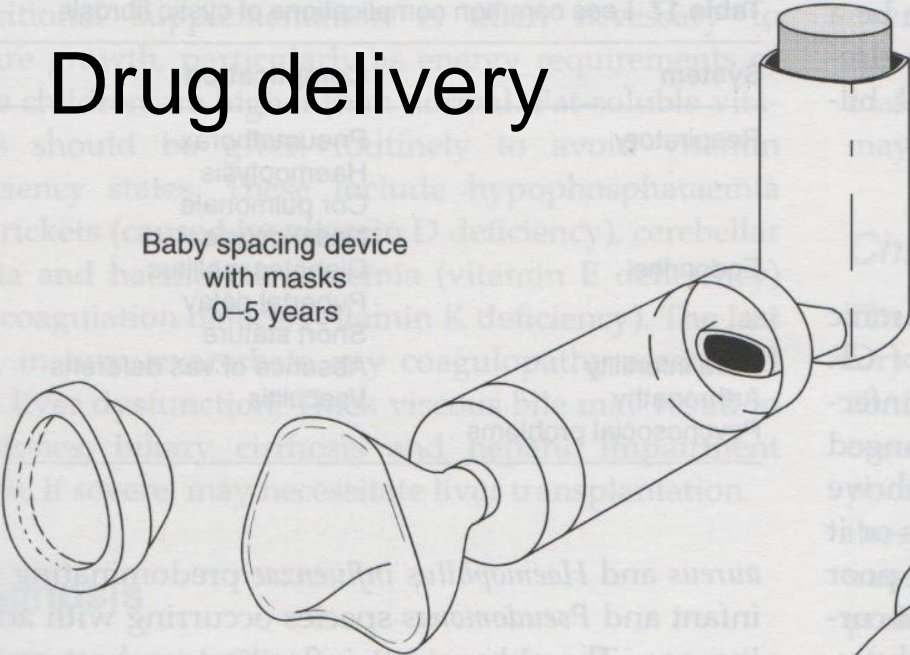


<b>Drug</b>	<b>Low dose</b>	<b>Medium dose</b>	<b>High dose</b>
<b>Beclomethasone dipropionate</b>	80-320 mcg	320-640 mcg	>640 mcg
40 mcg/puff	(2-8 puffs-40 mcg)	(8-16 puffs-40 mcg)	(>16 puffs-40 mcg)
80 mcg/puff	(1-4 puffs-80 mcg)	(4-8 puffs-80 mcg)	(>8 puffs-80 mcg)
<b>Budesonide</b>	100-200 mcg	200-400 mcg	>400 mcg
200 mcg/dose		(1-2 inhalations-200 mcg)	(>2 inhalations-200 mcg)
<b>Flunisolide</b>	500-700 mcg	1,000-1,250 mcg	>1250 mcg
250 mcg/puff	(2-3 puffs)	(4-5 puffs)	(>5 puffs-1250 mcg)
<b>Fluticasone</b>	88-176 mcg	176-440 mcg	>440 mcg
MDI: 44, 110, 220 mcg/puff	(2-4 puffs-44 mcg)	(4-10 puffs-44 mcg) or (2-4 puffs-110 mcg)	(>4 puffs-110 mcg) or (>2 puffs-220 mcg)
DPI: 50, 100, 250 mcg/dose	(2-4 inhalations-50 mcg)	(2-4 inhalations-100 mcg)	(>4 inhalations-100 mcg) or (>2 inhalations-250 mcg)
<b>Triamcinolone acetonide</b>	400-800 mcg	800-1,200 mcg	>1,200 mcg
100 mcg/puff	(4-8 puffs)	(8-12 puffs)	(>12 puffs)
<b>Mometasone</b>	220 mcg	220-440 mcg	>440
(Age 12+ years) 220 mcg/dose	(1inhalation)	(1-2 inhalations)	(>2 inhalations)

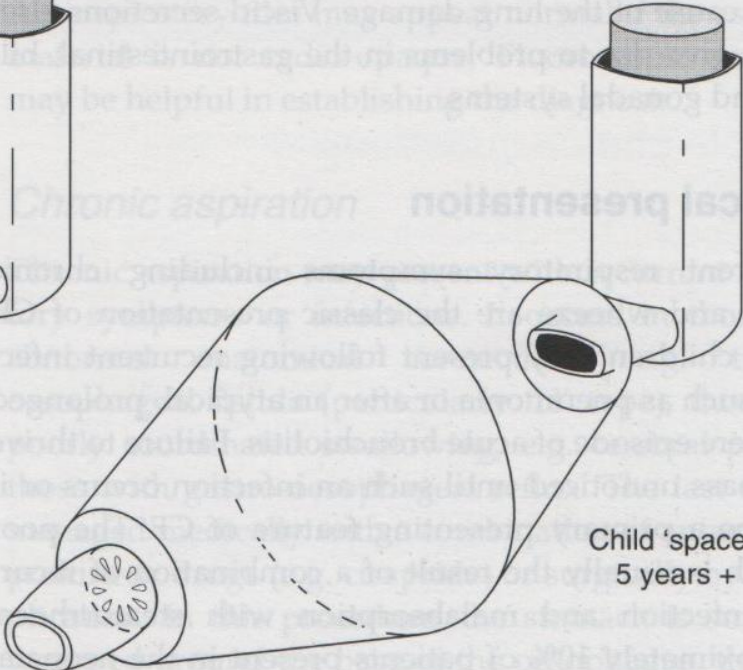


# Drug delivery

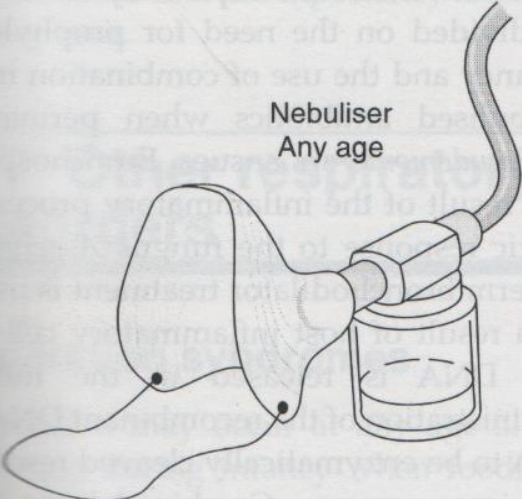
Baby spacing device  
with masks  
0-5 years



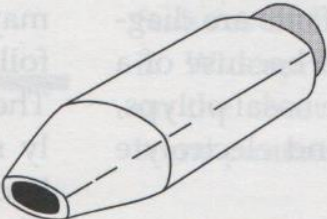
Child 'spacer'  
5 years +



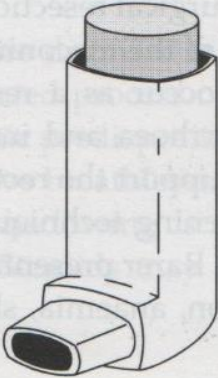
Nebuliser  
Any age



Rotahaler  
8 years +



Metered dose inhaler  
10 years +



# Main reasons for increased mortality are :

- Faulty assessment of severity of illness either by doctor or patient.
- Late or suboptimal hospital treatment.
- Lack of medical care.
- Lack of knowledge of disease.
- Delayed use of steroids
- Over dependence on inhaled  $\beta_2$  agents.



