Reduced airflow is caused by

- bronchospasm,
- inflammation of and edema of bronchial mucosa
- plugging of small airways with secretions
3. Environment
Cold Air, Fog, Ozone, Sulfur Dioxide, Nitrogen Dioxide, Tobacco Smoke, Wood Smoke.

4. Emotions
Anxiety, stress, laughter.

5. Exercise
Particularly in cold dry climate.

6. Drugs and Preservatives
Aspirin, NSAIDS (COX inhibitors), Benzalkonium Chloride, B – Blockers.
Clinical Presentation

Characterized by episodic dyspnoea associated with wheezing. NB: Not all wheezing is asthma. A wheeze is a high pitched whistling sound created by turbulent airflow through obstructed airway.

- Patient may present with chronic persistent cough as the only symptom.
- Diagnosis based on good history of recurrent episodes of dyspnoea and / or wheezing,
- Patient may also complain of chest tightness or burning sensation.
- Severity ranges from intermitent mild symptoms to continous disabling respiratory sx
Factors Contributing To Asthma Severity.

1. Respiratory Infections

- Viral infections and not bacteria are responsible. e.g. viral upper respiratory tract infection is the major cause of severe acute asthma in children.

- This includes; rhino virus, para influenza virus, corona virus and influenza virus.
Patient education on environment:
- control measures, how to identify and avoid environmental precipitants.
- Educate patient on daily self – management plan and action plan

2. **oxygen therapy in patients requiring emergency therapy for acute severe asthma.**

3. Mechanical ventilation may be required in severe respiratory distress
iii) Chromolyn Sodium And Nedocromil Sodium

- Cromolyn Sodium is used for prophylactic treatment of asthma.
- The exact mechanism of action not known.
b) Systemic Glucocorticoid Therapy

Acute severe asthma or status asthmaticus is treated with high dose systemic glucocorticoids combined with frequent administration of inhaled β2 – agonist.

- Glucocorticoid can be administered by parenteral route e.g.
  - Methylprednisolone Sodium Succinate
  - Hydrocortisone Sodium Succinate
- Oral route: Prednisone, MethylPrednisolone.

NB: either route provides rapid onset of action and systemic effect.
Adverse Effects of Chronic Systemic Glucocorticoid Administration

- Hypothalamic–pituitary adrenal suppression.
- Growth retardation.
- Skeletal muscle myopathy.
- Osteoporosis/fractures.
- Psychiatric disturbances.
- Sodium and water retention.
- Hypokalemia/hyperglycemia.
Algorithm for Management of Acute Asthma in Children

**Severity**

**MILD**
- Nebulised β2 agonist
- Improved
- Observe for 60 min
- Discharge with improved long term treatment and asthma action plan

No improvement

**MODERATE**
- Nebulised β2 agonist 3 doses at 20 min intervals + O₂ (8 L via facemask) ± oral steroids ± ipratropium bromide
- Improved
- Observe for further 60 min
- Discharge with β2 agonist ± oral steroids, improved long term treatment and asthma action plan

No improvement

**SEVERE**
- Admit to Ward

**Continuous Observation**
- Improved
- Review

- No improvement

**Consider:**
- Parenteral β2 agonist
- I/V Aminophylline
- Intensive care
CFC free inhalers

- HFA propellants
- Warmer spray
- Slower
- Different taste
- Smaller particle sizes hence lower doses
Dry powder inhalers

- Inspiratory flows in children
- Flows in an attack
- Need to hold your breath as for MDIs
- Twice as potent as MDIs
- Approved OD use
- Preferably in morning
Written Asthma Action plan

An integral part of asthma mx is the dev of a written asthma action plan by the person with asthma and/or their carer together with their Clinician.

- It helps them recognise worsening asthma and gives clear instructions on what to do in response.

- The aim is to help the person with asthma and/or their carer take early action to px or ↓ the severity of an asthma attack.

- The process of developing the plan is important, as this should be a discussion of the person’s individual asthma and its mx.

- The written plan is a reminder of that discussion.
RED ZONE: Medical Alert!

- I am very short of breath, or quick-relief drugs have not helped, or I cannot do usual activities, or symptoms are the same/worse after 24 hours in the yellow zone. DRUG: ________________________________
  HOW MUCH & WHEN: ________________________________

- After taking this drug, call the doctor NOW! Go to the hospital or call 911 for an ambulance if still in the red zone after 15 minutes AND I have not reached my doctor.

- DANGER SIGNS:
  - Trouble walking and talking due to shortness of breath.
  - Lips or fingernails are blue.
  - Take 4 or 6 puffs of quick relief medicine and go to the hospital/call an ambulance!
Patient advice (DIPS)

DIPS: covers most of the important parts regarding correct use of inhalers.

i) **D) Dosage.**

- Is the patient going to be using 1 or 2 inhalations?
- Will the dosage be scheduled or as needed?
- Discuss the indication of the medication—rescue, long-term control, or combination product.
- If a bronchodilator and maintenance medications are prescribed, the patient needs to use the bronchodilator first, wait 5 minutes, and then use the maintenance inhaler.
Dry powder inhalers

- The patient needs to keep the inhaler parallel to the ground after the dose has been released to keep the powder in the delivery channel before inhalation.

- Be sure to warn the patient that humidity, including patient breath, can cause the powder to clump together.

- Patient exhalation into the device prior to inhalation can also cause that dose to exit the device.