
# ASTHMA

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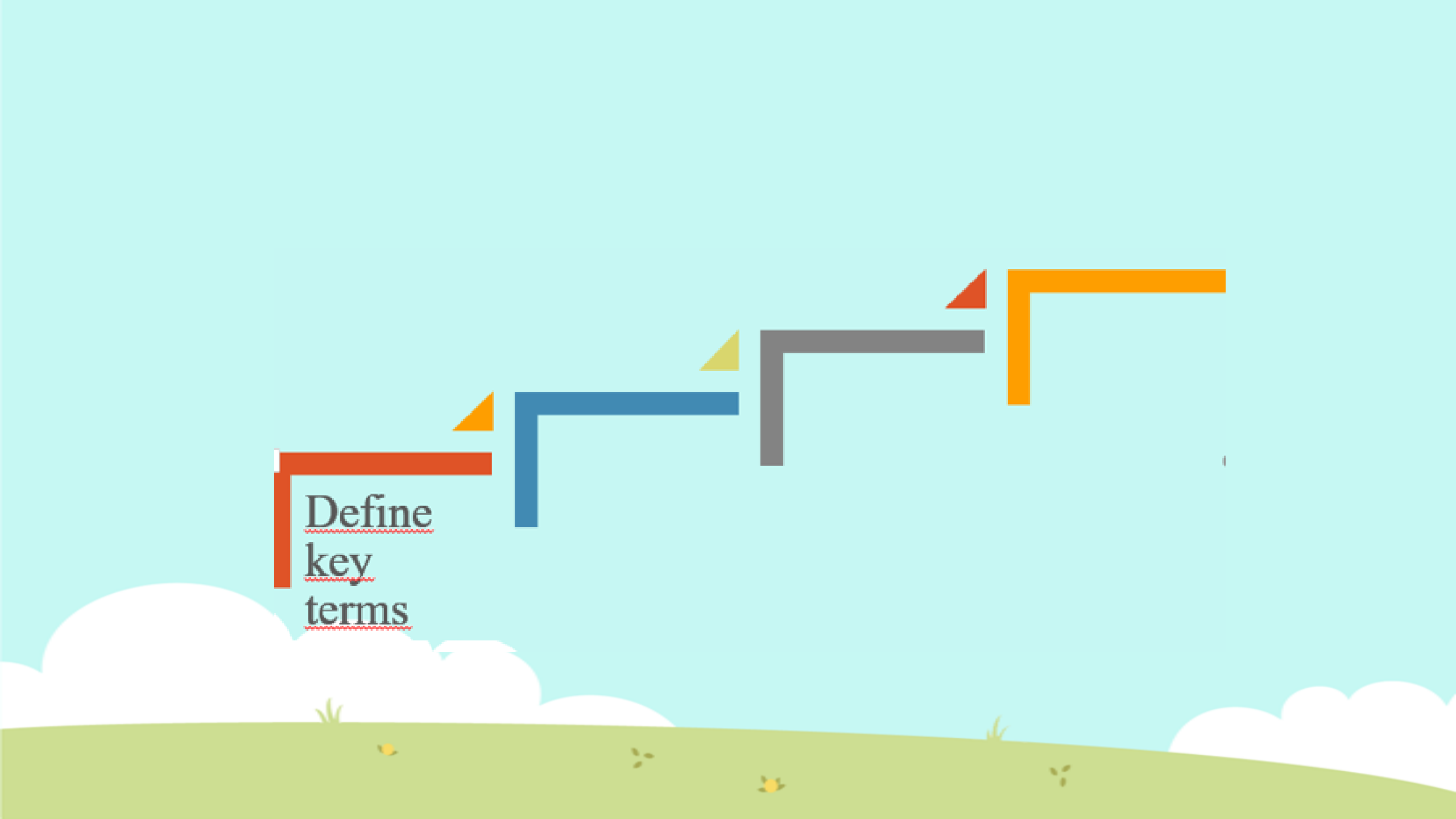

Define
key
terms

# What is ASTHMA?

Do you know anything about asthma?

# ASTHMA

- is a common long term inflammatory disease of the airways of the lungs. It is characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Symptoms include episodes of wheezing, coughing. chest tightness, and shortness of breath.
- These episodes may occur a few times a day or a few times per week. Depending on the person they may become worse at night or with exercise

# Signs and symptoms

- Asthma is characterized by recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing. Sputum may be produced from the lung by coughing but is often hard to bring up. During recovery from an attack, it may appear pus-like due to high levels of white blood cells called eosinophils.
- Symptoms are usually worse at night and in the early morning or in response to exercise or cold air.
- Some people with asthma rarely experience symptoms, usually in response to triggers, whereas others may have marked and persistent symptoms

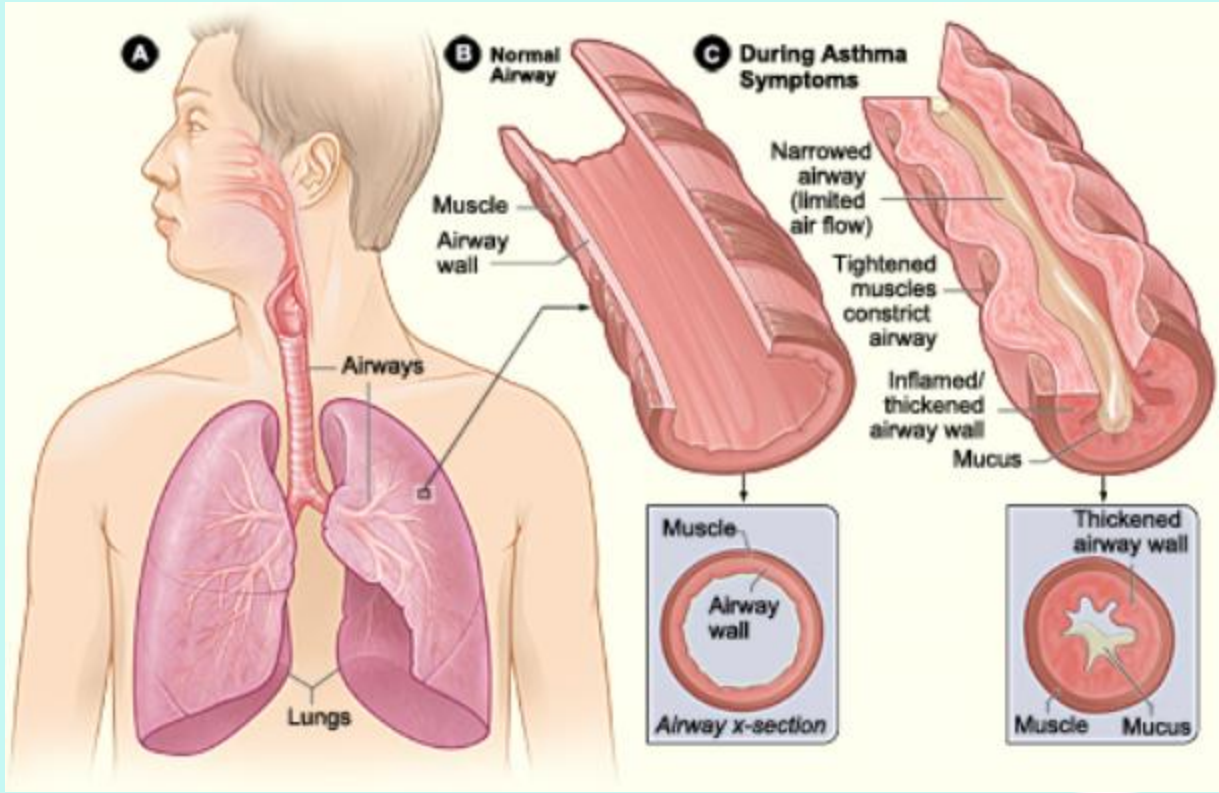
# Classification

**Clinical classification (≥ 12 years old)**[7]

| Severity | Symptom frequency | Night time symptoms | %$FEV_1$ of predicted | $FEV_1$ Variability | SABA use |
|---|---|---|---|---|---|
| **Intermittent** | ≤2/week | ≤2/month | ≥80% | <20% | ≤2 days/week |
| **Mild persistent** | >2/week | 3–4/month | ≥80% | 20–30% | >2 days/week |
| **Moderate persistent** | Daily | >1/week | 60–80% | >30% | daily |
| **Severe persistent** | Continuously | Frequent (7×/week) | <60% | >30% | ≥twice/day |

# Causes

- Environmental
- Hygiene hypothesis
- Use of antibiotics
- Genetic
- Medical conditions




# Pharmacologic Therapy of Asthma

- **Short-acting beta$_2$ –adrenergic agonists.** These are the medications of choice for relief of acute symptoms and prevention of exercise-induced asthma.
- **Anticholinergics.** Anticholinergics inhibit muscarinic cholinergic receptors and reduce intrinsic vagal tone of the airway.
- **Corticosteroids.** Corticosteroids are most effective in alleviating symptoms, improving airway function, and decreasing peak flow variability.
- **Leukotriene modifiers.** Anti Leukotrienes are potent bronchoconstrictors that also dilate blood vessels and alter permeability.
- **Immunomodulators.** Prevent binding of IgE to the high affinity receptors of basophils and mast cells.

# Peak Flow Monitoring

- **Peak flow meters.** Peak flow meters measure the highest airflow during a forced expiration.
- **Daily peak flow monitoring.** This is recommended for patients who meet one or more of the following criteria: have moderate or severe persistent asthma, have poor perception of changes in airflow or worsening symptoms, have unexplained response to environmental or occupational exposures, or at the discretion of the clinician or patient.
- **Function.** If peak flow monitoring is used, it helps measure asthma severity and, when added to symptom monitoring, indicates the current degree of asthma control.

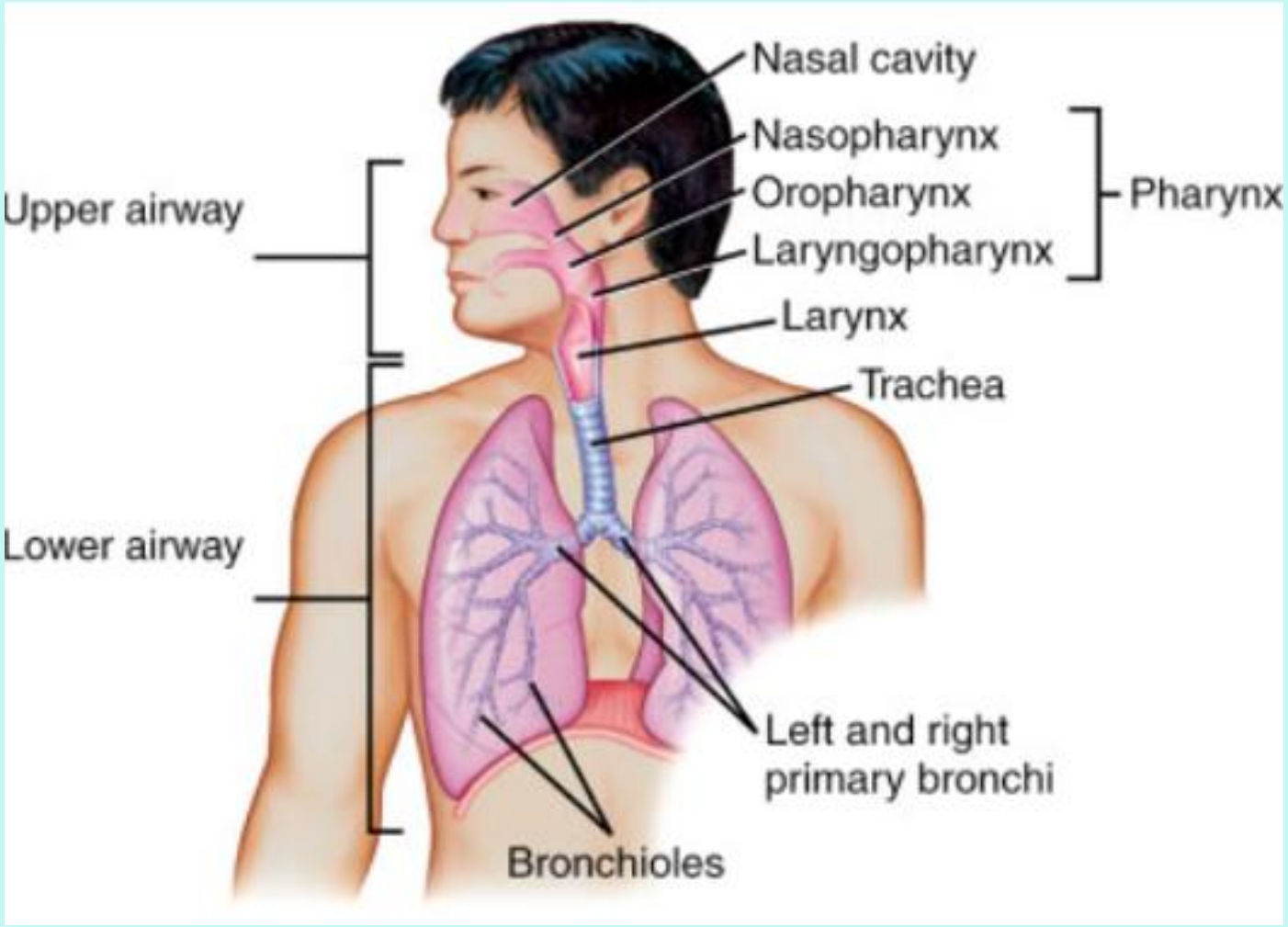

If your child's reading is above the green mark follow their regular medication plan.

If your child's reading is between the yellow markers, their asthma might be worsening. Follow their asthma action plan to get back to your child's green zone.

If your child's reading is below the red mark you need to seek medical advice immediately.


Define key terms

Anatomy and physiology of the respiratory system


Nasal cavity
Nasopharynx
Oropharynx
Laryngopharynx
Pharynx
Upper airway
Larynx
Trachea
Lower airway
Left and right
primary bronchi
Bronchioles

# Developmental Anatomy

- Lung and chest wall development (2-8 yrs)

**The proces of alveolization continues beyond the infant age:**

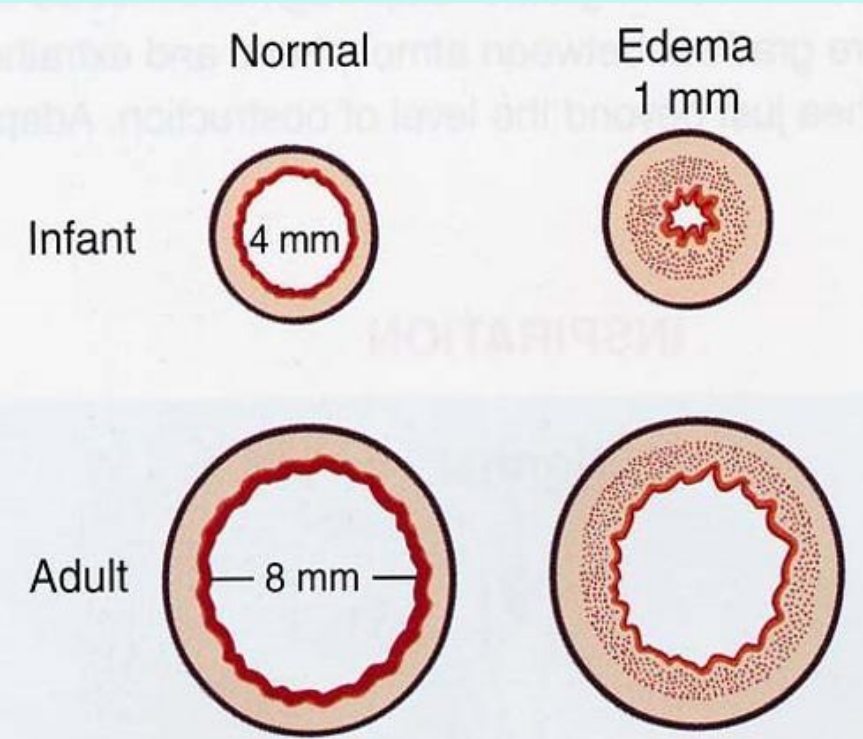
- 20-50 milion alveoli at birth in a term infant
- 300 milion by the age of 8 years

**Increase in alveolar surface area**

- 2.8 m2at birth
- 32 m2at 8 years of age
- 75 m2by adulthood

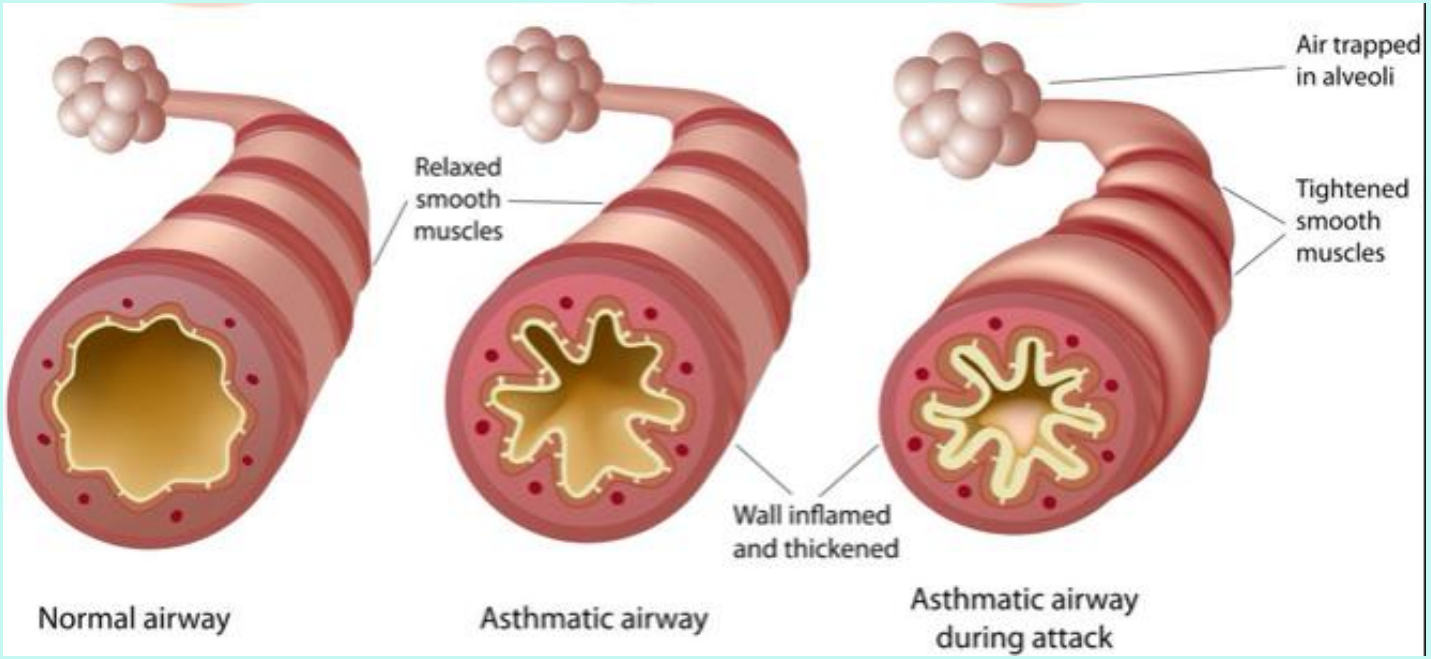
# Resistance: Kids vs Adults

- The main site of airway resistance in the adult is the upper airway; however, it has been shown that peripheral airway resistance in children younger than 5 years of age is four times higher than adults  the major site of resistance is the mediumsized bronchi



# Key Function

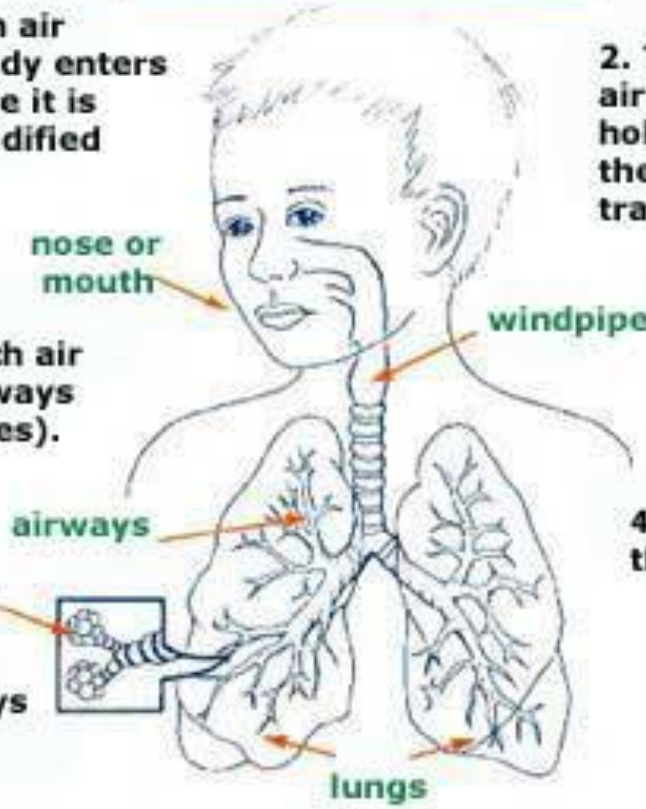
- Oxygenation & Ventilation




# The breathing path...

1. Oxygen-rich air outside the body enters the nose where it is warmed, humidified and filtered.

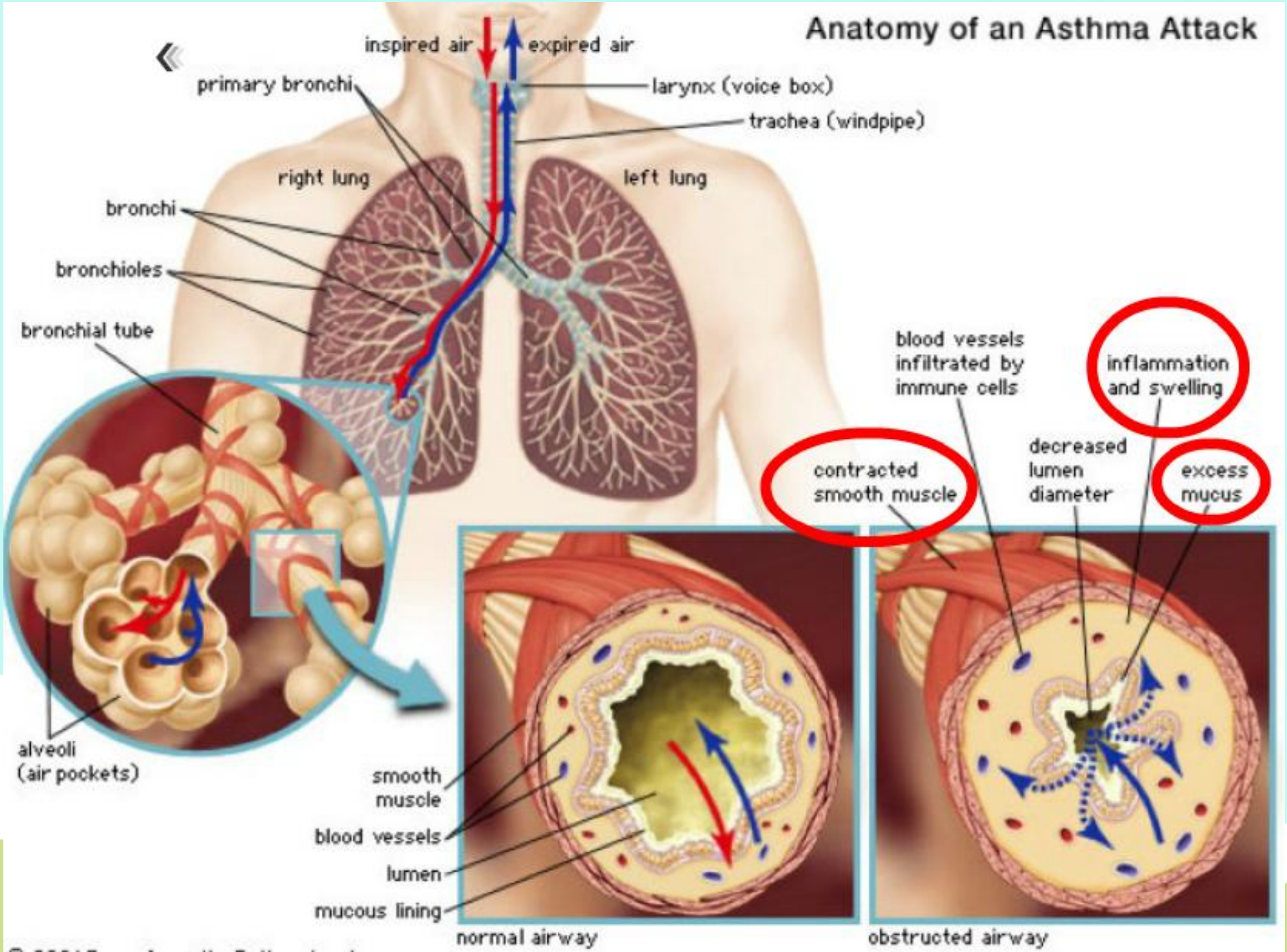
2. The oxygen-rich air goes down a hollow tube called the windpipe (or trachea).




3. The oxygen-rich air goes into the airways (or bronchial tubes).

4. The air enters the two lungs.

5. At the ends of the smallest airways are tiny air sacs (or alveoli).


Anatomy of an Asthma Attack
inspired air
expired air
primary bronchi
larynx (voice box)
trachea (windpipe)
right lung
left lung
bronchi
bronchioles
bronchial tube
alveoli
(air pockets)
blood vessels
infiltrated by
immune cells
inflammation
and swelling
contracted
smooth muscle
decreased
lumen
diameter
excess
mucus
smooth
muscle
blood vessels
lumen
mucous lining
normal airway
obstructed airway

Define key terms

Anatomy and physiology of the respiratory system

Explain appropriate nursing interventions for children with asthma

# The nursing care plan

- The nursing care plan focuses on preventing the hypersensitivity reaction, controlling the allergens, maintaining airway patency and preventing the occurrence of reversible complications.

# Nursing Interventions

- **Assess history.** Obtain a history of allergic reactions to medications before administering medications.
- **Assess respiratory status**. Assess the patient's respiratory status by monitoring the severity of symptoms, breath sounds, peak flow, pulse oximetry, and vital signs.
- **Assess medications.** Identify medications that the patient is currently taking. Administer medications as prescribed and monitor the patient's responses to those medications; medications may include an antibiotic if the patient has an underlying respiratory infection
- **Pharmacologic therapy.** Administer medications as prescribed and monitor patient's responses to medications.
- **Fluid therapy.** Administer fluids if the patient is dehydrated.

# Nursing Interventions

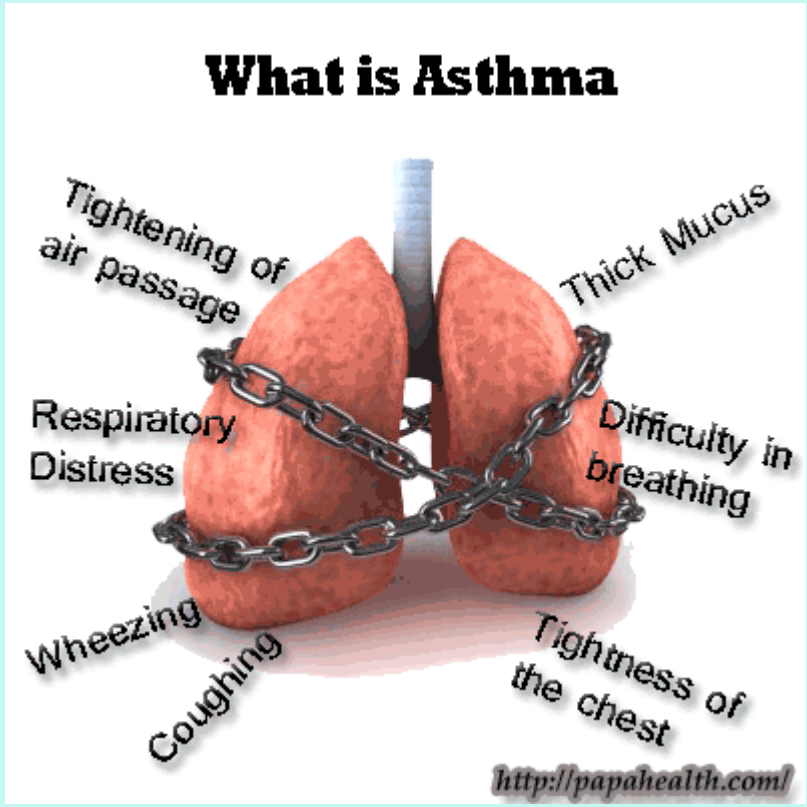
- Assess the respiratory rate, depth, and rhythm - signs of impending respiratory distress.
- **Assess client's level of anxie**ty - not being able to breathe properly.
- **Assess breath sounds** and adventitious sounds such as wheezes and stridor.
- **Assess for signs of dyspnea** (flaring of nostrils, chest retractions, and use of accessory muscle).
- **Monitor oxygen saturation**.
- **Monitor arterial blood gasses.**
- **Plan for periods of rest between activities**.
- **Maintain head of bed elevated**

# Ineffective Breathing Pattern

- Inspiration and/or expiration that does not provide adequate ventilation

**Possibly evidenced by**

- Cough.
- Cyanosis.
- Dyspnea,
- Nasal flaring.
- Prolonged expiration.
- Respiratory depth changes.
- Tachypnea.
- Use of accessory muscles.

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Case Studies

# Case Studies

- A 3-year-old boy presents to the emergency department because for the past 24 hours he has had cough, wheeze, and increasing shortness of breath that began shortly after the onset of a low-grade fever and rhinorrhea. He is agitated and talking in short phrases only, with a respiratory rate of 40 per minute, a heart rate of 130 beats per minute, and oxygen saturation of 89% with the patient breathing room air. Examination of the chest reveals moderate intercostal and subcostal retractions. On auscultation, you note reduced breath sounds throughout the lung fields with widespread expiratory wheeze. Other than a clear nasal discharge, the remainder of the physical examination reveals no abnormalities.

2.

# What symptoms might indicate respiratory distress in the child?

- past 24 hours he has had cough,
- wheeze,
- and increasing shortness of breath that began shortly after the onset of a low-grade fever and rhinorrhea,
- he is agitated and talking in short phrases only,
- with a respiratory rate of 40 per minute,
- heart rate of 130 beats per minute,
- oxygen saturation of 89% with the patient breathing room air,
- moderate intercostal and subcostal retractions,
- note reduced breath sounds throughout the lung fields with widespread expiratory wheeze.

# What other common related triggers tend to affect children and teenagers with asthma?



# Nursing Diagnosis

- Ineffective airway clearance related to increased production of mucus and bronchospasm.
- Impaired gas exchange related to altered delivery of inspired O2.
- Anxiety related to perceived threat of death.
- Activity intolerance related to high respiratory demand as evidenced by increased work of breathing and requirement for frequent rest when playing

# Nursing intervention

- Auscultation of breath sounds and record sounds like crekels breath, wheezing.
- Assess respiratory frequency and depth of chest expansion. Record the respiratory effort including the use of auxiliary respiratory muscles / nasal dilation.
- Elevate the head and help change the position.
- Observation of the pattern of coughing and secretions character.

# Evaluation

- To determine the effectiveness of the plan of care, evaluation must be performed. The following must be evaluated:
- Maintenance of airway patency.
- Expectoration or clearance of secretions.
- Absence /reduction of congestion with breath sound clear, noiseless respirations, and improved oxygen exchange.
- Verbalized understanding of causes and therapeutic management regimen.
- Demonstrated behaviors to improve or maintain clear airway.
- Identified potential complications and how to initiate appropriate preventive or corrective actions.


THANK YOU.
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