

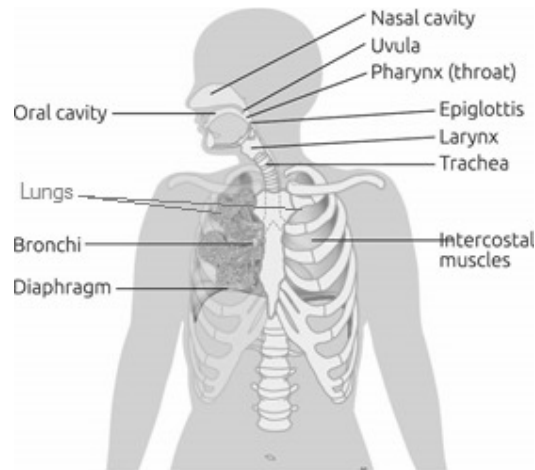
## **B.1      RESPIRATION**

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Oxygen is essential to life. Every time we breathe in, air containing oxygen enters the lungs. When we breathe out air containing waste products is removed from the lungs. In each inspiration we take approximately 500 cc of air in.

Respiration is defined as the transport of oxygen from the outside air to the cells within the body tissues, and the transport of carbon dioxide (a waste product) in the opposite direction.

### **B.1.1      THE RESPIRATORY SYSTEM**

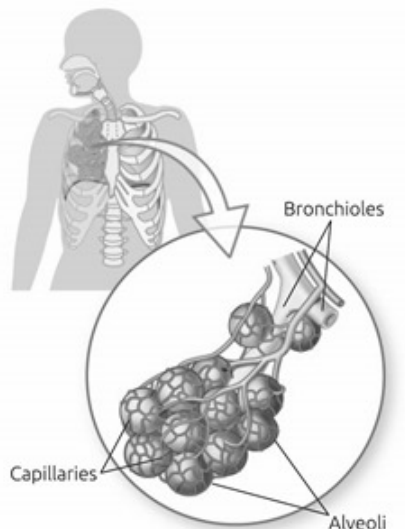


#### **B.1.1.1      THE AIR PASSAGES**

The air passages consist of the nose, throat (pharynx), wind pipe (trachea) and air-tubes (bronchi). The bronchi divide into minute branches (bronchioles) which end in the lung substance (alveoli).

#### **B.1.1.2      THE LUNGS**

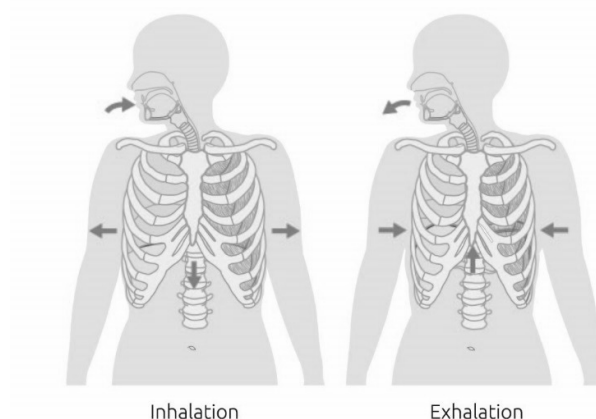
The lungs (two in number) are situated on the right and left sides of the chest cavity. Each lung is made up of a number of small sacs, called alveoli. The lungs are covered by a membrane called 'pleura' which lines the inner wall of the chest cavity.



### **B.1.2 THE RESPIRATORY MUSCLES**

The respiratory muscles, diaphragm, intercostal and abdominal muscles help to contract and expand the lungs to facilitate the breathing.

### **B.1.3 MECHANISM OF RESPIRATION**



During inspiration (breathing in), the diaphragm (the muscle separating the chest from the abdominal cavity) flattens and increases the chest capacity from above downwards. The ribs move upwards and forwards increasing the capacity of the chest cavity from front to back by the action of the muscles situated between the ribs; the lungs thus expand and air enters them. This is an active process.

During expiration (breathing out) the reverse process takes place. The diaphragm comes back to its original state and the ribs fall back thus forcing the air out of the lungs. This is a passive process.

Small blood vessels (capillaries) surround the alveoli. The exchanges of oxygen and carbon dioxide take place through the blood circulating in these capillaries. Oxygen is absorbed by the red blood corpuscles of the blood; water vapour and carbon dioxide are let out from the blood plasma into the alveoli and expelled out.

The lungs are also supplied with nerves which are connected to an area in the brain called respiratory centre. This centre controls the respiration.

## **B.2 NO BREATHING OR DIFFICULT BREATHING**

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Asphyxia is a condition in which the lungs do not get sufficient supply of air for breathing. If this continues for some minutes, the breathing and heart action stop and death occurs.



A person can only survive a few minutes without breathing and a beating heart.

### **B.2.1 CAUSES OF NO BREATHING**

#### **B.2.1.1 CONDITIONS AFFECTING THE AIR PASSAGE**

Following reasons can cause no breathing:

##### **B.2.1.1.1 OBSTRUCTION OF THE AIR PASSAGE**

- foreign body inhalation- as a coin inhaled by a child or artificial tooth by an adult;
- food going down the air passage;
- sea weeds, mud or water getting into air passage during drowning;
- bronchial asthma;
- tongue falling back in an unconscious person;
- swelling of tissues of the throat as a result of scalding (burning by steam or boiling fluids or corrosives) or allergic reactions;
- inhaling irritant gases (coal gas, motor exhaust fumes, smoke, sewer and closed granary gas or gas in a deep unused well, etc.).

##### **B.2.1.1.2 COMPRESSION OF THE AIR PASSAGE (USUALLY DELIBERATE, SOMETIMES ACCIDENTAL)**

- Smothering such as covering of the face and nose of an infant or an unconscious person lying face downwards on a pillow, or having a plastic bag covering the face of the victim,
- tying a rope or scarf tightly around the neck causing strangulation,
- hanging or throttling (applying pressure with fingers on the windpipe).

##### **B.2.1.2 CONDITIONS AFFECTING THE RESPIRATORY MECHANISM**

- Epilepsy, tetanus, rabies, etc.;
- nerve diseases causing paralysis of the chest wall or diaphragm;
- poisonous bites (e.g. snake bites like the cobra).

##### **B.2.1.3 CONDITIONS AFFECTING RESPIRATORY CENTRE**

- Overdose of morphia or similar products such as barbiturates (sleeping tablets,
- electric shock,
- stroke.

##### **B.2.1.4 COMPRESSION OF THE CHEST**

- Caving in of earth or sand in mines, quarries, pits or compression by grain in a silo or by beams or pillars in house-collapse;

- crushing against a wall or a barrier or pressure in a crowd (stampede).

#### **B.2.1.5 LACK OF OXYGEN AT HIGH ALTITUDES**

- Low atmospheric pressure where the oxygen level in the atmospheric air is low or due to lack of acclimatization.

#### **B.2.2 WHAT DO I SEE AND ENQUIRE?**

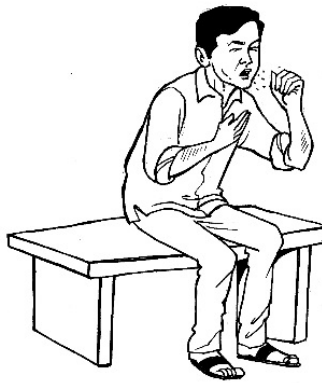


The signs of *no breathing* are:

- there is no flow of air out of the nose or mouth (listen, feel the airflow); and
- the chest of the victim does not move up and down.



Note that even after breathing has stopped the heart may continue to beat for a short while. If you find a person who is not breathing or not breathing normally, you can increase his chances of staying alive by pushing hard and fast in the middle of the person's chest and by giving rescue breaths (CPR).



The signs of *asphyxia* are:

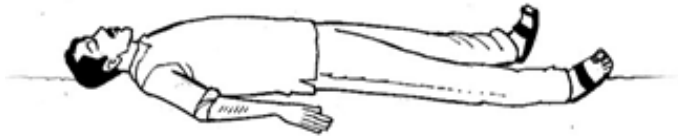
- difficulty in breathing and signs of restlessness;
- the rate of breathing increases;
- the breaths get shorter;
- the veins of the neck become swollen;
- the face, lips, nails, fingers and toes turn blue; and
- the pulse gets faster and feebler.

## **B.2.3 WHAT DO I DO WHEN THE CASUALTY IS NOT BREATHING OR NOT BREATHING NORMALLY?**

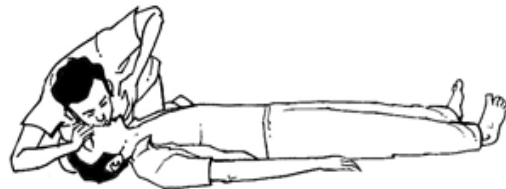
### **B.2.3.1 SAFETY FIRST AND CALL FOR HELP**

1. Make sure there is no danger to you.
2. The person urgently needs help. Shout or call for help if you are alone but do not leave the person unattended. Ask a bystander to seek help or to arrange urgent transport to the nearest healthcare facility. Tell him to come back to you to confirm if help has been secured.

### **B.2.3.2 SECURE AN OPEN AIRWAY AND START CPR**



3. Remove any cause of suffocation, but do not place yourself into any danger doing so.
4. If the person is not on his back, turn him on his back.
5. Kneel down by the side of the person.



6. Start CPR

Do not interrupt the resuscitation until:

- the victim starts to wake up, moves, opens eyes and breathes normally;
- help (trained in CPR) arrives and takes over;
- you become too exhausted to continue; or
- the scene becomes unsafe for you to continue.



7. Cover the casualty.

8. If the breathing starts again:
  - a. Keep the victim covered to keep him warm.
  - b. Arrange urgent transport to a hospital.
  - c. Do not leave the victim alone and continue to observe him.
  - d. If the breathing stops, restart CPR.

### **B.2.3.3    HYGIENE**

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### **B.2.4    WHEN TO REFER THE CASUALTY TO A HEALTHCARE FACILITY?**



Always urgently transport any person who stopped breathing or has suffered a suffocation incident to the nearest healthcare facility as quickly as possible continuing CPR.

SUMMARY:

