

Respiration rate (R.R):

Is the act of breathing; normal respiration is slightly observable, quiet, effortless, regular, and automatic.

Respiration is defined by physiological functioning as:

- ❖ **External respiration:** the exchange of oxygen and carbon dioxide between the alveoli of the lungs and the pulmonary blood system.
- ❖ **Internal respiration:** the interchange of oxygen and carbon dioxide between the circulating blood and cells throughout the body.
- ❖ **Inspiration (inhalation):** the intake of air into the lungs.
- ❖ **Expiration (exhalation):** refer to breathing out or the movement of gases from the lungs to the atmosphere.
- ❖ **Ventilation:** refers to the movement of air in and out of the lungs.
- ❖ **Respiratory rhythm:** the regularity of the expiration and inspiration it can be described as regular or irregular. Respiration normally spaced.
- ❖ **Eupnea:** breathing that's normal in rate and depth.
- ❖ **Tidal volume:** the amount of air taken during normal inspiration and expiration in adults about 500 ml of air.
- ❖ **Vital capacity:** amount of air exhaled from the lungs after a minimal full inspiration.

Type of breathing:

- a. **Costal (thoracic) breathing:** involves intercostal muscle and other accessory muscle, such as the sternocleidomastoid muscle. It can be observe by the movement of the chest upward and outward.
- b. **Diaphragmatic (abdominal) breathing:** involve the contraction and relaxation of the diaphragm. It can be observe by movement of abdomen.

Regulation of breathing:

Respiration is controlled by:

- a. Respiratory centers in the medulla oblongata and the pons of the brain.
- b. Chemoreceptors located centrally in the medulla and peripherally in the carotid and aortic bodies.

These centers and receptors respond to changes in the concentrations of O₂, CO₂, and hydrogen in arterial blood.

Assessing respiration: Respiration should be assessed by observing chest wall expansion and bilateral symmetrical movement of the thorax. Another way to assess breathing is to place the hand back next to the client's nose and mouth and feel the expired air. Each respiration includes one complete inhalation and exhalation by the client. The rate, depth, rhythm of breath is determined. Normal adults respiratory rate (12 - 20 breath /minute). Respiratory depth can be established by watching the movement of the chest, its generally described as **normal**, **deep**, or **shallow**.

Measuring and recording vital signs

Instructor: Hassan Abdullah Athbi



Fundamentals of Nursing I

- ❖ **Deep respiration:** in which a large volume of air is inhaled and exhaled, inflating most of the lung.
- ❖ **Shallow respiration:** involve the exchange of small volume of air and often the minimal use of lung tissue.

Factors affecting respiration:

- a. **Factors increase the respiratory rate:** (Excitement, exercise, stress and anxiety, acute pain, fever, increased environmental temperature, lowered oxygen concentration and anemia, respiratory and heart disease, some medications, smoking, alteration in acid-base balance, small age population).
- b. **Factors decrease the respiratory rate:** {Decreased environmental temperature, certain medication (e.g., narcotics, sedative), increased intracranial pressure, old age population}.

Altered breathing patterns and sounds:

1. Altered breathing rate:

- a. **Bradypnea:** abnormally slow respiration, respiratory rate (10) or fewer breath per minute in an adults.
- b. **Tachypnea:** abnormally fast respiration, respiratory rate greater than (20) breath per minute in an adults.
- c. **Apnea:** cessation or absence of breathing.

2. Altered breathing volume:

- a. **Hypoventilation:** underexpansion of the lungs, characterized by very shallow respiration.
- b. **Hyperventilation:** overexpansion of the lungs, characterized by very deep, rapid respiration.

3. Altered breathing effort:

- a. **Dyspnea:** difficulty breathing as observed by forced respiration by using accessory muscle in the chest and neck.
- b. **Orthopnea:** ability to breathe only in upright sitting or standing positions.

4. Secretion and coughing:

- a. **Hemoptysis:** presence of blood in sputum.
- b. **Productive cough:** cough with expectorated secretions.
- c. **Nonproductive cough:** a dry, harsh cough without secretion.

5. Breath Sounds:

- a. **Stridor:** a shrill, harsh sound heard during inspiration with laryngeal obstruction.
- b. **Stertor:** snoring or sonorous respiration, usually due to a partial obstruction of the upper airway.
- c. **Wheeze:** continuous, high-pitched musical squeak or whistling sound occurring on expiration and sometimes on inspiration when air moves through a narrowed or partially obstructed airway.
- d. **Bubbling:** gurgling sounds heard as air passes through moist secretions in the respiratory tract.

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NOTE:

- ❖ Respirations are under both involuntary and voluntary control.
- ❖ Count regular respiratory rhythms for 30 seconds and multiply result by 2; and count irregular respiratory rhythms for a full minute.
- ❖ An adult sleeping client's respirations can fall to fewer than 10 shallow breaths per minute. Use other vital signs to validate the client's condition.