



Partners in Quality Care

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Content:

Respiratory System Overview

Conditions and Diseases Affecting the Respiratory System

The Aide's Role in Assisting Client's with Respiratory Disorders

Key Points-Respiratory System

Involves the breathing in of oxygen (inspiration) and the breathing out of carbon dioxide (expiration)

The upper respiratory tract – consists of nose, mouth, sinuses, pharynx, larynx, and top of trachea

The lower respiratory tract – consists of lower trachea, bronchi, and lungs

The Respiratory System and Disorders

Respiration- the movement of air or dissolved gases into and out of the lungs; a single complete act of breathing; the physical and chemical processes (such as breathing and diffusion) by which an organism *supplies* its cells and tissues with the *oxygen* needed for metabolism and *relieves* them of the *carbon dioxide* formed in energy-producing reactions.

The lungs are part of the respiratory system, a group of organs and tissues that work together to help a person breathe. The respiratory system's main job is to move fresh air into the body while removing waste gases. The respiratory and circulatory systems work closely together.

The Parts of the Respiratory System and How They Work

- **SINUSES** are hollow spaces in the bones of your head above and below your eyes that are connected to your nose by small openings. Sinuses help regulate the temperature and humidity of inhaled air.
- The **NOSE** is the preferred entrance for outside air into the respiratory system. The hairs lining the nose's wall are part of the air-cleaning system.
- Air also enters through the **MOUTH**, especially for those who have a mouth-breathing habit, whose nasal passages may be temporarily blocked by a cold, or during heavy exercise.
- The **THROAT (pharynx)** collects incoming air from your nose and mouth then passes it downward to the windpipe (trachea).
- The **WINDPIPE** (trachea) is the passage leading from your throat to your lungs.
- The right lung is divided into three *lobes*, or sections. Each lobe is like a balloon filled with sponge-like tissue. Air moves in and out through one opening- a branch of the bronchial tube. The left lung is divided into two lobes.
- The windpipe divides into the two main **BRONCHIAL TUBES**, one for each lung, which divides again into each lobe of your lungs. These, in turn, split further into bronchioles.

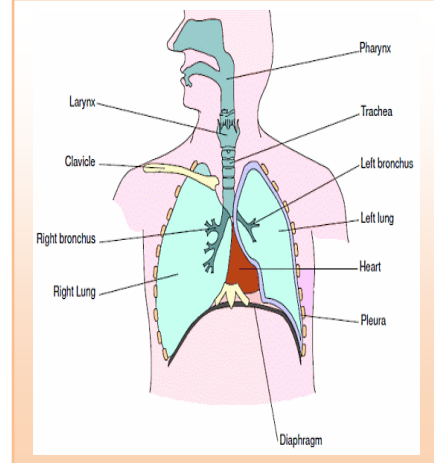
When the respiratory system is mentioned, people generally think of breathing, but breathing is only one of the activities of the respiratory system. The body cells need a continuous supply of oxygen for the metabolic processes that are necessary to maintain life. The respiratory system works with the *circulatory system (heart, blood)* to provide this oxygen and to remove the waste products of metabolism. It also helps to regulate pH of the blood.

In addition to gas exchange, the respiratory system performs other roles important to breathing. These include:

- Bringing air to the proper body temperature and moisturizing it to the right humidity level.
- Protecting the body from harmful substances. This is done by coughing, sneezing, filtering or swallowing them. The entire respiratory system is lined with delicate mucous membrane. Mucous membranes are the body's natural defense against germs.
- Supporting the sense of smell.

Every cell in the body needs oxygen in order to live. The air we breathe contains oxygen and other gases. Once in the lungs, oxygen is moved into the bloodstream and carried through the body. At each cell in the body, oxygen is exchanged for a waste gas called *carbon dioxide*.

The bloodstream then carries this waste gas back to the lungs where it is removed from the blood stream and then exhaled. The lungs and respiratory system automatically perform this vital process, called *gas exchange*.



Tuberculosis (TB) is a disease caused by germs that are spread from person to person *through the air*. (TB is caused by a bacterium called *Mycobacterium tuberculosis*). TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine. TB is spread when a person with TB disease coughs, sings, or speaks and you breathe the air contaminated with TB germs. If a person's body controls the germs, they have latent TB infection. A person gets TB disease when the TB germs multiply and attack the lungs or other parts of the body. A person with TB disease has active TB germs in the body and may give TB germs to others.

Your agency/facility is required to have infection control policies and procedures to screen direct care workers for TB and to have an exposure control plan.

Respiratory System – Changes Due to Aging:

- Respiratory muscles weaken
- Lung tissue gradually becomes less elastic
- Shortness of breath upon exertion
- Lung capacity decreases
- Oxygen in the blood decreases
- Muscles of the diaphragm become weaker
- Limited expansion of the chest due to changes in posture

There are several natural body changes that happen as a person gets older that may cause a decline in lung capacity. Muscles like the diaphragm can get weaker. Lung tissue that helps keep the airways open can lose elasticity, which means the airways can get a little smaller. Also the rib cage bones can change and get smaller which leaves less room for the lungs to expand.

Respiratory System – Variation of Normal:

- Shallow breathing or breathing through pursed lips
- Coughing or wheezing
- Nasal congestion or discharge, or productive cough
- Noisy respirations
- Gasping for breaths
- Cyanosis – changes in skin color, pale or bluish color of lips and extremities
- Dyspnea – difficulty breathing
- Changes in rate and rhythm of breathing
- Need to sit after mild exertion
- Pain in the chest

Tell your supervisor right away if a client/resident:

- Coughs or sneezes a lot
- Coughs up fluid
- Feels dizzy
- Has bluish skin, lips, or nail beds
- Has trouble breathing
- Is very hot or cold
- Makes a whistling sound when they breathe
- Report as directed on the plan of care and talk to your supervisor regarding when to contact emergency services

Other tips in assisting clients/residents (follow the plan of care):

- Don't spread your germs to the client/resident (wash your hands; follow your agency/facility sick policy regarding when you should not work with a client/resident if you are sick with a cold, fever, or other illness)
- Help client/resident walk at a slow and comfortable pace
- Help client/resident rest; build in time for breaks during care
- Help client/resident breathe deeply
- Help client/resident get comfortable in bed
- Encourage the client/resident to eat a healthy diet

DISEASE	RESPIRATORY DISEASE PROCESS
Asthma	A disease characterized by difficulty breathing, wheezing, and a sense of tightness or constriction in the chest due to spasm of the muscles; Asthma is a chronic lung disease that makes it harder to move air in and out of the lungs. With asthma, the airways in the lungs are often swollen or inflamed. Certain “triggers” make the airways swell even more (this narrows the space for air to move in and out of the lungs) and the muscles that wrap around the airways also can tighten, making breathing harder. A trigger could be the common cold, stress, changes in the weather, or things in the environment, such as dust, chemicals, smoke and pet dander.
Chronic Obstructive Pulmonary Disease (COPD)	Emphysema, asthma, and chronic bronchitis and problems related to these diseases. COPD is a chronic lung disease that makes it hard to breathe. With COPD, the airways in the lungs become inflamed and thicken, and the tissue where oxygen is exchanged is destroyed. The flow of air in and out of the lungs decreases. When that happens, less oxygen gets into the body tissues, and it becomes harder to get rid of the waste gas carbon dioxide. As the disease gets worse, shortness of breath makes it harder to remain active.
Pneumonia	Pneumonia is an infection in one or both of the lungs. Many germs, such as bacteria, viruses, and fungi, can cause pneumonia. Pneumonia is not a single disease. When the germs that cause pneumonia reach your lungs, the lungs' air sacs (alveoli) become inflamed and fill up with fluid. This causes the symptoms of pneumonia, such as a cough, fever, chills, and trouble breathing.

Assisting Clients with Respiratory Disorders: (follow the plan of care for your client/resident) :

- Provide rest periods at intervals
- Encourage exercise and regular movement
- Encourage and assist with deep breathing exercises
- Limit exposure to smoke, polluted air, or noxious (harmful) odors by clients/residents with respiratory conditions
- Position clients/residents in a manner to maximize lung expansion
- If a client/resident has asthma, be aware of triggers that may cause an asthma attack, and help minimize the triggers

❖ See pages 4 and 5 of the newsletter for information on Oxygen safety

Oxygen Therapy:

- A person who has difficulty breathing and not receiving enough oxygen through the air may need additional amounts of oxygen
- Oxygen is a drug and may be a part of the client/resident treatment according to a physician order. Follow the plan of care in working with a client/resident who uses oxygen

The client may receive oxygen therapy by:

- Compressed oxygen using a tank
- Liquid oxygen
- Oxygen concentrators
- Portable oxygen concentrators

Respiratory rate: A person's respiratory rate is the number of breaths you take per minute. The normal respiration rate for an adult at rest is 12 to 20 breaths per minute. In normal findings, the character is quiet, even, and without effort. A respiration rate under 12 or over 25 breaths per minute while resting is considered abnormal. Among the conditions that can change a normal respiratory rate are asthma, anxiety, pneumonia, congestive heart failure, lung disease, use of narcotics, or drug overdose.

Talk to your supervisor and know how and what to observe, record and report regarding your client/resident's respiratory rate/status per the plan of care. Always report to your supervisor as directed when a client/resident has difficulty breathing (dyspnea) and discuss with your supervisor when you would need to call emergency services.

References: NIH National Cancer Institute, SEERS training modules, Introduction to the Respiratory System- <https://training.seer.cancer.gov/anatomy/respiratory/> (accessed 3/20/18); <https://www.merriam-webster.com/dictionary/respiration> (accessed 3/20/18); American Lung Association- How Lungs Work- <http://www.lung.org/lung-health-and-diseases/how-lungs-work/> (accessed 3/20 and 3/23/18). Cleveland Clinic- Vital Signs- <https://my.clevelandclinic.org/health/articles/10881-vital-signs> (accessed 3/20/18); NC DHSR/HCP/CARE NAT I Curriculum – July 2013, Module H, Body Systems. Mosby's Textbook for the Home Care Aide, third edition, chapter 5, p. 69; chapter 18, page 335. NC PHCAST Direct Care Basics, Body Systems and Common Diseases, Phase II Module 11. CDC fact sheets-TB- <https://www.cdc.gov/tb/publications/factsheets/general/tb.htm> (accessed 3/27/18). <https://www.cdc.gov/tb/publications/posters/images/StopTBlarge.pdf> (accessed 3/27/18).