Difference Between Respirator and Ventilator

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Key Difference – Respirator vs Ventilator

Respirators and ventilators are two types of devices used in different circumstances to facilitate breathing. **Although ventilators perform the act of respiration mechanically, respirators do not engage in respiration on their own. They only improve the quality of air by removing the contaminants in it.** This can be taken as the key difference between respirator and ventilator. Keeping this difference in mind, respirators can be defined as a set of devices that facilitate respiration either by purifying the air available for the respiration or by providing a source of air whereas a ventilator is a machine that is used to move breathable air in and out of the lungs in the patients who are unable to breathe or have a difficulty in breathing

What is a Respirator?

Respirators are a set of devices that facilitate the respiration by purifying the air available for the respiration or by providing a source of air.

The respirators that remove various contaminants from air and make air suitable for inspiration are called the air purifying respirators (APR). Gas masks that are used to purify the air of chemicals and poisonous gases and particulate respirators that can remove dust and other particles from the breathing air are included in this category.

Figure 01: Gas Mask Respirator

Airline respirators are used when the APRs are not capable of providing adequate protection to the user from the harmful substances contained in the inspiratory air. The use of airline respirators is recommended for the following occasions

- When there are unknown chemicals in the air
- When the concentration of chemicals in the air is unknown
- In the presence of substances that are poorly absorbed by the cartridge of the APRs
- When the amount of oxygen in the atmosphere is extremely low.

There are different types of airline respirators such as

- Tight fitting full face and half mask respirators
- Loose fitting hoods
- Air supplied helmets
- Self- contained breathing apparatus (SCBA)

What is a Ventilator?

A ventilator is a machine that is used to move breathable air in and out of the lungs in patients who are unable to breathe or have a difficulty in breathing.

These machines are used transiently during surgical procedures where the patient is put under general anesthesia. They are also used to facilitate breathing in patients who have intrinsic pulmonary diseases.

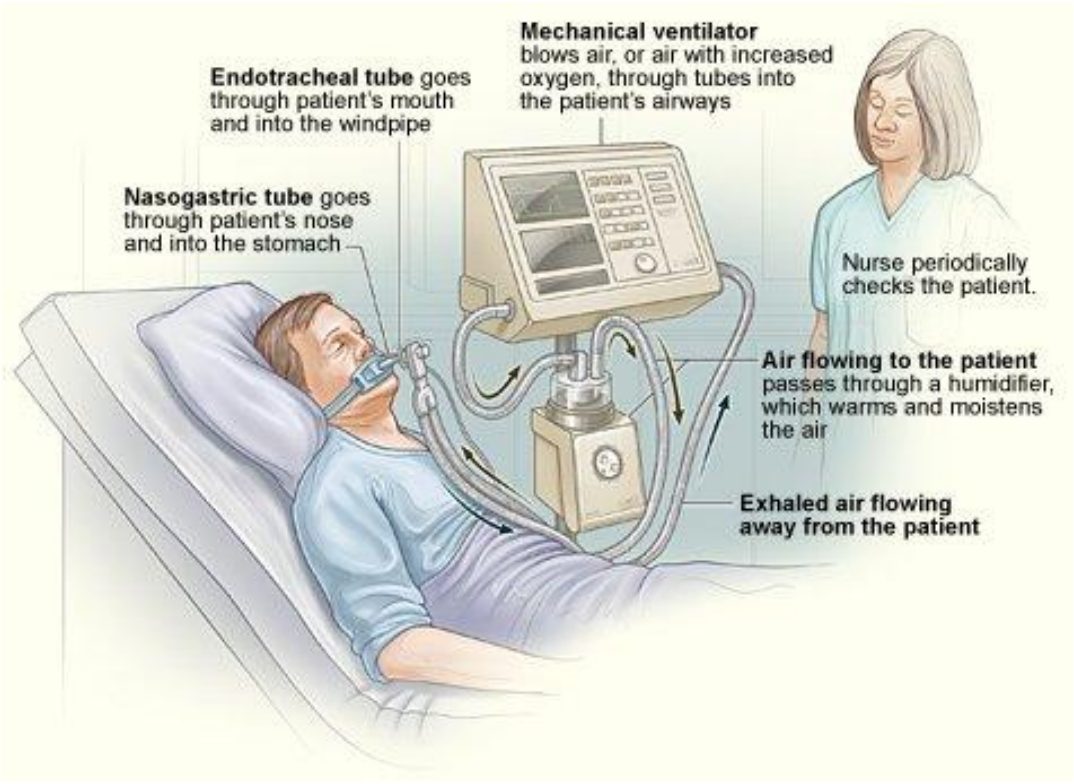

Figure 02: Ventilator

Modes of Mechanical Ventilation

Volume-cycled Mode

In this mode, the inhalation proceeds till an optimum tidal volume is achieved and then the expiration begins. A constant volume of air is supplied throughout the process. Thus, the pressure varies, changing the pulmonary compliance and airway resistance along with it.

Pressure-cycled Mode

A set peak inspiratory pressure is applied and the air moves into the lungs along a changing pressure gradient. When the maximum pressure is attained, passive expiration begins. The volume of air depends on the compliance of the thoracic cavity and the pulmonary tissues.

Improper ventilation can give rise to adverse effects such as volutrauma, air trapping, barotrauma, and oxygen toxicity.

What is the Similarity Between Respirator and Ventilator?

- Both are devices used to facilitate and enhance the efficiency of respiration.

What is the Difference Between Respirator and Ventilator?

Respirator vs Ventilator	
Respirators are a set of devices that facilitate the respiration either by purifying the air available for the respiration or by providing a source of air.	A ventilator is a machine that is used to move breathable air in and out of the lungs in the patients who are unable to breathe or have a difficulty in breathing.
Function	
A respirator is a device that is used to filter and purify the air.	Ventilator does not improve the quality of air. It performs the process of respiration in the patients with respiratory difficulties to sustain their life.

Summary – Respirator vs Ventilator

Respirators are a set of devices that facilitate the respiration either by purifying the air available for the respiration or by providing a source of air. A ventilator is a machine that is used to move breathable air in and out of the lungs in patients who are unable to breathe or have a difficulty in breathing. Unlike ventilators which actually perform the act of respiration, respirators despite do not help the

mechanism of respiration. They only purify the air improving its quality. This is the main difference between respirator and ventilator.

References:

1. Hall, John E., and Arthur C. Guyton. Guyton and Hall textbook of medical physiology. 12th ed. Philadelphia, PA: Elsevier, 2016.

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1. “S10 Gas Mask Respirator” By Skiddie2003 at English Wikipedia – Transferred from en.wikipedia to Commons by Eingangskontrolle (Public Domain) via Commons Wikimedia
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