

Ventilators or respirators are of key importance for COVID patients



Ventilators are a fundamental part of the treatment of seriously ill COVID-19 patients; here are their characteristics.

26/04/2020

During the **COVID-19 pandemic**, people showing severe symptoms may require a **ventilator when hospitalized**, but **what are these devices?**

VENTILATORS

* According to the US National Library of Medicine, a **ventilator** is a machine that provides patients **with respiratory support** when **they are unable to breathe on their own or have difficulty doing so**.

* This process is known as **mechanical, or assisted, ventilation**. It may be required during surgery, due to illness, or as a consequence of complications from a disease.

* Ventilators are also known as **iron lungs** or **respirators**.

THERE ARE TWO TYPES OF VENTILATORS OR RESPIRATORS:

- *Automatic electronic ventilators*
- *Manual ventilators (which may also include some mechanical assistance)*



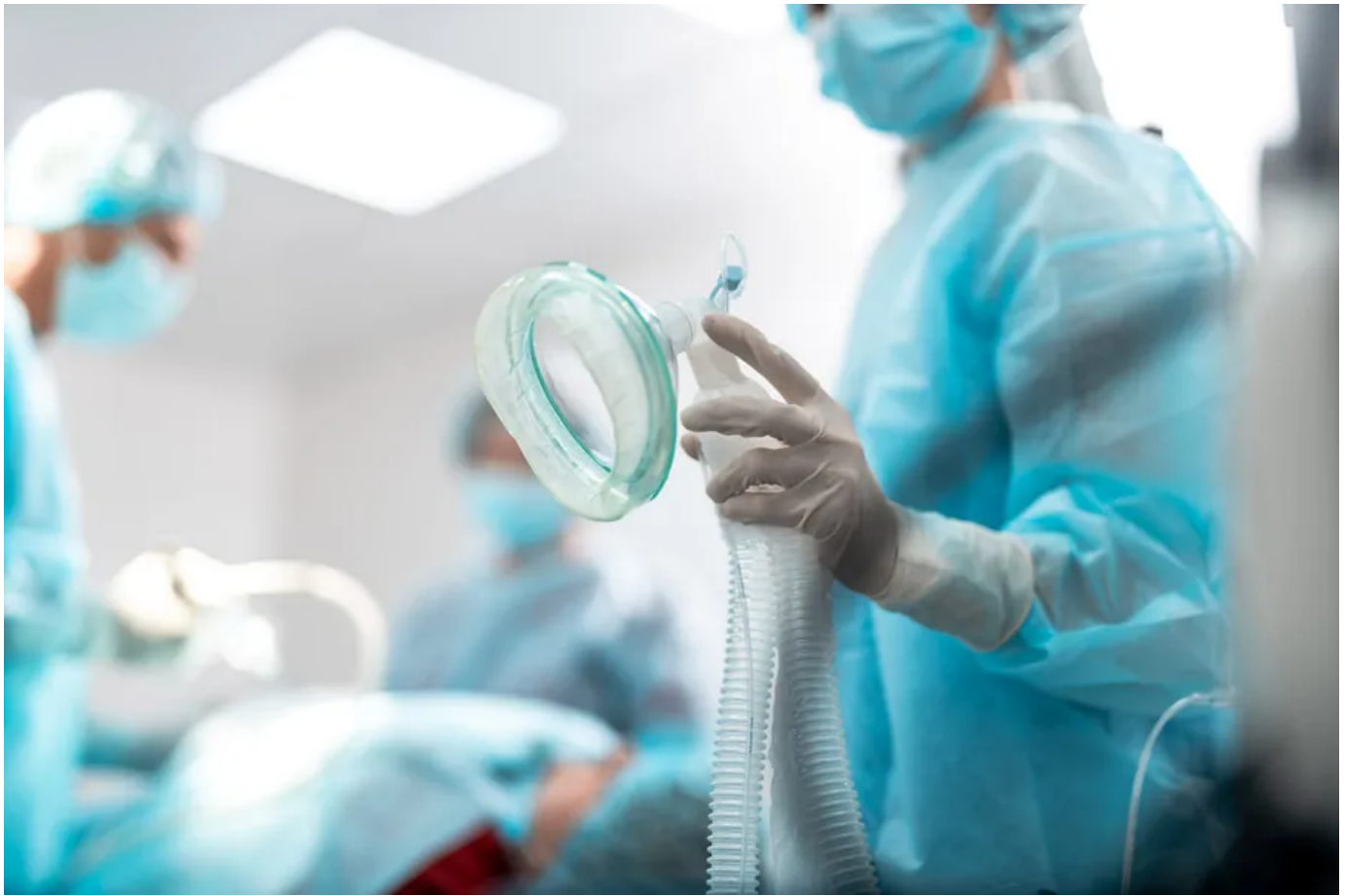
HOW DO THEY WORK?

- * A **ventilator introduces air with extra oxygen into the airways** so that it reaches patients' lungs.
- * On some occasions, it is responsible for 100% of patients' breathing; however, on others it only **partially assists with breathing and provides just the support required**.
- * A **ventilator is more efficient** than using a mask or other devices, because it exerts **enough pressure** to keep the **lungs open, preventing their collapse**, thereby improving the absorption of oxygen into the blood.
- * Most of the time, patients need respirators for hours or days. But the need may extend to weeks, months, or more in some cases.

HOW IS IT CONNECTED?

- * An **automatic ventilator** is **connected** to patients through an **endotracheal tube** that is inserted through the **mouth (intubation)**, or through an opening in the neck (**tracheotomy**).
- * Both procedures mean the tube reaches the trachea. As a result, **both lungs are equally ventilated** with air and oxygen.

The automatic ventilator has **a computer** that produces **sounds** and has **alarms** to warn if any adjustment is needed.



WHEN AND WHY ARE THEY NEEDED?

- * They are used when people have an illness or injury and **are unable to breathe on their own**, or have difficulty doing so.
- * This **ensures** that patients receive **enough oxygen** and carbon dioxide is removed.
- * They are also used after operations in which patients have been **anaesthetized**, making them drowsy and their breathing irregular.

WHAT CARE NEEDS TO BE TAKEN TO USE THEM?

- * **Ventilators are painless**, but patients **cannot speak** due to the endotracheal tube.
- * Some patients need to be **sedated** while intubated, which can be unpleasant and cause discomfort.
- * Other patients **resist** mechanical assistance, so it is preferable to keep them **asleep using medication**, allowing the ventilator to do its job.
- * Patients have **cables and monitors** that **check** their heart and respiratory rates, blood pressure, and oxygen saturation.
- * Sometimes patients are **immobilized** to prevent the removal of any of these monitors, which are **essential** for **recording changes in their health**.

ARE THERE COMPLICATIONS?

- * Patients using ventilators are **monitored** for **lung infections**.
- * Some sedated patients have **difficulty removing the secretions** that are normally found in the airways.
- * These can form **mucous plugs**, meaning patients do not receive enough oxygen, and they can cause **complications** such as **pneumonia**.
- * The way of removing these mucus plugs is through a procedure called **suction**, which is done by inserting a **small tube** into the endotracheal tube.
- * When a respirator is used for several days, patients can receive **all of the energy they require** through **tubes** inserted into a vein or the stomach so as to prevent weight loss or other complications.

Dr. Fernando Castilleja, director of Well-being and Prevention at [TecSalud](#), points out that they have been collaborating with the Tec **School of Science and Engineering** on the development of **mechanical ventilators**.

*"They have developed the technological part and will test the **mechanical prototypes** to see how feasible they are. Tubes called **"splitters"** have been*

invented so a ventilator can be used by 2 patients.

*“The idea is that these techniques reach the **public health** sector where we might see **greater demand**,” he said.*

READ MORE NEWS AT CONECTA: