# What is an ICU Ventilator

*(History and current demand for devices used in ICU Ventilator)*

An ICU ventilator (intensive care ventilator) supports the breathing of a patient who is unable to breathe comfortably without assistance.

The ventilator ensures a controlled delivery of breathing gases (Air and Oxygen) to the patient to sustain their body functions. Controlled supply of breathing gases reduces stress on the patient, and allows their body to direct resources to fighting injury or infection.

At its simplest a ventilator pushes air / oxygen into a patients lungs, and then allows gases to exhaust.

Modern ICU ventilators monitor the composition of gases supplied to a patient, and exhaled by the patient, they modify the mixture, volume, and pressure of gases supplied to maintain optimum conditions. They may be linked to monitoring of other body functions.

- Excess oxygen supply can lead to brain or eye damage in babies.
- A patient can become dependent on breathing support, when removed from ventilation patients can stop breathing and die because they have lost the reflex to breathe for themselves

Modern ventilators also typically have functions that help wean a patient off ventilation, during initial use the ventilator may take over a patients breathing function, during weaning the ventilator progressively reduces support until it detects that the patient is not breathing sufficiently, it then increases support again to ensure sufficient ventilation, and again reduces support to help the patient become independent of ventilation.

Modern ICU ventilators typically have microprocessor control, and can support many different modes of ventilation, and can trigger ventilation from many different triggers (from pressure, from electrical signals from the patients body, or other. They may support patients from premature infants with a lung capacity of a few cc, to a fully grown adult with lung capacity of several litres.

These devices are subject to stringent testing and regulatory compliance, established on the basis of best patient outcome. They support patients breathing with minimal intrusiveness, and maximum comfort.

An infection such as COVID-19 which appears not to severely affect young patients, may not need to support patients with a wide range of lung capacity, and may not need to operate in different modes. Control of the gas mixture may be less critical.

In a crisis situation, a much simpler device might be sufficient to sustain patients, different modes may not be required, and patient comfort may be a lesser consideration. A patient may need to transferred to a more sophisticated machine to wean them off dependency on the ventilator. For national use compliance with standards can be waived, and a reduced survival rate might be judged acceptable where the alternative is much higher mortality without ventilation.

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