



Harms of mechanical ventilation

Mechanical ventilation is a lifesaving procedure for those whose respiratory system fails to perform its normal duty of getting enough oxygen into the blood and getting rid of the carbon dioxide from the blood. Just like any procedure done in the intensive care units, it carries multiple risks that can be fatal. Patients and their families should be aware of those harms and side effects before undergoing mechanical ventilation. Those effects could be short term and easily corrected, but some could have a long-lasting effect, and possibly be fatal leading to patients' demise.

We will summarize some of those harms below, keep in mind they are not inclusive and discussion with your doctor is crucial for more understanding of those risks.

Pain/Anxiety

Pain and anxiety are common during mechanical ventilation procedure as a combination from the endotracheal tube in their mouth, being confined to bed, and the fear of being sick or dying. Usually, analgesics and sedatives are administered during mechanical ventilation to alleviate those problems. The goal is not to put the patient in deep coma, though sometimes that might be necessary.

Pneumonia

Being on mechanical ventilation for more than 48 hours could place a patient at risk for developing a new hospital acquired or ventilator acquired pneumonia. Aspiration of oral secretions into the lung and the reduced cough reflexes put the ventilated patients at higher risks for acquiring pneumonia. Estimates vary widely

in the literature but might be as high as 20-50%. Additionally, the organisms causing those pneumonias could be resistant to multiple antibiotics. Pneumonia can worsen a patient's chance of surviving, prolonging the time on the ventilator, and increasing costs. Thanks to multiple protocols used, the incidence of pneumonias is declining.

Lung injury

The ventilator uses high pressures to push the air into the diseased lung. Using excessive pressures or breath volumes can cause additional lung injury termed ventilator induced or associated lung injury. There are many types of those injuries that unfortunately can hinder the lung recovery and worsen the outcomes of patients on mechanical ventilation.

Effects on the heart and blood pressure

Patients who end up on a ventilator are usually sick not only with lung disease but with many other organ failures. The ventilator can have a negative impact on the heart and blood pressure especially if high pressures and breath volumes are needed to inflate the lung.

Malnutrition

The ventilator can have effects on the digestive system and might cause intolerance to the artificial nutrition given during hospitalization. Studies have shown that a lot of patients develop malnutrition during their critical illness time, probably as a combination of their initial sickness and not receiving enough nutrition.

Muscle weakness

Body muscles can get weaker and atrophy during this critical sickness. Secondary to the initial disease, sedatives and other medications can affect the nerves and the muscles. The ventilator itself can cause atrophy of the diaphragm which is the main muscle for breathing. This can prolong the time spent on the

ventilator. Luckily, this weakness improves eventually with time but might require many months and possibly physical therapy.

Prolonged ventilation

The majority of patients who require mechanical ventilation and survive their initial sickness, should be able to be liberated off the ventilator. However, 5-10% of the patients might require prolonged stay (more than 2-3 weeks, sometimes many months) on the ventilator. Those patients are usually managed by a tracheostomy (a tube surgically inserted directly into the airway in the neck) and sometimes need to be transferred to weaning units in long term facilities.

Depression/Post Traumatic Stress Disorders

There is more evidence that critical illness can cause prolong psychological issues like depression and PTSD that might require psychological or psychiatric treatment after recovery.

To summarize, the ventilator is a lifesaving machine, but it can also impose many other problems to the patient. The current research and knowledge have improved our understanding of those problems so we can further avoid and to better treat them.