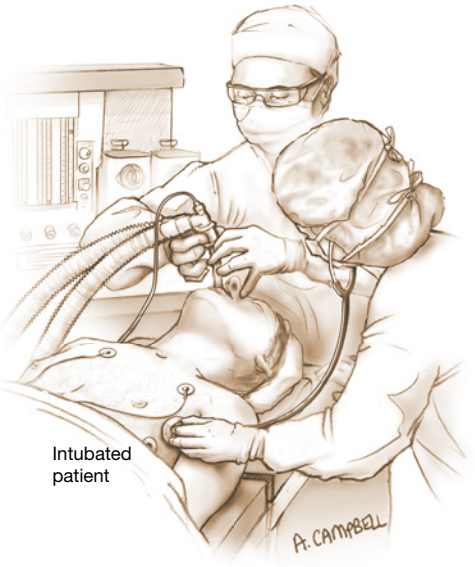
Mechanical Ventilation

Intubation for Starting Mechanical Ventilation



The support of **respiration** (breathing) with devices is known as **mechanical ventilation**. Mechanical ventilation, provided by **ventilators**, is used routinely when persons have **general anesthesia** (unconsciousness) for operations, for critically ill individuals who are in **intensive care units** (ICUs), and on an outpatient basis for some persons who cannot breathe on their own. The amount of oxygen (up to a maximum of 100% oxygen) can be adjusted to the patient's needs. The volume of respiration per breath (**tidal volume**) and number of respirations per minute can also be regulated. Chest x-rays, **arterial blood gases** (blood samples that measure the content of oxygen and carbon dioxide), and continual observation (including listening to the lungs and feeling the pulses) of the patient help to guide doctors and nurses in caring for individuals who need mechanical ventilation. To provide mechanical ventilation, an endotracheal tube must be inserted into a patient's trachea from the mouth or the nose. The procedure, known as **intubation**, is most often done after giving sedative medications, or, in the case of general anesthesia, after medications are given to produce unconsciousness to ensure the patient's comfort. In emergency situations (such as cardiac arrest or during cardiopulmonary resuscitation [CPR]), intubation may be necessary as part of life support measures.
The March 3, 2010, issue of *JAMA* includes an article about mechanical ventilation.

RISKS OF MECHANICAL VENTILATION

- Infection, including pneumonia, sinus infection, and **sepsis** (bloodstream infection), can occur anytime the body's natural barriers are broken. Steps are taken to protect patients who have to remain intubated and on ventilators, to reduce their chances of infection, especially ventilator-associated pneumonia.
- Prolonged intubation can cause damage to the trachea, lips, tongue, teeth, and vocal cords. Careful measures taken by intensive care providers help to reduce this risk. In some cases, **tracheostomy** (a surgically placed breathing tube through an incision in the neck) may be offered to improve a person's care when intubation is required for a longer time period.
- Ventilators, like all other mechanical devices, can malfunction. Sophisticated alarms and system checks are built into the machines to prevent harm.

COMMON REASONS FOR MECHANICAL VENTILATION

- Routine, short-term use during general anesthesia for surgical procedures
- Respiratory failure from pneumonia, chronic obstructive pulmonary disease (COPD—chronic bronchitis, emphysema), acute asthma attack, acute respiratory distress syndrome, or severe viral infections (such as West Nile virus or influenza)
- Severe heart disease
- Neurological diseases that prevent normal breathing
- Sepsis and multiorgan system failure

Sources: National Heart, Lung, and Blood Institute; American Lung Association; Society of Critical Care Medicine; American Society of Anesthesiologists

FOR MORE INFORMATION

- National Heart, Lung, and Blood Institute
  www.nhlbi.nih.gov
- American Lung Association
  www.lungusa.org
- Society of Critical Care Medicine
  www.sccm.org
  www.myICUcare.org

INFORM YOURSELF

To find this and previous JAMA Patient Pages, go to the Patient Page Index on *JAMA*'s Web site at www.jama.com. Many are available in English and Spanish. A Patient Page on intensive care units was published in the March 25, 2009, issue; one on ventilator-associated pneumonia was published in the August 20, 2008, issue; one on lung complications after surgery was published in the October 14, 2009, issue; one on COPD was published in the November 26, 2008, issue; and one on sepsis was published in the February 24, 2010, issue.

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