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# Ventilator-Associated Pneumonia

## What is ventilator-associated pneumonia?

People on breathing machines, called ventilators, have an increased risk of developing pneumonia. Pneumonia is an infection of one or both of the lungs due to bacteria, viruses, and fungi. Ventilator-associated pneumonia (VAP) is caused by germs that enter the lungs when a person is on a breathing machine.

## What is a ventilator?

When a person can't breathe on their own, they need a ventilator. For this, a tube is placed into the person's windpipe through their mouth or through an incision in the front of their neck. The tube is connected to a machine that pushes air with oxygen into the person's lungs.

While on a ventilator, the person can't speak. This is because the breathing tube passes by the voice box in the throat. A person who has a breathing tube and ventilator is treated in a hospital intensive care unit (ICU).

## Who is at risk for VAP?

Certain things increase the chance of developing VAP. They include:

- Long periods of being on a ventilator
- Keeping the head of the bed at less than a 30-degree angle
- Secretions from the throat, stomach contents, or food or liquids getting into the lungs (aspiration)
- Incorrect handwashing by medical staff when handling the ventilator equipment
- Using certain medicines during tube placement
- Taking certain medicines that may increase the growth of germs
- Age, either being very young or very old
- Not cleaning the inside of the mouth on a regular basis
- Not cleaning or replacing the equipment between uses on people

## What are symptoms of VAP?

The signs and symptoms of VAP include:

- Fever
- Increased secretions from the lungs
- Changes in breathing

- Low oxygen levels

## How is VAP diagnosed?

It may be hard to diagnose VAP. Signs and symptoms, a physical exam, and changes on chest X-rays can be helpful as are blood tests and cultures of blood and lung secretions. Sometimes it's necessary to get a sample of lung secretions by passing a scope into the lungs (bronchoscopy).

## How is VAP treated?

VAP is a serious infection that often requires powerful antibiotics. If symptoms don't get better, healthcare providers look for other causes and then figure out the best treatment. Other care includes:

- Close monitoring by specialized ICU staff, including healthcare providers, nurses, and respiratory technicians
- Supportive care, which includes providing supplemental oxygen, removing mucus from the lungs, and giving breathing treatments

## How can VAP be prevented?

Ventilators are routinely used after certain surgeries. If you're scheduled for such a surgery and you smoke, ask your provider for help quitting. People who smoke get more infections.

To keep people from getting VAP, healthcare providers follow certain procedures:

- **Handwashing.** This is the single most important way to prevent the spread of germs. Before and after treating each person, healthcare workers should wash their hands with soap and water. Or they should use an alcohol-based hand cleaner.
- **Raising the head of the bed.** The head of the bed should be kept between a 30-degree and 45-degree angle. This helps prevent bacteria or food from entering the lungs.
- **Cleaning the inside of the person's mouth.** Healthcare providers brush the person's teeth and clean their mouth. This is done often during the day and night. This helps limit the germs that can go down into the lungs.
- **Removing or suctioning mucus and fluids from the mouth and throat.** This helps prevent the person from breathing them in. Mucus and fluids contain germs. If the germs get into the lungs, pneumonia can result.
- **Limiting the use of breathing machines.** Healthcare providers assess the person daily to figure out if they need to stay on the ventilator. The breathing machine is stopped and the tube is removed as soon as the machine is no longer needed.

## To protect your loved one

Use protective gowns and gloves if your loved one is infected with an organism. It's important not to spread any infection to other people in the hospital. You can help prevent your loved one from getting VAP by doing the following:

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- Before entering the hospital room, wash your hands with soap and water. Continue to wash your hands or use a hand cleaner during your visit.
  - It's OK to ask questions and request care for your loved one. Watch to make sure those things that can help prevent VAP are done.
  - Be a supporter or advocate. Ask why something is being done. And ask to have things explained if you don't understand the answers.
  - Make sure that all healthcare providers wash their hands. If someone does not, kindly remind them to do so.
  - Make sure the head of the bed is always raised, and that mouth cleaning and suctioning are done regularly.
  - Ask how often they check to see if your loved one can breathe without the ventilator.
  - Ask when the breathing tube and ventilator are going to be removed.

If you have questions or concerns about your loved one's condition or care, talk with their nurses or healthcare providers. Keep a list of your questions so you won't forget what information you need. Most hospitals have patient advocate programs to help people and family members with problems.