

Noninvasive Versus Invasive Ventilation

A plain-English guide for you and your family

WHAT IS HAPPENING

Your lungs normally do two jobs every breath: pull oxygen in and push carbon dioxide (the body's waste gas) out. When lungs get sick — from a flare of COPD, pneumonia, fluid backup from heart failure, or other causes — they cannot swap gases well, so oxygen in the blood drops and CO₂ builds up. Your body tries to fix this by breathing faster and harder, but that burns energy fast and the breathing muscles get tired. At that point you need help. Doctors have two main ways to help you breathe. The gentler way is called NIV (noninvasive ventilation) — a snug mask on your face that blows air in under pressure to keep your airways open and make each breath easier. It works well if you are awake, can protect your own airway (cough and swallow safely), and your lungs can still heal with a little boost. The stronger way is invasive ventilation (intubation) — a plastic tube slid down your throat into your windpipe, connected to a machine that breathes for you completely. Doctors choose that when you are too sleepy to protect your airway, so tired you are about to stop breathing, or your lungs are so damaged they need full machine control to rest and heal. The choice depends on what caused the problem, how awake and strong you are, and whether the mask is enough or the tube is safer. Both are bridges to let your lungs heal; the goal is always to get you breathing on your own again as soon as it is safe.

What you might feel

- Working hard to breathe — fast breathing, using neck and belly muscles to pull air in, flaring nostrils
- Low oxygen level on the monitor (SpO₂ below 90% even with extra oxygen)
- Fast heart rate (over 100–120 beats per minute)
- Confusion, sleepiness, or trouble staying awake
- Very fast breathing (over 25–30 breaths per minute)
- Sweating and looking anxious or exhausted
- Speaking only in short bursts or single words instead of full sentences
- Blue or gray color to the lips, fingernails, or skin (cyanosis)

Call the doctor right away if...

- Person stops breathing, gasps for air, or suddenly becomes unresponsive
- Oxygen level stays below 88-90% even with high-flow oxygen or noninvasive support
- Blood pressure drops sharply or heart rate climbs above 130-140
- Confusion or sleepiness gets worse — cannot follow simple commands or keep eyes open
- Breathing gets slower and shallower instead of faster (a sign the muscles are giving out)

What the care team will do

- Assess mental status and ability to follow commands every 15 to 30 minutes
- Monitor respiratory rate, oxygen saturation, and work of breathing continuously
- Position the patient sitting upright at 45 to 90 degrees
- Ensure proper NIV mask fit and check for skin breakdown on the nose and face every 2 hours
- Keep suction and intubation equipment at the bedside and ready to use
- Titrate oxygen to maintain SpO₂ 88 to 92 percent in COPD patients and 94 to 98 percent in others
- Administer prescribed bronchodilators, diuretics, or antibiotics on time
- Communicate frequently with the patient and reassure them during NIV therapy

Medicines you may be given — and why

Non-Invasive Ventilation (NIV) — BiPAP or CPAP

NIV blows pressurized air into the lungs through a tight-fitting mask so the patient does not have to work as hard to breathe. It pushes oxygen in and helps push carbon dioxide out. The pressure props open collapsed air sacs (alveoli) so gas exchange can happen. The patient stays awake, protects their own airway, and can take the mask off if needed.

Endotracheal Intubation with Invasive Mechanical Ventilation

A breathing tube is placed through the mouth into the trachea (windpipe) and connected to a ventilator machine. The machine takes over breathing completely. The patient is usually sedated. The tube seals the airway so the machine can deliver precise volumes of oxygen and pressure directly into the lungs, protect the airway from vomit or secretions, and allow suctioning of mucus.

High-Flow Nasal Cannula (HFNC)

HFNC delivers heated, humidified oxygen at very high flow rates (up to 60 liters per minute) through soft nasal prongs. The high flow creates a small amount of positive pressure in the upper airway, washes out carbon dioxide from the nose and throat (dead space), and delivers a precise, stable oxygen concentration. It is more comfortable than a mask and can deliver more oxygen than a standard nasal cannula.

Where this information comes from

- American Thoracic Society (ATS) Clinical Practice Guideline: Noninvasive Ventilation for Acute Respiratory Failure, 2017
- European Respiratory Society (ERS) / ATS Guidelines on NIV, 2017
- British Thoracic Society (BTS) / Intensive Care Society (ICS) Guideline for Ventilatory Support in Adults, 2016
- Cochrane Database: Noninvasive Ventilation for Acute Respiratory Failure

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