

# Breathe Easy

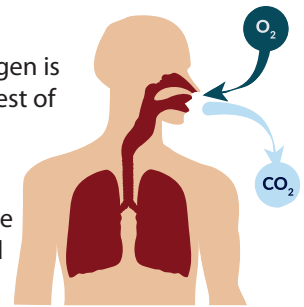
IMPROVING INADEQUATE BREATHING

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HEALTHCARE INC.

## YOUR LUNGS HAVE TWO PRIMARY JOBS.

The first is to get oxygen into the blood stream. As we breathe air into our lungs, it is rich in oxygen. Oxygen is transferred from the tiny air sacs in our lungs (called alveoli) into the blood and carried throughout the rest of the body.

The second function of the lungs is to get rid of the carbon dioxide. As our body creates energy for muscle movement and other body functions, it produces carbon dioxide. Carbon dioxide is carried by the blood back to the lungs where it is exhaled. If we were unable to get rid of carbon dioxide, it would build to dangerous levels and could even cause death.



## CHRONIC RESPIRATORY FAILURE

Many conditions that affect breathing can eventually lead to a state where the lungs are no longer ventilated well enough to clear the carbon dioxide from the body. This is a condition referred to as chronic respiratory failure.

Several conditions can lead to chronic respiratory failure. The most common is Chronic Obstructive Pulmonary Disease (COPD), which includes emphysema and chronic bronchitis. Neuromuscular diseases such as amyotrophic lateral sclerosis, muscular atrophy or dystrophy, post-polio syndrome, multiple sclerosis, spinal cord injuries, and myasthenia gravis can lead to chronic respiratory failure. Diseases that affect the movement of the chest cavity can also cause chronic respiratory failure such as kyphoscoliosis (abnormal curvature of the spine) and obesity hypoventilation syndrome (poor breathing due to severe obesity).

### SYMPTOMS OF CHRONIC RESPIRATORY FAILURE OR NOCTURNAL HYPOVENTILATION INCLUDE:

- Shortness of breath at rest or with activity
- Poor sleep quality
- Daytime fatigue or sleepiness
- Altered mental status or personality
- Confusion, reduced alertness, or forgetfulness
- Shortness of breath when lying down or waking up
- Morning headaches

Some patients may under ventilate just during sleep, a condition referred to as nocturnal hypoventilation. These patients may have poor sleep quality, be sleepy or fatigued during the day, wake up short of breath during the night, or experience morning headaches.

Patients with these conditions may benefit from a therapy called Non-Invasive Ventilation, or NIV. NIV can be used at night or during the day. A small mask is placed over the nose and is connected to a device that senses the patient's breathing. During inhalation, the machine provides a "pressure boost" through the mask which causes the patient to breathe deeper and more effectively while decreasing the work of breathing. The device also applies a low pressure during exhalation, which helps to keep the airways open and get rid of more stale air that is normally trapped in the lungs. If the patient stops breathing for a period of time, the machine will also automatically deliver a breath.

NIV provides more effective ventilation of the lungs. This can decrease excess carbon dioxide, increase oxygen levels, improve sleep quality, decrease symptoms (shortness of breath, daytime fatigue, morning headaches, etc.) and improve overall quality of life.

Several clinical studies have demonstrated the potential benefits of NIV. Improvements include:

- Improved oxygen and carbon dioxide levels and exercise capacity
- Improved nighttime oxygen levels, symptoms and function
- Decreased risk of death
- Decreased hospitalizations
- Reduced air trapping in the lungs
- Improved patient quality of life