

What is paradoxical breathing?

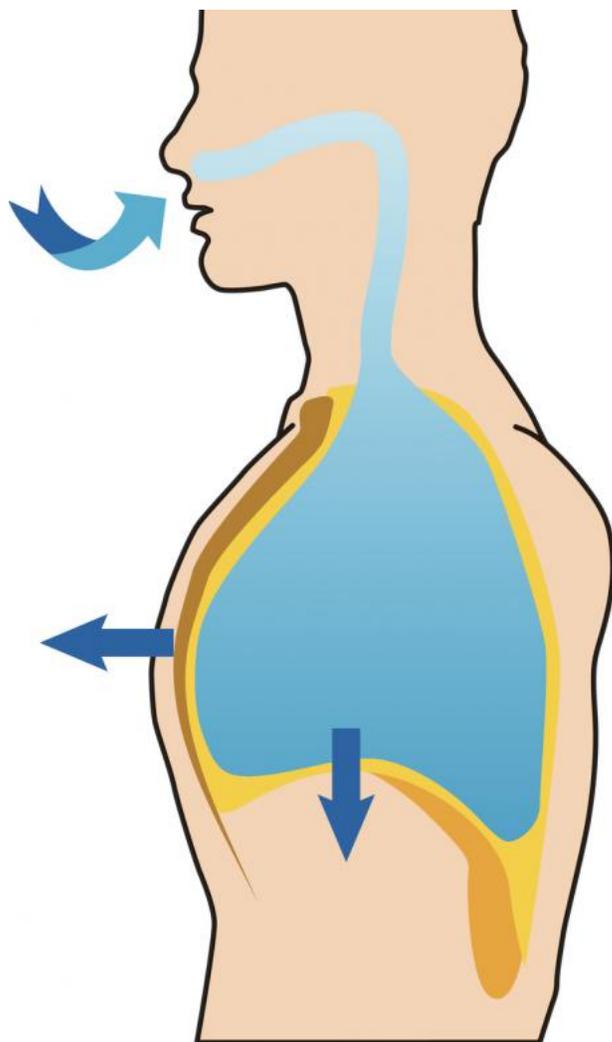
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Paradoxical breathing is often a sign of breathing problems. It causes the chest to contract during inhaling and to expand during exhaling, the opposite of how it should move.

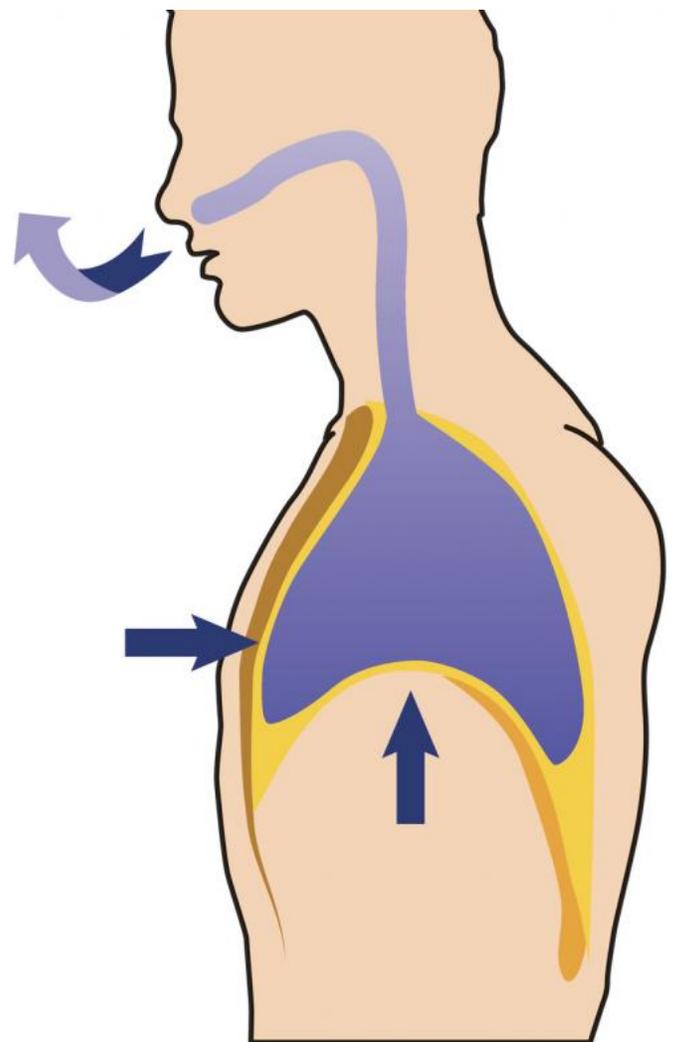
In this article, we look at the causes and symptoms of paradoxical breathing, as well as how to identify signs of this condition in infants.

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Breath



Exhalation

During inspiration the diaphragm pulls down and during expiration the diaphragm pulls up. The reverse of this pattern is called paradoxical breathing.

The way breathing looks and feels depends on the movements of the diaphragm and lungs.

The diaphragm is the primary muscle that controls breathing. During inspiration — the technical term for inhaling — the diaphragm pulls down, making more room in the chest for the lungs to expand with air. This makes the chest appear to grow larger.

During expiration — the technical term for exhaling air — the diaphragm moves up, pushing air out of the lungs and causing the chest to contract.

Paradoxical breathing reverses this pattern, which means that during inspiration, the chest contracts, and during expiration, it expands.

Paradoxical breathing is usually accompanied by unusual movements in the abdomen, which may also move in when a person inhales and out when they exhale.

Paradoxical breathing can be normal in infants, but in children and adults it is often a symptom of an underlying medical condition. If accompanied by breathing difficulties, paradoxical breathing is a medical emergency.

Symptoms

The primary symptom of paradoxical breathing is a change in the pattern of breathing. To test for paradoxical breathing, a person can lie on their back and take a deep breath.

The chest and abdomen should expand when they inhale and contract when they exhale. If the chest and abdomen expand while inhaling and contract while breathing out, a person may have paradoxical breathing.

Sometimes paradoxical breathing is accompanied by other symptoms, including:

- dizziness and weakness
- difficulty catching the breath
- being unable to take a deep breath
- having a rapid heart rate
- pain, tension, or weakness in the chest or stomach

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Causes



An injury to the chest may cause paradoxical breathing.

Except in [infants and children younger than two and a half](#), paradoxical breathing points to a problem with the lungs or diaphragm. The most common causes of paradoxical breathing include:

Injury to the chest

Trauma to the chest, such as from a fall, a sports injury, or a car accident, can damage the lungs and rib cage. This trauma may cause the lungs to expand while exhaling, but not when inhaling.

When paradoxical breathing is caused by trauma, it usually begins immediately following the incident and requires emergency treatment.

Neurological problems

Some neurological disorders can paralyze the diaphragm. When the diaphragm cannot move, the lungs do not expand properly when inhaling.

Neurological disorders can also disrupt signals to and from the diaphragm and lungs, causing breathing malfunctions.

Electrolyte imbalances

Severe [malnutrition](#), vomiting, [diarrhea](#), and some metabolic disorders can cause imbalances in the body's electrolytes. This may cause respiratory problems, including paradoxical breathing as the body tries to compensate

for the metabolic disturbance.

Hormonal shifts

Hormones are the body's chemical messengers. They convey essential information to virtually every part of the body, including the respiratory system. Hormonal imbalances may change breathing patterns and cause paradoxical breathing.

Muscle dysfunction

If the diaphragm cannot function correctly, it may not be able to move to allow the lungs to expand fully. This can cause difficulty breathing and may cause the lungs to only partially expand when a person takes a breath. Damage to the diaphragm due to trauma and neurological problems, such as [multiple sclerosis](#), may also be the cause of a diaphragm malfunction.

Upper airway blockage

When something blocks the upper airway, including the nose, throat, and upper part of the windpipe, paradoxical breathing may occur. This can happen during an allergic reaction if the throat swells, if a person has a severe respiratory infection, or if someone is choking.

Sleep apnea

Sleep apnea is a sleep and respiratory disorder that causes a person to frequently stop breathing or take very shallow breaths during sleep. Both children and adults experiencing sleep apnea may show signs of paradoxical breathing.

[Sleep apnea: Treatments, causes, and symptoms](#)

[Sleep apnea is a common sleep disorder in which an individual's breathing repeatedly stops and starts during sleep. Learn more.](#)

[Read now](#)

Paradoxical breathing in infants and children

Infants' chests may contract when they inhale. This is normal as long as the stomach expands.

The lungs and chest are not fully developed in those under 2-3 years old. Because the chest moves more easily in infants, breathing can look different than it does in adults.

However, parents and caregivers should look for other signs of respiratory distress if they are concerned about their children's breathing. Coughing, shortness of breath, and complaints of difficulty breathing warrant calling a doctor.

Retracting is a medical emergency in infants and newborns. [Retracting occurs](#) when the skin sinks into the ribs during breathing as the body struggles to get enough air. This may also cause the chest to sink.

Other signs of breathing problems in infants include:

- grunting or wheezing
- repeatedly flaring the nostrils
- turning blue
- very rapid breathing

Diagnosis

Diagnosis of paradoxical breathing begins with a recent medical history. The doctor will ask questions about choking, recent injuries, allergies, and health changes that might explain the breathing difficulties.

Some other tests a doctor might use include:

- imaging tests, such as chest X-rays
- listening to the heart
- a vital capacity test, which measures how much air a person can release from their lungs
- blood tests to look for hormonal or electrolyte imbalances
- [ultrasounds](#) of the chest and surrounding structures

A person who is not getting enough oxygen requires emergency treatment before any diagnostic tests.

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Treatment



The use of an oxygen mask may be a recommended treatment for paradoxical breathing.

Treatment for paradoxical breathing will vary depending on the underlying cause. In some people, treatment might mean a comprehensive plan for a serious neurological or other disorder.

Other possible treatments include:

- use of an oxygen mask or another oxygen delivery system
- use of a tracheotomy, a breathing tube in the windpipe
- medication for any underlying medical conditions
- replacing lost electrolytes with intravenous (IV) fluids
- repairing damage to the chest or diaphragm
- treatment for sleep apnea, which may include weight loss or the use of a breathing support machine at night
- treating and removing any blockages in the airway
- monitoring in a hospital setting if the cause of the paradoxical breathing is unclear

Outlook

Paradoxical breathing ranges from a temporary symptom in young infants to a potentially life-threatening symptom in people experiencing paralysis of the diaphragm or a serious injury.

This breathing pattern alone cannot diagnose a medical condition, so it is important to seek prompt medical treatment and provide an accurate medical history. With the correct diagnosis, paradoxical breathing can be treated with the appropriate medical interventions.