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Shortness of Breath

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Difficulty in breathing (also known as shortness of breath, breathlessness, or dyspnea) is caused by various mechanisms related to different problems in the body. In one's lifetime, one may experience rare episodes of shortness of breath as part of high levels of activity like exhaustive exertion, or during environmental conditions such as high altitude or very warm or cold temperatures. Other than these extreme conditions, shortness of breath is commonly a sign of a medical problem.

When Is Shortness of Breath a Sign of a Medical Problem?

If the shortness of breath is prolonged and persistent, it is likely to be related to a medical condition. If it is sudden and severe in intensity, even if it is of short duration, however, it may warrant medical evaluation. The following are other clues of existence of a medical problem.

- Shortness of breath at rest
- Shortness of breath with activity or exercise
- Shortness of breath when lying down
- Shortness of breath on exposure to allergens or provoking agents

- Shortness of breath accompanied with:
 - Chest pain or chest discomfort
 - Discomfort or pain in 1 or both arms, pain radiating to jaw, or pain in the neck
 - Swelling in ankles and feet
 - Fluid weight gain or unintentional weight loss with loss of appetite
 - Unusual fatigue
 - Sweating
 - Yellow, green, or rusty colored sputum or phlegm or blood in the sputum
 - Fever
 - Wheezing or whistle-like sounds with breathing
 - Persistent, chronic cough
 - Blue discoloration of lips or fingertips
 - Fainting, dizzy spells, lightheadedness
 - Club-shaped deformation of fingertips

What Causes Shortness of Breath?

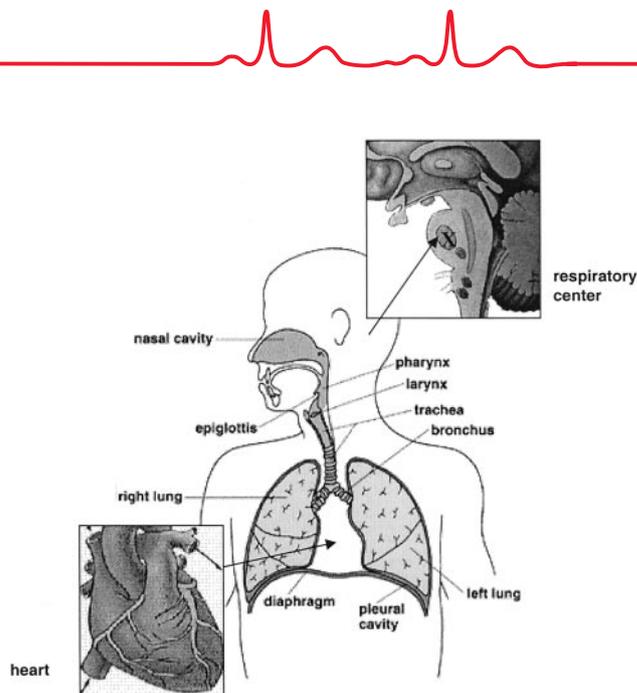
Symptom of shortness of breath can be caused by a variety of abnormalities in different organ systems in the body (Figure).

Lung Problems

- Recent infections, such as bronchitis or pneumonia, or prolonged (chron-

- ic) infections, such as tuberculosis or chronic bronchitis. Shortness of breath may be accompanied by discolored phlegm and/or fever.
- Asthma, chronic obstructive lung disease (COPD), and emphysema: The airways are narrowed with increased resistance to exhaling air from the lung, resulting in air entrapment in the lung. Shortness of breath may be accompanied by wheezing. With asthma, there is usually an allergy history, whereas with COPD or emphysema, there is usually a smoking history.
- Lung cancer and other tumors: Shortness of breath is commonly accompanied by unintentional appetite and weight loss. There is usually a long history of heavy smoking.
- Scarring and damage of lung tissue by toxins (such as asbestosis) or by systemic illnesses (such as rheumatoid arthritis). There is usually a known history of these systemic illnesses or occupational exposures.
- Clot in the lung circulation (pulmonary embolus): Breathlessness is usually sudden and associated with rapid breathing and may be accompanied by chest pain. People with blood clots in the legs or pelvis (deep vein thrombosis, or DVT), debilitating medical conditions, immobility, or inherited tendency of

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Organs that may be involved in development of shortness of breath. The X in the upper inset box indicates the location of the respiratory center.

forming clots may be prone to this condition (for more information about pulmonary embolism, see the Cardiology Patient Page by Goldhaber and Morrisson. Pulmonary embolism and deep vein thrombosis. *Circulation*. 2002;106:1436–1438).

- Diseases of the lung sac (pleura): If the pleura thickens, becomes scarred, or gets filled with fluid or blood because of infection (pleurisy), cancer, or toxins (asbestosis), or if it becomes filled with air (called pneumothorax) because of trauma, it will hinder expansion of the lung, resulting in shortness of breath.
- Diseases of the diaphragm and/or chest wall: The diaphragm is the muscle that expands the lung. It may become paralyzed after chest surgery. Obesity and spine or chest wall deformities also can produce difficulty in breathing.

Heart Problems

- Heart Failure: The shortness of breath in heart failure is caused by the decreased ability of the heart to fill and empty, producing elevated pressures in the blood vessels

around the lung. Common symptoms of heart failure are difficulty in breathing when lying down (this is a specific symptom of heart failure), necessity of propping up the head of the bed with many pillows, wakefulness at night with shortness of breath, cough at night or when lying down, shortness of breath with activity, swelling of ankles or legs, unusual fatigue with activity, and fluid weight gain.

The cause of heart failure is usually damage to the heart muscle. In the majority of patients, this is caused by a heart attack (coronary artery disease). In some, it is caused by leakage or narrowing of the heart valves (in this condition, the doctor will report hearing a murmur), weakening of the heart muscle caused by toxins (such as alcohol or cocaine), viral infections, hereditary factors, or unknown factors.

Systemic Illness Problems

- Anemia, low red blood cell count: Because the red cells carry oxygen, when their number is extremely low, the oxygen demands of the body

will not be met, resulting in shortness of breath.

- Increased metabolic states such as high thyroid level, shock (extremely low blood pressure), severe systemic infection (sepsis), or fever: The increased oxygen demands of the body will try to be met by breathing heavily and rapidly.
- Kidney or chronic liver problems: Because of increased fluid in the lungs and body and impaired oxygen exchange in the lungs, patients may experience shortness of breath in the advanced stages of both conditions.

Nervous System Problems

- Increased pressure in the brain caused by trauma, tumors, stroke, or bleeding. When the portion of the brain that regulates respiration is affected, these rare conditions may result in difficulty in breathing. Other neurological symptoms usually precede shortness of breath.
- Nerve and muscle disorders that affect the ability to coordinate and expand the chest and that affect movement of the diaphragm may produce difficulty in breathing.
- Anxiety disorder: Anxiety is sometimes accompanied by heavy and rapid breathing (hyperventilation). Shortness of breath usually resolves once the anxiety episode ends.

How Is Shortness of Breath Evaluated?

Your doctor will perform a thorough physical examination and obtain a chest x-ray. If heart disease is suspected, you may undergo an ECG, echocardiogram, or nuclear scan of the heart to measure its pumping function and/or a stress test to evaluate possible blockages in the vessels feeding the heart (coronary artery disease). If lung disease is suspected, you may undergo a lung function study (spirometry or PFT). Occasionally, an exercise test



(cardiopulmonary exercise test) may be conducted on a treadmill or a bike to measure lung gas exchange, physical fitness, and heart function. Additional testing, such as a CT (computerized tomography) scan, may be required in some cases.

How Is Shortness of Breath Treated?

The type of treatment depends on the underlying cause. If you are diagnosed with heart failure, you may be treated with medications such as fluid pills (diuretics), angiotensin-converting enzyme inhibitors, digoxin, and beta-blockers. If asthma or chronic lung disease is the cause, you may be treated with medications that reduce the spasm or inflammation of the airways or with oxygen. For infection, you may be prescribed an antibiotic.

WHAT CAN I DO TO TAKE CARE OF MYSELF?

- Quit smoking. Cessation of smoking will help to relieve some of your symptoms and to reduce your risk for lung cancer.
- Avoid exposure to allergens, dust, and toxic substances. If you are an asthmatic, avoid exposure to the allergens that cause shortness of breath.
- Avoid becoming overweight and exercise regularly. Always consult your physician before beginning a weight loss or exercise program.
- If you have heart failure, take your medications regularly, avoid salt intake, and weigh yourself daily to monitor fluid status.

Continued

- Learn about your medical condition. Talk with your health-care provider to learn about methods to alleviate or resolve shortness of breath. Develop an action plan for worsening symptoms.

Additional Resources

American Thoracic Society. Consensus statement on dyspnea. Available at: <http://www.olivija.com/dyspnea/>. Accessed June 13, 2003.

American Academy of Family Physicians. Diagnostic evaluation of dyspnea. Available at: <http://www.aafp.org/afp/980215ap/morgan.html>. Accessed June 13, 2003.