# Surgical repair of phrenic nerve injury improves breathing

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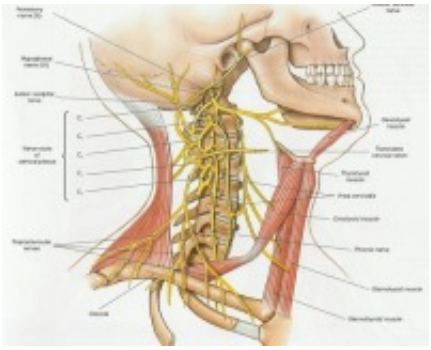


Credit: University of California, Los Angeles

A study led by UCLA researchers found that in people with breathing difficulties caused by phrenic nerve injury surgical reconstruction of the nerve can lead to significant improvement in breathing and an increase in regular physical activities.

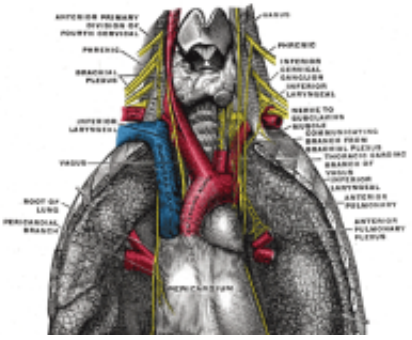
The phrenic nerve controls voluntary and involuntary breathing, such as during sleep, by transmitting signals from the brain and spinal cord to the esophagus. The signal originates in the C-3 through C-5 cervical spinal roots in the neck, and then travels through the chest between the heart and lungs to the diaphragm, which is the primary muscle involved in breathing. The nerve's signals cause the diaphragm to contract, resulting in expansion of the chest cavity and inhalation of air into the lungs.

Individuals with phrenic nerve injury experience difficulty breathing and, depending on the severity of the injury, may become winded after climbing a flight of stairs or even tying their shoes. For some, difficulty in breathing while lying down can interfere with sleep, causing insomnia. Symptoms can include lethargy, headaches and blue-tinged lips or fingers. Some people develop the injury after a major operation such as neck dissection for head and neck cancer, lung surgery, coronary bypass surgery, heart valve or other vascular surgery and thymus gland surgery. After the surgery, sometimes scar tissue forms in the neck, which compresses the nerve. Injuries can also result from epidural injections or other types of nerve blocks, as well as chiropractic manipulation of the neck, which can disturb the roots of the spinal nerves.

The researchers report there are 5,000 to 10,000 new cases each year, according to conservative estimates.

Researchers followed 180 people treated with phrenic nerve reconstruction for chronic paralysis of the diaphragm for a median of 2.7 years, assessing their physical function and reported outcomes.

Eighty-nine percent of those in the study reported an overall improvement in breathing function. The findings demonstrate the efficacy of the surgery in a large cohort of patients.



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**More information:** Matthew Kaufman et al. Long-Term Follow-Up after Phrenic Nerve Reconstruction for Diaphragmatic Paralysis: A Review of 180 Patients, *Journal of Reconstructive Microsurgery* (2016). DOI: 10.1055/s-0036-1588018