American Thoracic Society

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Exercise-induced Laryngeal Obstruction

Exercise-induced laryngeal obstruction (EILO) is a breathing problem that affects people during exercise. EILO is defined by inappropriate narrowing of the upper airway at the level of the vocal cords (glottis) and/or supraglottis (above the vocal cords). This can make it hard to get air into your lungs during exercise and cause a noisy breathing that can be frightening. EILO has also been called vocal cord dysfunction (VCD) or paradoxical vocal fold motion (PVFM).

Most people with EILO only have symptoms when they exercise, those some people may have the problem at other times as well. (See ATS Patient Information Series fact sheet 'Inducible Laryngeal Obstruction/Vocal Cord Dysfunction')

Where are the vocal cords and what do they do?

Your vocal cords are located in your upper airway or larynx. Your supraglottic structures (including your arytenoid cartilages and epiglottis) are located above the vocal cords and are part of your larynx. The larynx is often called the voice box and is deep in your throat. When you speak, the vocal cords vibrate as you breathe out, allowing you to produce sound. When you swallow, the vocal cords close and the supraglottic structures cover your airway to prevent aspiration. When you breathe in and out, the vocal cords (and structures above) should remain open, allowing air to flow in and out of your windpipe (trachea) and lungs. When you exercise, the vocal cords (and structures above) should open wider to promote airflow. When you have EILO, the larynx may do the opposite and close limiting your ability to take a breath in.

Who gets EILO?

EILO is a common condition in both females and males. It is most often seen in adolescent and young adult athletes, but it can certainly occur in preteens and adults as well. People with EILO may share similar personality features, including being very competitive or driven to perfection.

Common signs and symptoms of EILO

During (or immediately after) high-intensity exercise, with EILO you may experience:

- Profound shortness of breath or breathlessness
- Noisy breathing, particularly when breathing in (stridor, gasping, raspy sounds, or "wheezing")
- A feeling of choking or suffocation that can be scary
- Feeling like there is a lump in the throat
- Throat or chest tightness

These symptoms often come on suddenly during exercise, and are typically quite noticeable or concerning to people around you as well. The symptoms often resolve within minutes after you stop exercising.

EILO is often confused with asthma

Many people with EILO are first thought to have exercise-induced asthma. However, asthma medicines (such as albuterol) will not be effective for EILO. It is possible to have both asthma and EILO, and it can be difficult at first to figure out which problem is causing the symptoms. Try to take a video when you are having symptoms to show your healthcare provider. The video may offer some visual or auditory clues that fit best with one or both problems.

How do I know if I have EILO?

The best way to diagnose EILO is a test called continuous laryngoscopy during exercise. During this test, a healthcare provider will look at your vocal cords (and structures above) while you are exercising. A small, flexible tube with a camera (laryngoscope) is passed through

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your nose to the back of your throat in order to view your vocal cords (and supraglottis). Before putting in the scope, medicine is put in your nose to open and numb your nasal passages. Once in place, the scope is attached to a helmet you will wear to secure it during exercise. You will then exercise, often on a bicycle or treadmill, until you develop the typical symptoms you have during sports or exercise. At that time, your healthcare provider will be able to see if your airway is narrowing at (or above) the level of the vocal cords. The exercise portion of the test typically lasts about 8-to-12 minutes. The scope is removed once you stop exercising and recover from your symptoms.

Sometimes the exercise portion (also called an exercise challenge test) will be done and if you develop symptoms, a laryngoscopy is done right after you stop exercising.

In order to diagnose (or rule out) asthma, your healthcare provider may have you do lung function testing (spirometry) and/or a challenge test to bring on asthma signs or symptoms with exercise or medicines such as methacholine. Bronchospasm, a defining feature of asthma, occurs when the muscles that surround the airways in the lungs tighten around them. A challenge test may be done with inhaled methacholine or exercise. (For more information see ATS Patient Information Series fact sheet "Challenge Tests")

How is EILO treated?

EILO is treated differently than many other breathing problems because there are no medications that effectively control or prevent symptoms. The main treatment for EILO involves learning one or more breathing techniques to help manage symptoms. A speech therapist or psychologist who is experienced in treating patients with EILO can perform speech-behavioral therapy.

The breathing techniques will help you open your airway and relax your throat, neck, and shoulders while you are exercising. You may have to meet with a therapist at least 3 times to learn these techniques. It can be helpful to find ways to reduce your overall stress level to try to relax and stay calm. If you also have asthma, you should continue taking your asthma medications while being treated for EILO.

If you have also have post-nasal drip or acid reflux, your healthcare provider may recommend medications to treat these conditions, as both can irritate your upper airway.

What if I am not getting better with speech-behavioral therapy?

If you are not improving with therapy, first, it is important to:

- Make sure that EILO is the correct diagnosis.
- Adequately treat other conditions you may have in addition to EILO.

Specialized centers can use real-time laryngoscopy during exercise to teach you what is happening in your larynx and help you control or prevent upper airway obstruction using visual biofeedback. During these sessions, you will be asked to exercise to provoke symptoms. You will learn specific techniques to keep your airway open during exercise and practice them. On average, 2 to 4 sessions are needed for a person to get the most improvement.

Authors: Elizabeth Fan, PA-C, J. Tod Olin, MD, MSCS
Reviewers: Marianna Sockrider MD, DrPH

Rx *Action Steps*

- ✔ If you or your healthcare provider think that you may have EILO, ask to see an EILO specialist.
- ✔ Learn the breathing techniques to control and prevent EILO and practice them regularly.
- ✔ It can be helpful to find ways to reduce your overall stress level—relax, and stay calm even during periods of stress.
- ✔ If you have asthma, postnasal drip, or acid reflux, take your medicines regularly and make sure these problems are well-controlled.

Healthcare Provider's Contact Number:

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For More Information

American Thoracic Society

- www.thoracic.org/patients/
  - ILO/VCD
  - Lung function testing
  - Challenge testing

National Jewish Health

- https://www.nationaljewish.org/education-training/patient-education/print-multimedia/online-materials/exercise-induced-laryngeal-obstruction-eilo

UpToDate

- https://www.uptodate.com/contents/exercise-induced-laryngeal-obstruction

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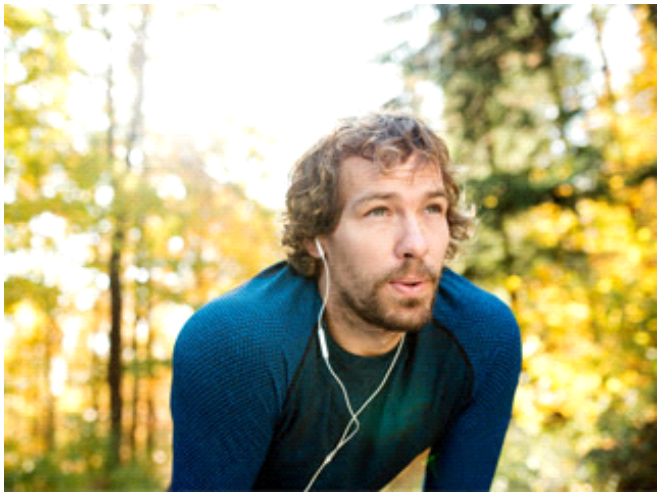
Exercise-Induced Laryngeal Obstruction (EILO)

In 1983, doctors at National Jewish described a condition that may mimic asthma. This condition is called **vocal cord dysfunction**. A few years later, a similar condition occurring primarily during exercise was described. Today, this variant of vocal cord dysfunction is known as exercise-induced laryngeal obstruction (EILO).



What are the symptoms of EILO?

Symptoms of EILO can include:

- Shortness of breath during high-intensity exercise
- Stridor (noisy breathing) during exercise
- Frightening difficult breathing
- Chest and/or throat tightness
- “Just having trouble getting air in.”

What happens with EILO?

To understand EILO, it is helpful to understand how the vocal cords function. The vocal cords are located at the top of the windpipe (trachea) and vibrate to produce noise and voice. Breathing during exercise causes the vocal cords to open, allowing air to flow through the windpipe (trachea) and into the lungs. During episodes of EILO, the vocal cords constrict partially. This leaves a restricted opening for air to flow through the windpipe and causes shortness of breath. Although it is frequent confused with asthma, it is a completely separate problem.

What can trigger EILO symptoms?

Usually EILO is triggered only during high-intensity exercise. Some people can experience similar symptoms at other times (including low-intensity exercise and during exposure to irritating smells).

How is EILO diagnosed?

Making a diagnosis of EILO can be **very** difficult. If your doctor suspects EILO, you will be asked many questions about your symptoms. Breathing tests like spirometry can be useful in diagnosing EILO, but only if they are done when symptoms are occurring. They are also helpful in the search for other explanations of symptoms. Laryngoscopy can be useful in diagnosing VCD and EILO, but generally only if it is done when symptoms are occurring. It is now possible to perform laryngoscopy simultaneous to the introduction of triggers that are specifically problematic to someone. National Jewish Health is one of a few centers in the world that can readily perform **continuous laryngoscopy during exercise**, a procedure which enables the visualization of the upper airway during intense exercise. This test is the most advanced test used in the evaluation of EILO.

How is EILO treated?

Once diagnosed with EILO, a specific treatment program can begin. There are special exercises and therapies that help control symptoms.

- Speech therapy is a very important part of the treatment for EILO. In speech therapy you will learn exercises to increase your awareness of abdominal breathing and relax your throat muscles. This enables you to have more control over your vocal cords and throat. The medical team will treat other conditions with medications (allergies, asthma, etc.). Since EILO is a separate diagnosis from asthma, its symptoms do not improve or only minimally improve with asthma medications alone.

- Another important part of treatment is supportive counseling or performance psychology, which can help you identify and deal positively with stress that may be an underlying factor in EILO.

Visit our website for more information about support groups, clinical trials and lifestyle information.

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