As a sports health care professional, you probably encounter many athletes with exercise-induced asthma (EIA). Asthma is a common disorder that affects 5 to 10% of the population, athletes and non-athletes alike. People with asthma develop reversible lower airway obstruction following a variety of stimuli including allergens, viral infections, irritants, and exercise.

Exercise is the most common trigger of asthmatic symptoms. When the exercise is sufficiently intense, virtually all individuals with asthma experience coughing, wheezing, shortness of breath, or tightness in the chest. In some, exercise may be the only provoker of these symptoms, and EIA is often unrecognized and sometimes confused with the normal sensation of breathlessness that accompanies exercise.

People with asthma have often been advised to restrict their physical activities in order to prevent bronchospasm (narrowing of the airway) and the accompanying symptoms. However, with improved recognition, understanding, and treatment of EIA, participation in athletics need not be limited.

Asthmatics can even participate in highly competitive activities. For instance, 67 (11%) of the 1984 U.S. Summer Olympic Team members had EIA, but that didn't stop them from winning a total of 41 medals, including 15 gold medals (Voy, 1984). According to more recent surveys, some 12 to 23% of high school and college athletes have EIA (Kumar & Busse, 1995). Fortunately, EIA alone is rarely severe enough to require hospitalization. Nonetheless, athletic performance is often limited if EIA goes unrecognized and untreated.

Diagnosis of EIA

EIA should be suspected in individuals who have a personal or family history of asthma or hay fever, and who have coughing, wheezing, chest tightness, or shortness of breath during or after exercise.

In some cases coughing is the only sign of EIA. Other more subtle indicators of possible EIA include "not keeping up with others" during exercise, symptoms during running but not swimming, and exercise fatigue. Young athletes in particular may be reluctant to report EIA symptoms for fear of being considered different from their peers. Physical examination and lung function may be normal, especially at rest (Cypcar & Lemanske, 1994).

Pulmonary function testing showing reversible airflow obstruction, either at rest or after exercise, is consistent with asthma. If reversible airflow obstruction is demonstrated at rest, no further testing may be required. However, in many cases an exercise challenge test including measurement of lung function before and after exercise may help to establish the diagnosis of EIA. Some individuals with hay fever may also show airflow obstruction with exercise of sufficient intensity.

EIA is associated with characteristic changes in airway smooth muscle tone and airflow obstruction. During the first few minutes of exercise, bronchodilation occurs, followed by airway narrowing and maximal bronchoconstriction 5 to 10 min after exercise.

Although symptoms of EIA most commonly develop 5 to 10 min after exercise, they may begin during exercise. Some individuals can "run through" these symptoms, although this practice should be discouraged. The bronchoconstriction (and symptoms) then gradually resolve, usually completely by 30 to 60 min after cessation of exercise (McFadden & Gilbert, 1994).

Regular exercise alone does not improve lung function or decrease overall bronchial hyper responsiveness ("twitchy airways") in those with asthma; but improved physical conditioning can lead to improved exercise tolerance.
Monitoring Lung Function

Once the diagnosis of EIA has been made, a handheld peak flow meter can be useful for monitoring the need for and response to therapy. A peak flow meter measures the peak expiratory flow (PEF). If done properly, with maximum effort, the PEF correlates well with FEV₁ (forced expiratory volume in 1 sec), a standard indicator of the degree of airflow obstruction. PEF can also help to differentiate the normal sensation of breathlessness with exercise from actual bronchospasm.

For proper use of the peak flow meter, instruct the person to follow these steps (see Figure 1):

1. Do the test while standing, if possible.
2. Be sure the indicator needle is at the bottom of the scale.
3. Inhale as deeply as possible and seal your lips tightly around the mouthpiece.
4. Blow out as hard and as fast as you can into the mouthpiece.
5. Repeat the process twice more, recording the highest of the 3 values obtained.

Treatment of EIA

Three major goals of asthma therapy are to optimize baseline lung function, prevent acute asthma episodes, and normalize lifestyle. If baseline PEF indicates obstruction (<80% predicted for age, gender, ethnic origin, and height), the underlying asthma should be treated optimally.

Treatment is individualized and may require reducing exposure to environmental allergens, treating underlying infection such as sinusitis or viral infection, and instituting inhaled corticosteroids to reduce underlying airway inflammation and bronchial hyperresponsiveness. In general, exercise is less likely to provoke acute breathing difficulty if the underlying asthma is well controlled. Acute episodes of EIA usually can then be prevented through non-pharmacologic and/or pharmacologic means. A chart suggesting an approach to treatment is shown in Figure 2.

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Figure 1 Correct use of a peak flow meter.

Figure 2 A stepwise approach for the athlete with exercise induced asthma.