

by Reed Humphrey, Ph.D., P.T., FACSM

Shortness of Breath in Exercise

The declining fitness of younger—and heavier—Americans and the increasing prevalence of breathing problems among children and younger adults present a unique challenge for the exercise professional, appreciating when exercise-induced shortness of breath is due to deconditioning or an impairment associated with undiagnosed pulmonary pathology. When the client comes to the gym with a bronchodilator in hand, the answer is obvious. For a novice exerciser without a preexisting pulmonary diagnosis, interpretation of exercise-associated shortness of breath may be difficult. The ability of the health and fitness professional to differentiate between deconditioning and a pathological breathing impairment is useful in helping their clients appreciate the real or perceived boundaries imposed by breathing difficulties. This ventilatory “skill set” is also vital, because unusual shortness of breath may not simply reflect a lung impairment but also may be a manifestation of an underlying cardiac problem, as shortness of breath is considered an anginal equivalent in lieu of more classic symptoms. The broader appreciation of the significance of shortness of breath heightens the need for a thorough understanding of this exercise-induced symptom in the context of chronic disease as well as deconditioning.

Considering the most recent available data from the National Center for Health Statistics and the American Lung Association (1), some 20 million Americans were diagnosed with asthma in 2003. Approximately 6 million of these cases were children,



and the greatest prevalence was seen in children younger than 18 years. Females were 35% more likely to have asthma overall than males, and, strikingly, the rate was observed to be 77% greater in females older than 18 years. Blacks are 39% more likely to have asthma than whites, whereas Hispanic Americans had about the same prevalence as whites. Most experts attribute the increase in asthma prevalence to increased exposure to stimuli known to exacerbate asthma attacks, including pollens, air pollutants, and, yes, physical activity. Importantly, the prevalence rate for asthma has been steadily increasing during the last decade, and of special relevance to exercise, nearly 90% of those with diagnosed asthma are likely to have exercise-induced events (2).

The presumption that exercise-induced bronchospasm (EIB), formerly but still referred to in some quarters as exercise-induced asthma, is

well diagnosed and managed is not supported in the literature. LaCroix (3), in an excellent and comprehensive review of assessment and management of EIB, notes that avoidance of exertion misleads parents and educators from observing symptoms. Although EIB prevalence varies between sports, several sources indicate that EIB can range up to 50% even in elite athletes (4, 5). Mayers and Rundell (5) suggest a prevalence of 10% to 15% in the general population, although exposure to cold weather markedly increases the prevalence, so the geographic location and the nature of exercise obviously influence EIB. For exercisers with diagnosed EIB, bronchodilators are frequently prescribed. Health and fitness professionals should be knowledgeable of the effects of bronchodilators on heart rate and blood pressure responses, which vary depending on the specific medicine used. Sympathomimetic agents,

including salmeterol xinafoate (Serevent), albuterol (Proventil), and fluticasone propionate/salmeterol (Advair), may elevate heart rate while decreasing blood pressure, influencing the exercise response (6). It should be noted that although bronchodilators are frequently prescribed, other medicines, including anti-inflammatory agents, antihistamines, calcium-channel blockers, and leukotriene inhibitors, are being used to treat EIB.

Oftentimes, exercisers feel that they are limited by their breathing when, in many cases, it is simply deconditioning. It is well established that lung volumes and capacities are not limiting factors in the absence of pathology, even at maximum exercise. When clients complain of being “winded” during exercise, a logical series of queries should help identify the source of the complaint:

- Do you have a history of breathing problems with activity?
- Would you consider your shortness of breath to be unusual given this level of exertion?
- Are you currently being or have you in the past been treated for any heart or lung problems?
- Are you on any medications to help with your breathing?

The associated measures should of course include a check of vital signs, including pulse and blood pressure, and, if possible, a measure of the client’s exercise heart rate at the time of their breathing limitation. Exercise testing protocols have been established to challenge EIB, and these generally include exercise bouts of five to eight minutes near the lactate threshold or, alternately, 70% to 85% of maximal

heart rate (5). If the health/fitness professional has access to and is qualified to assess basic spirometry, a quick screen of forced vital capacity and the forced expiratory volume can provide important insights. The results can be used to reassure clients that their breathing is more likely the result of the increased exertion more than a limitation to more exercise, and a modification of exercise intensity to alleviate the breathing stressors will lead to a more optimized fitness program.

For those with diagnosed EIB, exercise below the lactate/ventilatory threshold is logical, given the exercise challenge test for EIB, but this is problematic for those training with performance objectives, so use of prescribed medication may be necessary in combination with attempts to reduce bronchial tree irritants (pollution, pollen, and cold/dry air) as feasible from the exercise environment. It is important to note that approximately half of those with EIB will experience a refractory period of up to two hours after an attack, and asthma symptoms may occur six to eight hours after initial attack but are generally mild (5).

Given the upward trends in prevalence of EIB and increasing public awareness of asthma, the ability to differentially assess both EIB and the shortness of breath associated with low fitness is a fundamental skill for health fitness professionals. Knowledge of EIB, medication effects, and how to help clients manage the ventilatory response to exercise can significantly assist in achieving optimal exercise outcomes.



Reed H. Humphrey, Ph.D., P.T., FACSM, is professor and chair of the School of Physical Therapy & Rehabilitation Science at The University

of Montana. He completed a 4-year term as head of the World Council for Cardiovascular and Pulmonary Rehabilitation in 2004 and is a past president of the American Association of Cardiovascular & Pulmonary Rehabilitation. He is associate editor of ACSM’s Resources for Clinical Exercise Physiology and past associate editor of ACSM’s Guidelines for Exercise Testing and Prescription, fifth edition. Humphrey currently serves as an associate editor for ACSM’s Health and Fitness Journal[®].

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