both dry air and cold humidification; cold humidification again did not differ in this respect from dry air. The symptoms of dry mouth/throat/nose demonstrated the most significance. Heated humidification was preferred by 76% of patients over cold humidification.

In summary, the available data support the following conclusions: (1) a large proportion of CPAP users complain of nasal and oral symptoms, but no conclusive proof is available that patients with poor compliance have more of these symptoms than those with better compliance; (2) credible mechanisms exist by which CPAP could induce nasal and oral symptoms; (3) heated humidification improves the rH of CPAP air more reliably than cold humidification, particularly in the presence of a mouth leak, while a full face mask also performs well but is poorly tolerated; and (4) outcome studies have been performed that support the use of heated humidification over dry or cold humidified air, but only one study has thus far been published in a peer-reviewed journal. For clinicians dealing with the issue of poor compliance with nasal CPAP on a daily basis, these data are sufficiently compelling to justify the prescribing of heated humidification for patients complaining of nasal/oral symptoms, particularly when nasal corticosteroids and a chin strap are not effective. Consideration should also be given to a full face mask for the minority of patients able to tolerate this type of interface. As our dermatology colleagues have been teaching us for years, “if it’s dry, wet it.”

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Lee K. Brown, MD, FCCP
Albuquerque, NM

Dr. Brown is Medical Director, New Mexico Center for Sleep Medicine, and Associate Medical Director (Medical Specialties), Lovelace Health Systems, Inc., Albuquerque, NM; and Clinical Professor of Medicine, Division of Pulmonary, Critical Care, and Allergy, University of New Mexico School of Medicine, Albuquerque, NM.

Correspondence to: Lee K. Brown, MD, FCCP, Clinical Professor of Medicine, University of New Mexico School of Medicine, Medical Director, New Mexico Center for Sleep Medicine, Associate Medical Director (Medical Specialties), Lovelace Health Systems Inc., 4700 Jefferez Blvd NE, Suite 800, Albuquerque, NM 87109; e-mail: lkbrown@alum.mit.edu

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Why Do Girls Use Less Oxygen During Exercise Than Boys?

Cause or Effect of Decreased Work?

All aerobic energy-producing reactions in the body depend on oxygen; therefore, an indirect estimation of energy production can be obtained by using an individual’s oxygen consumption (VO2). In 1923, Hill and Lupton4 reported that each person has a maximal level of oxygen consumption (VO2max) that equals maximum aerobic power. The measurement of VO2max uses a progressive incremental exercise test, usually performed on a treadmill or cycle ergometer to a point where further increments of work are theoretically accompanied by a plateau of VO2. High VO2max values are important because
they reflect good function of the cardiovascular system. At the work rate corresponding to \( \text{V}_{2\text{max}} \), additional work is limited, and the muscle and blood lactate acid concentrations accelerate. This acceleration signals a rapid increase in the anaerobic metabolism during exercise and has been termed the anaerobic threshold. The \( \text{VO}_{2} \) at the anaerobic threshold correlates well with \( \text{V}_{2\text{max}} \) in children and may serve as an effective submaximal marker of aerobic fitness.\(^2\)

The \( \text{V}_{2\text{max}} \) for an individual, however, is subject to multiple variables that must be considered when comparing population studies. For example, \( \text{V}_{2\text{max}} \) obtained with a treadmill is higher than the \( \text{V}_{2\text{max}} \) obtained using a cycle ergometer. Individuals who are well motivated, coordinated, or physically trained perform better and will have a higher value for \( \text{V}_{2\text{max}} \). Performance is not exclusively related to \( \text{V}_{2\text{max}} \). If two athletes have the same value for \( \text{V}_{2\text{max}} \), the one with the lowest oxygen requirement during exercise will be a better performer.\(^3\) Two athletes may have the same performance, although their \( \text{V}_{2\text{max}} \) values are different. This means that the one with the lower \( \text{VO}_{2} \) is compensating with a higher efficiency. Economy of movement is thus a critical component of aerobic fitness.

Boys have a high \( \text{V}_{2\text{max}} \) when exercising if they are compared to girls. This difference is most noticeable if \( \text{V}_{2\text{max}} \) is expressed in L/min. The difference is less noticeable when \( \text{V}_{2\text{max}} \) is scaled to body weight and expressed as mL/kg/min. These gender differences are noticed even before puberty, but the magnitude of these differences nearly doubles after puberty.\(^4\) The reason for these gender differences has been widely studied. \( \text{V}_{2\text{max}} \) has been scaled in a variety of ways including body weight, lean body mass, surface area, skeletal age, exponents of height, hemoglobin concentration, and prior physical activity.\(^5\) In this issue of CHEST (see page 629), Rowland and colleagues demonstrated that differences in stroke volume as well as body composition contribute to the gender-related variations in \( \text{V}_{2\text{max}} \) during childhood. This observation adds yet another variable to the explanation of gender differences and \( \text{VO}_{2} \) in children. This study suggests that the delivery of oxygen to exercising muscle by the circulatory system may be a limitation to peak exercise performance and that this difference may be gender specific in prepubertal boys and girls.

The implications of this observation are intriguing. Will we in the future be measuring heart size or function as part of a fitness evaluation? Should children with congenital heart disease, pulmonary disease, or circulatory difficulties be viewed differently or perhaps tested differently than “normal children?” Is one’s ability to deliver oxygen to the exercising muscle trainable? Do two individuals with identical oxygen delivery systems, lean body mass, hemoglobin, daily physical activity, efficiency during exercise, and motivation have identical \( \text{V}_{2\text{max}} \) values regardless of gender. If so, then are we simply scaling \( \text{VO}_{2} \) in such a manner that it is biased against girls, or is there a true difference in \( \text{VO}_{2} \) that is gender specific?

Despite our incomplete understanding of \( \text{V}_{2\text{max}} \), it is still an important clinical tool. It may become more important when we have a clear understanding of how it should be measured. In the future, we might measure every individual’s \( \text{V}_{2\text{max}} \) and use that value to assess individual physical fitness throughout childhood. We might expect improvement of an individual’s \( \text{V}_{2\text{max}} \) with growth during development, much as we expect an increase in height or weight. We might use this change (or lack thereof) in \( \text{V}_{2\text{max}} \) to determine when to intervene and to evaluate the success of an intervention (timing of heart surgery, for example). Our understanding of all components of \( \text{V}_{2\text{max}} \) is still incomplete. Rowland and colleagues have added an additional piece to a complex physiologic parameter.

Reginald L. Washington, MD
Denver, CO

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Preventing Multidrug-Resistant Tuberculosis and Errors in Tuberculosis Treatment Around the Globe

During the years 1989 to 1992, when tuberculosis (TB) emerged once again as a major problem in the United States, outbreaks of multidrug-resistant