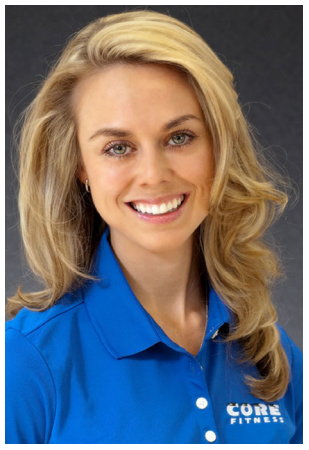

Breathing: What Is Its Role In Postural Control For Optimal Function?

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Whether you are training for a marathon, dancing, playing golf or tennis, training in the gym, partaking in a group fitness class, or picking up your child, proper posture and breathing are of the utmost importance. Movement dysfunction is evident when the mechanics of breathing and postural control are compromised.

Every muscle of the trunk has a simultaneous role in postural control and respiration. During functional movement, the cardiopulmonary system plays a significant role in the demand for postural stability.

The primary muscles that regulate intra-abdominal pressure include the diaphragm, intercostals, abdominals, and paraspinals. To effectively train the core, a co-contraction of these muscles, which produces force through the thoracolumbar fascia and creates intra-abdominal pressure, is necessary. This is what helps to support your spine, and, therefore, optimize postural control during functional movements. For example, the transversus abdominus (TVA), a deep core stabilizer, plays a critical role in synchronizing pressure changes with the diaphragm for optimal respiratory function during an inhale. But, it also provides stability during exhalation. Therefore, because breathing and postural control are inter-dependent, it is critical to address both for optimal function for daily living and performance.

Proper breathing comes from the deepest area of the lungs, but many of us have shallow, rapid breathing and use only the top third of our lungs. Correct breathing encourages effective oxygenation of the blood, allows muscles and organs to work efficiently, relaxes muscles, and releases tension enabling you to contract the inner unit of your core properly. This type of breathing is called diaphragmatic breathing and engages the diaphragm, the most efficient breathing muscle. It is a large, dome-shaped muscle at the base of the lungs. Your abdominal muscles help move the diaphragm and give you more power to empty your lungs.

Now, put one hand on your belly and one hand on your chest. Breathe deeply. Did the hand on your chest move first? If so, you would be considered a "chest breather." This indicates that you utilize your accessory muscles of respiration, and a possible breathing pattern disorder exists. Accessory muscles are typically recruited during a stress response, heavy exercise, or during an asthma attack. This can leave the diaphragm weakened and flattened, and for most people, upper chest breathing is inefficient and an ineffective way to function. Chest breathing is also associated with poor posture, tension headaches, and degenerative processes in the cervical spine. As an exercise to facilitate normal, healthy breathing, lie on your back, flatten your back, turn your palms flat on the ground, and keep them next to your body. Now, take three quick, short sniffs and one long sniff without exhaling. Practice this daily.

Posture, on the other hand, optimizes breathing and affects the circulation. Posture is the alignment and function of all the components of the kinetic chain at any given moment. Everyday posture is constantly changing to meet the demands placed upon the kinetic chain. Proper posture ensures that the muscles of the body are optimally aligned at the proper length-tension relationships necessary for efficient functioning. In other words, you are able to recruit the core muscles more efficiently to stabilize and protect your spine, thereby reducing your risk of injury by minimizing stress on joints and enhancing your performance in activities of daily living (ADLs), athletics, fitness training, and other functional activities. However, if you can't breathe properly, you are compromising both posture and function.

If one segment of the kinetic chain is out of alignment, it will create predictable patterns of dysfunction throughout the entire kinetic chain. Static posture can provide general structural information about muscles and joints, whereas dynamic postural observations can provide insight into the quality of functional movement patterns.

Perfect posture supports a "neutral spine." The natural curvatures of the spine include a cervical lordosis, thoracic kyphosis, and lumbar lordosis. Imagine a plumb line running through your body starting from your ears and moving down through your shoulders, torso, hips, knees, and ankles. Many of you sit all day. Are you the person who wakes up, sits to eat breakfast, drives to work, sits at a desk all morning, eats lunch at your desk, attends a meeting in the afternoon followed by finishing that additional work at your desk, drives home, eats dinner, and sits on the couch to watch TV? If this is you, you may have upper crossed syndrome, a predictable pattern of injury resulting from rounded, or protracted, shoulders, forward head, weak scapular stabilizers, and overactive shoulder and neck musculature. This flexed posture also contributes to decreased respiratory function.

In an attempt to pair breathing with a functional task, it is important to understand the following concept. Inhalation via diaphragm should coincide with neutral spine, increased intra-abdominal pressure, and postural control. Exhalation is often paired with flexion and gross postural stability. To help you understand this concept, think of the following examples. First, think about performing a squat. You inhale on the descent for two reasons. One: to create intra-abdominal pressure in an attempt to stabilize the spine, and two: to facilitate a neutral (or slightly extended) position in the spine. As your diaphragm contracts and lowers into the thoracic cavity, it pushes the organs down and out onto the abdominal wall. This, in turn, makes your stomach expand. However, your TVA is working eccentrically to compress the organs which create intra-abdominal pressure. Now let's look at another example, a shoulder raise. You can imagine this with dumbbells in hand or reaching up to grab something in a cabinet. Where would you inhale and exhale? Again, to facilitate neutral spine and create intra-abdominal pressure, you would inhale as you raise your arm(s) and exhale on the descent.

In summary, as you inhale, your umbilicus will move outward as your diaphragm works with the TVA to create intra-abdominal pressure and consequently postural stability. As you exhale, and your umbilicus moves inward, the additional stabilizing mechanism is activated, and the abdominals provide gross stability. Therefore, breathing properly improves the recruitment patterns of the core musculature for improved functional movement and postural mechanics. Additionally, it optimizes respiratory function, facilitates improved core stability and postural control, decreases the risk of shoulder/cervical injuries, and enhances overall performance. Is there a reason you wouldn't do this?

By training functional movement patterns, a chain of exercises that are linked together in a continuous flow, the body becomes more efficient as the focus shifts from the sequence to breathing, balance, and posture as the body moves from one position to the next. Start breathing and start living.

About CORE Fitness

Arianne Missimer is a Registered Dietitian, a Certified Strength and Conditioning Specialist, and has her Doctorate of Physical Therapy from Neumann University. She is also the owner of CORE Fitness, specializing in one-on-one personal training for performance enhancement and injury prevention. This training method utilizes functional movement patterns for a complete fitness program, addressing movement efficiency, balance, flexibility, strength, coordination, speed, power and endurance. Arianne trains a diverse group of clientele, including recreational and competitive athletes at all levels, to improve their game through proper core conditioning and functional training. With Arianne's eleven years of experience in the field, she is committed to restoring optimal health and fitness to people of all ages, with acute and chronic conditions, functional limitations and disabilities.

Testimonial

"I first heard about CORE Fitness from my dance instructor, Brian Wells, who encouraged students that were interested in improving their dance frame and overall health to obtain personal training at CORE Fitness. Although I exercised frequently prior to personal training, I was not seeing sufficient results in weight reduction, stamina, and strength. One key goal was to get into top shape for a cruise vacation that I have planned in October 2010. What makes the CORE Fitness experience unique is the relationship between my personal trainer, Ashley Paoli, and me. This is more about working towards individualized goals and less about just completing a set of machines or weights. I feel confident that my personal trainer has my best interests in mind and the focused attention on the form of each exercise rather than just repetitions ensures that I know how to practice the routines even when I do them at home. The atmosphere at CORE Fitness is one of camaraderie, a "we-are-all-in-this-together" attitude that helps keep up my motivation and the trainers walk the talk of health and fitness, offering advice they use themselves regarding exercise and nutrition tips. In less than one year, I have lost 30 pounds and one full dress size, improved my posture and balance, as well as improved my dance frame. I have increased my walking and running pace by minutes per mile and overall stamina that a three-hour dance session is invigorating rather than exhausting. I absolutely would recommend CORE Fitness Studio to others. When asked about my slimming and more muscular appearance, I mention CORE Fitness and dancing as a deadly combination against fat and feeble excuses for not attaining your optimal shape."

~ Renata Maslowski, CORE Fitness client