

The Importance of Core Stability

The growing awareness and importance of core stability is a result of worldwide research analyzing specific muscles and their functions. Why is this so important? Low-back pain is debilitating. Anyone who has experienced it can tell you his or her personal struggle. In America, 85 percent of all people below the age of 50 will experience some type of back pain. The economic and social implications of such a high percentage of back pain can be staggering. How can we combat this? Core stability.

What is the core? For simplicity, imagine the core as the spine, ribs, pelvis and the related muscles that attach to those structures. The head, arms and legs are all attached to the core by means of ligaments, tendons, muscles and joints, but are not considered part of the core. However, any movement from the arms or legs requires stabilization from the core. If the core lacks strength, yet the arms and legs are strong, the core can be damaged if the arms and/or legs are used at full capacity.

For example, when lifting a box one always adheres to the advice of using the legs to lift, not the back. As the arms grasp the box, the legs lift the body weight and the weight of the box. However, this activity requires core strength. If the core strength is lacking, the forces generated by the legs and arms to lift the box and body can extend the joints and muscles of the core stabilizing structures. This can lead to possible strain of a muscle and sprain or a joint. The resulting damage to muscle tendons and joint ligaments can promote chemical reactions causing pain and muscle spasms.

Most people think of the low back when talking about core strength, but here is another example. Take the case of hitting a ball with a racquet; the muscles generate movement of the arm through muscle contraction to accelerate the racket. Muscle contraction is needed to stabilize the shoulder girdle on the torso when the ball contacts the racquet. Muscle contraction is needed to decelerate the

arm as the racquet continues through its trajectory. This appropriate muscle activity creates stabilization without joint damage. This is another example of the body's reaction to dynamic forces to create stability and prevent injury.

When a person moves, it is a conscious effort created by nerve impulses generating muscle contraction to move a bone in a certain direction or stabilize a bone. This movement, whether it is the arm throwing a ball or the arms lifting a box, needs to be stabilized by the core. Certain muscles are voluntarily contracted to create movement. However, there are numerous muscle contractions that are non-voluntary, but reflexogenic (we do not have conscious control of these). For example, when doing a sit-up, the rectus abdominus, internal and external oblique, transverse abdominus and the iliopsoas are all activated. To create stability of the core, the paraspinal muscles—the multi-fidi, rotators and transversii—are all activated to prevent injury to the spine as forces from the muscles performing the sit-up are acted upon the spine. This activity of the paraspinal muscles is innate, one that we cannot consciously control. The nerves from muscles and joints send information into the nervous system reflexogenically activating the core muscles to stabilize the surrounding joints. These muscles support the spine and communicate with the spinal cord and brain. The recruitment of these muscles is key, but the way they recruit is as important. The timing of coordination of muscles is paramount. Strong core muscles lead to improved lumbar spine support and function and better nervous system control. They “brace” your spine. They support it and fight against the forces applied on the lumbar spine. These muscles also play an active role in pelvic floor support, improve bladder control and can reduce incontinence and increase sexual function.

Having identified the key muscles and how they act, the next step is to establish how best to train these

muscles. Foam rollers, exercise balls, balance trainers and another balance aids can be used to enhance core stability training. A good tip to remember when working on core stability is that it is not about speed, but rather small, controlled, conscious movements. Core training is best done when the body is placed in an unstable environment, on a dynamic surface in order to recruit a proprioceptive, kinesthetic and balance system. The goal is to teach your body to make correct use of all the layers of muscles, voluntary and involuntary, in different postural positions. The ultimate aim of core stability training is to ensure that the deep trunk muscles are working correctly to control the lumbar spine during dynamic movements. Therefore, it is important that once you have achieved proficiency of the simple core exercises, you must progress to achieving stability during more functional movements involved in everyday activities.

A training regimen designed to target those muscles can significantly reduce present and future low-back pain, neck and posture problems, and also improve athletic performance by moving more efficiently and effectively and increasing the transfer of energy from core to limb. A personal trainer, Pilates instructor, yoga instructor or appropriate health-care provider can help you tailor a program to your specific needs, limitations, or a sport specialty and help you progress and reach your maximum potential. Creating core stability takes time and concentrated effort through specific movements, yet the payoff is immense and long-lasting.



Thomas Gentry McGrath, D.C., D.A.C.N.B. is a chiropractor specializing in neurology & sports. He takes a natural approach to correcting problems through treatment & muscular rehabilitation. His client base includes golfers; tennis players, swimmers, runners, cyclists & triathletes.