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# Importance of CORE STABILITY

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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 these 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 exceed the strength of the joints and muscles of the core stabilizing structures. This can lead to possible strain of a muscle and sprain of 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 racket. Muscle contraction is needed to decelerate the arm as the racket continues through its trajectory. This appropriate muscle activity creates stabilization without joint damage.

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 multifidi, 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 the 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 other 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. 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 activity.

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.

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