

# Core/Trunk Stability

## What Is Core Stability?

Core stability is about isolating and engaging the deep stabilizing muscles of the pelvis and spine and about stabilizing the trunk while we move.

The aim of core stability training is to learn how to effectively recruit the trunk musculature and then learn to control the position of the lumbar spine during any type of dynamic movements.

## Core Stability Muscles

The deep trunk muscles, Transversus Abdominis, Multifidus, Internal Oblique, paraspinal and the pelvic floor, are key to the active support of the lumbar spine. The co-contraction of these muscles produce forces via the "thoracolumbar fascia" and the "intra-abdominal pressure" mechanism which stabilise the lumbar spine, while the paraspinal and the multifidus muscles act directly to resist the forces acting on the lumbar spine.

## Core Stability Training

Having identified the key muscles and how they act, the next step is to establish how best to train these muscles. By definition, the deep-trunk muscles act as "stabilisers" and are not involved in producing movements, but instead involve static, or isometric, contractions. Furthermore, they must act as stabilisers continuously throughout everyday activities as well as fitness and sport activities, and so require very good endurance of low-level forces. These muscles do not need to be very strong, but they must be correctly co-ordinated and capable of working continuously. In addition, these stabiliser muscles need to be able to hold the lumbar spine in the neutral position, which is the correct alignment of the pelvis that allows for the natural 'S' curve of the spine.

## The Basics

In order to achieve the best possible stability, you need to be able to contract the pelvic floor at the same time as hollowing the lower abdominals to engage transversus abdominis. As this has been identified as key to the lumbar-support mechanism, core-stability training begins with learning to co-contrast the transversus abdominis and multifidus muscles effectively.

To perform the co-contraction of these muscles, you must perform the "abdominal hollowing" technique with the spine in the neutral position. To do this use the following guidelines:

- Start by lying on your back with knees bent
- Your lumbar spine should be neither arched up nor flattened against the floor, but aligned normally with a small gap between the floor and your back. This is the "neutral" lumbar position you should learn to achieve
- Breathe in deeply and relax all your stomach muscles, now breathe out and, as you do so, draw your lower abdomen inwards as if your belly button is going back towards the floor. In Pilates this is describes as "zipping up", as if you are fastening up a tight pair of jeans
- Hold the contraction for 10 seconds and stay relaxed, allowing yourself to breathe in and out as you hold the tension in your lower stomach area
- Repeat 5-10 times

It is vital that you perform this abdominal hollowing exercise correctly otherwise you will not recruit the transversus abdominis and multifidus effectively. Bear in mind the following points:

- Do not let the whole stomach tense up, or your upper abdominals will bulge outwards, which means you have cheated by using the large rectus abdominis muscle (the six-pack) instead of transversus abdominis
- Do not brace your transversus abdominis muscle too hard; just a gentle contraction is enough. Remember it's endurance not maximum strength you are trying to improve
- Do not tilt your pelvis nor flatten your back, as this means you have lost the neutral position you are trying to learn to stabilise

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- Do not hold your breath, as this means you are not relaxed. You must learn to breathe normally and maintain the co-contraction of transversus abdominis and multifidus.
- Use your fingers for biofeedback on either side of your lower abdomen to feel the tension in the TA muscle.
- Once you have mastered the abdominal hollowing lying on your back, practice it lying on your front, four-point kneeling, sitting and standing. In each position, get your lumbar spine into neutral before you perform the hollowing movement.

Having learned to recruit the transversus abdominis and multifidus muscles correctly in various positions, which can take anything from one session to one month or more, it is time to move onto simple core stability exercises. These exercises may also involve the oblique muscles, other lumbar muscles and gluteals to assist the transversus abdominis and multifidus in maintaining the lumbar spine in a stable neutral position.