

CORE STABILITY



Core stability is fast becoming a buzz-word in rehabilitation and fitness training. It is hard to avoid hearing about core strength training, stability training or core training in the gym and fitness centres these days. Unfortunately, despite their similarities and inter-changeable use, they mean quite different things.

THE CORE

The term “core” according to the dictionary means “the central part, of different character from the surroundings”. When applied to the human body, it refers to the torso, the body from the neck down to the hips not including the arms and the legs.

To understand the difference between the various core stability terms, let us begin with the muscles. There are two muscle groups - stabilisers and mobilisers. Stabiliser muscles are weaker compared to mobilisers but have greater endurance. Imagine the stabiliser muscles as a marathon runner and the mobiliser as the 100m-sprinter. One trains for endurance over long distances while the other trains for explosive power over short distances.

What do stabiliser muscles do? They help stabilise

the various joints and body parts during movement created by the mobiliser muscles.

Stabiliser muscles

may be further classified into primary and secondary stabilisers. Primary stabilisers do not create significant joint movements while secondary stabilisers provide excellent stabilising effects as well as causing some joint movements.

CORE STABILITY TRAINING AND CORE STRENGTHENING

The main difference between core strengthening programmes and core stability training programmes are the muscles trained.

Core strengthening programmes aim to strengthen the muscles of the core, for example to improve upper body strength working on the pectoral muscles and upper back muscles. As you might guess, they primarily target at the big mobiliser muscles.

Core stability programmes on the other hand target at the primary and secondary stabiliser muscles. The big and more

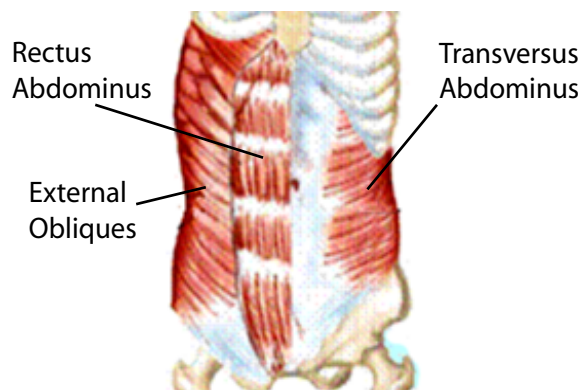
KEY DIFFERENCES BETWEEN STABILISORS VS MOBILISORS MUSCLES	
<p><u>Stabilisor</u></p> <ul style="list-style-type: none"> • Deeply placed • Aponeurotic • Slow twitch • Active in endurance activities • Selectively weaken • Poor recruitment, may be inhibited • Activated at low resistance levels (30-40% Maximal Variable Contraction (MVC)) • Lengthen 	<p><u>Mobilisor</u></p> <ul style="list-style-type: none"> • Superficial • Fusiform • Fast twitch nature • Active in power activities • Preferential recruitment • Shorten and tighten • Activated at higher resistance levels (above 40% MVC)

Source: Functional Load Abdominal Training Part 1, C.M. Norris, Physical Therapy in Sports, (2001) 2, 29-39

TRUNK MUSCLE CATEGORISATION		
Stabilisors		Mobilisors
Primary	Secondary	Rectus abdominis
Transversus abdominis	Internal-oblique	Lateral fibres of external obliques
Multi-fidus	Medial fibres of external oblique	Erector spinae
	Quadratus lumborum	

powerful mobilisor muscles do not come into play.

However, do not mistake core stability



training to mean light weights and easy exercises. While activation for mobilisor muscles is at about 30-40% of maximal variable contraction (MVC), it can signify quite different levels of effort and strength for people. A competing athlete's 100% MVC is many times higher than weekend-warrior. So the 30-40% MVC is naturally also many times higher.

Core stability training can be separated into three different levels - rehabilitative, regular, and sports performance.

REHABILITATIVE CORE STABILITY TRAINING

Mainly for people with back or neck problems who are focused on rehabilitating their primary stabilisor muscles which are likely to be very weak or possibly turned-off (pain inhibits the activation of the stabilisor muscles).

At this stage, they require close supervision

by qualified physiotherapists to ensure 1) that they do not injure themselves further and 2) that they correctly activate the right muscles. If not done correctly, it is easy to recruit the mobilisor muscles by mistake, missing the purpose of the training.

There are four key components in rehabilitative core stability training

1. Muscle Flexibility – poor flexibility pulls the spine away from the neutral position.
2. Mobility – the smoothness of the movement.
3. Strength – the strength and activation of the core muscles
4. Stamina – the endurance of the muscles to support the joint over time.

REGULAR CORE STABILITY TRAINING

This targets both the primary and secondary stabilisors as well as some mobilisors. At this stage, there is no more pain or infrequently recurring pain. Strength and stamina is emphasised. Regular practice ensures the automatic or better activation of the stabilisor muscles during day-to-day activities.

SPORTS PERFORMANCE CORE STABILITY TRAINING

For sports performance purposes, the stabilisor muscles are placed under great strain to hold joints in the optimal position throughout very vigorous movements. Mobilisor muscles are also trained to help stabilise and work together in tandem, correcting imbalances through the range of a complex movement such as a tennis serve or golf swing.