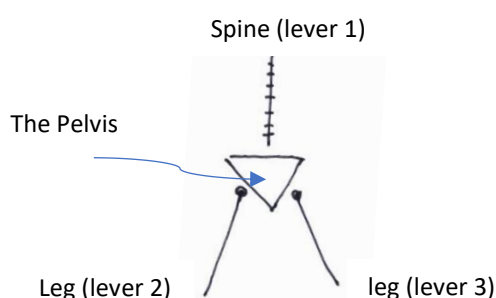


THE CORE – SIMPLIFIED!

Dysfunction at the core can be a factor contributing to many injuries. This section outlines its role in stability at the spine and how it also contributes to other functions in the body.

It is helpful to view your spine as one of three levers that converge at the pelvis (often referred to as the core). The other two levers being your legs! (see picture 1). Dysfunction at one of these levers (i.e. pain stiffness or poor movements) will have an effect upon the other levers and result in reduced loading, protective movements or compensatory movements at any one of these levers. Therefore, it is very important to consider the spine as part of the pelvis and lower limb complex when treating lower back pain. This analogy also helps us to understand how poor pelvic and spinal functioning can cause knee pain, hamstring strains and other lower limb injuries. The pelvis is also home for our reproductive and excretory organs and therefore dysfunction at the core can also manifest as non-musculoskeletal conditions (i.e. bladder and bowel dysfunction).

Fig 13: the interaction between the three levers at the pelvis



Stability at the core is also influenced by structures further up the kinetic chain where the spine articulates with the ribs to form the thoracic cage (see fig 11). The thoracic cage not only protects our vital organs (heart and lungs) but also expands and relaxes to assist the diaphragm in drawing air into our lungs during respiration. Poor core functioning can increase demands upon the thoracic cage and diaphragm altering our breathing patterns at rest and during exercise as well as become a source of pain. The scapular (shoulder blades) rest and articulate upon the thoracic cage and may also become affected by poor thoracic functioning causing upper limb pain (fig 12).

Fig 14

The relationship between the pelvis and thoracic

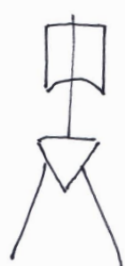


Fig 15

The position of the scapular and attachment of the upper

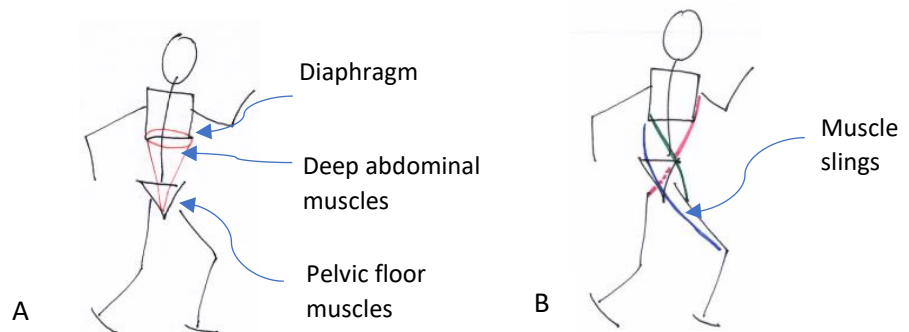


Interaction of the three levers and between the pelvis and thoracic cage is dependent upon muscular contractions and passive stabilizing structures (ligaments) and this is co-ordinated by the nervous system to provide optimal stability for a specific task. During high level activities such as heavy lifting, greater muscular contractions to increase bracing at the spine is required. However, we also need to be mobile at the spine in order to perform more dynamic tasks. Therefore, muscular contractions need to brace or stabilize the spine as well as mobilize the spine during dynamic activities. To that end we can identify two types of muscles that contribute to stability at the spine; these are the inner (or stabilizing muscles) consisting of the diaphragm, deep abdominal and trunk muscles and pelvic

floor muscles and outer or mobilizing units that form slings of muscles acting over the trunk and limbs.

Fig 16

A: the inner muscle unit
and B: the outer units:



Core stability therefore not only refers to strength at the abdominal region as commonly accepted, but the interaction between the three levers to allow optimal lower limb movements, the relationship between the pelvis and the thoracic cage, bladder and bowel functioning, sexual functioning, breathing and upper body movements. The relationship between the pelvis and the thoracic cage is a huge consideration when assessing your core function (including posture, muscle imbalance and movement patterns) and forms the initial assessment of your core stability before progressing to strength training.

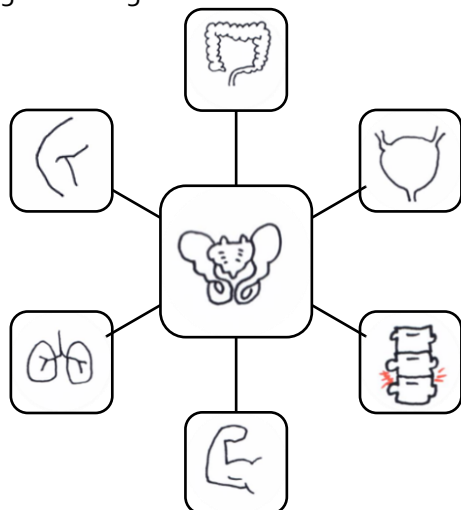


Fig 17

Poor core stability can affect the digestive system, bladder functioning, cause lower back pain, affect upper limb, breathing patterns and lower limb injuries.

A final point to consider is the effect upon our central nervous system (CNS). Altered movement patterns because of poor core stability, pain and altered breathing patterns can send altered signals to our brain. These signals are then wrongly processed within our CNS resulting in fear of movement, avoidance patterns and suboptimal movements that may persist our pain.

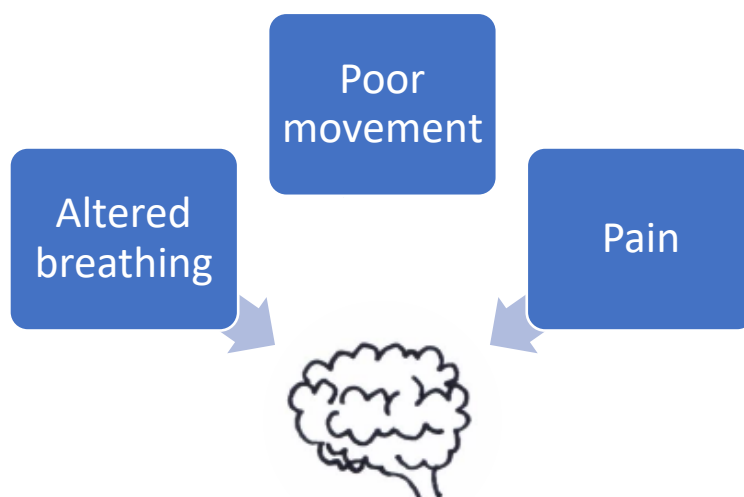


Fig 18

Factors contributing to motor control

