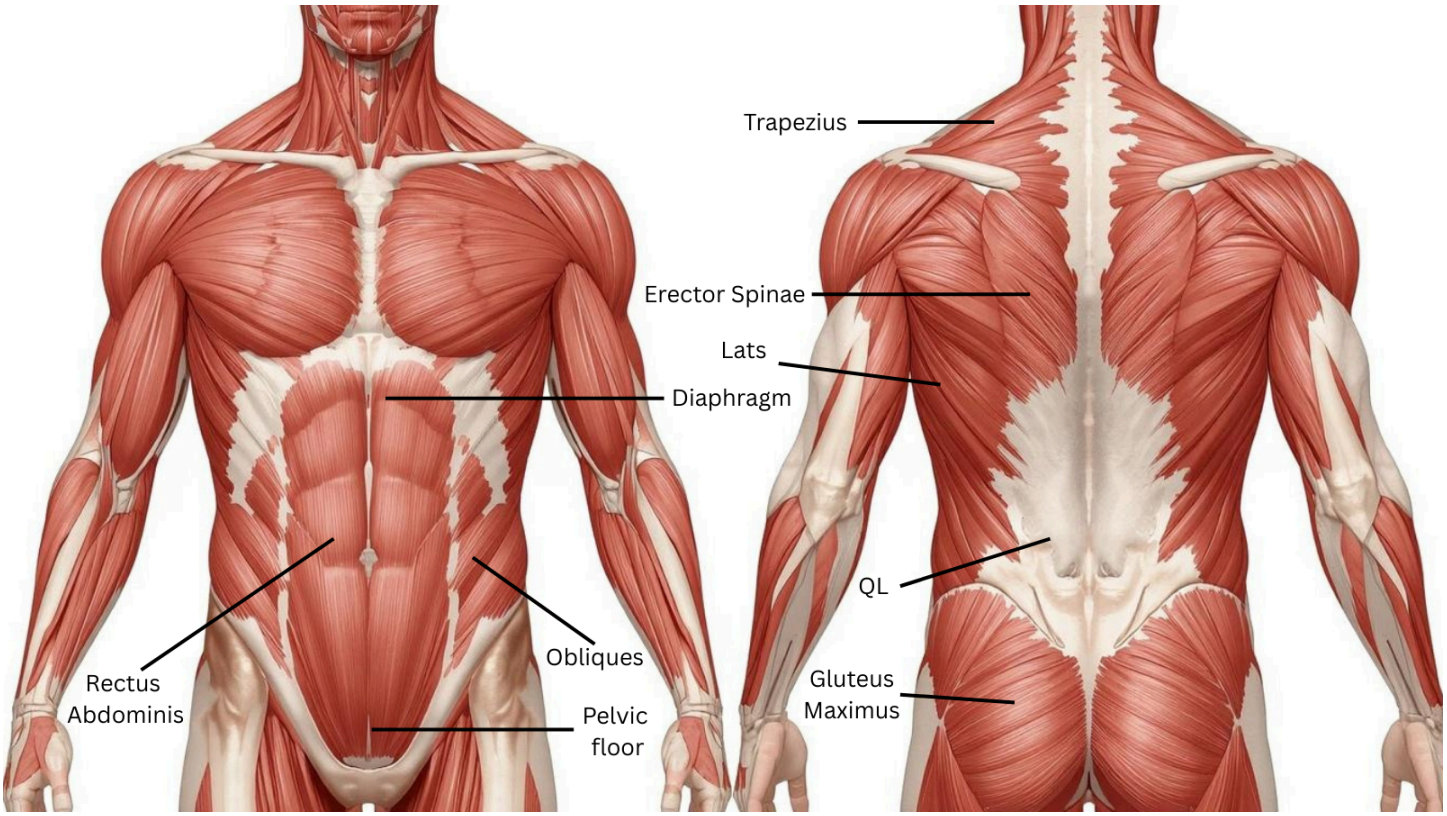
Core Muscles and Their Nerve Innervations

The core includes both major and minor muscles which stabilise and support the spine, pelvis, and trunk during movement. Muscles do not move without nerve impulses - adjustments restore nerve communication by improving proprioception to the brain (real-time, subconscious information relating to posture, body position, and movement, primarily using mechanoreceptors (movement receptors) in muscles and joints.

"Spinal stability and diaphragm function and deeply linked" - *Kolar et al., (2010)*

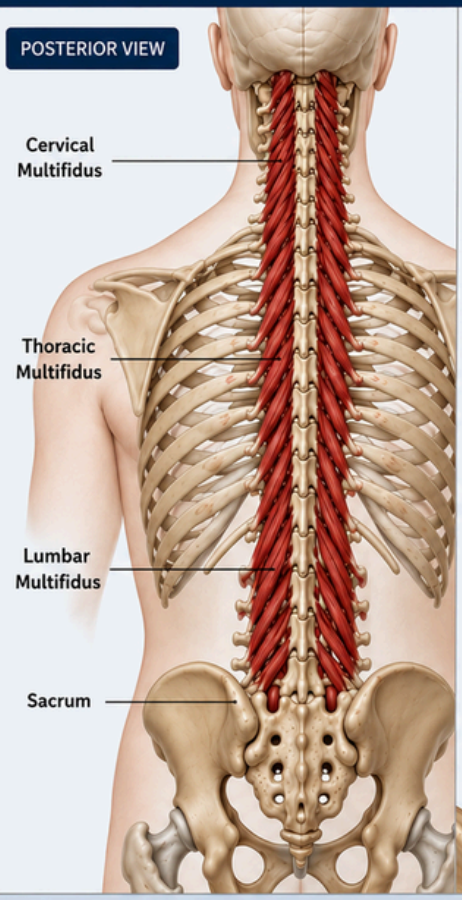
Muscle	Nerve Innervation
Rectus Abdominis	Thoracoabdominal nerves (T6-T12)
External Oblique	Thoracoabdominal nerves (T5-T12), iliohypogastric nerve, ilioinguinal nerve
Internal Oblique	Thoracoabdominal nerves (T6-T12), iliohypogastric nerve, ilioinguinal nerve
Transversus Abdominis	Thoracoabdominal nerves (T6-T12), iliohypogastric nerve, ilioinguinal nerve
Quadratus Lumborum (QL)	T12 and L1-L4 nerve roots
Erector Spinae (Iliocostalis, Longissimus, Spinalis)	L1 - L5 (Dorsal rami of spinal nerves)
Multifidus	L1 - L5 (Dorsal rami of spinal nerves)
Diaphragm	C3 - C5
Pelvic floor	S2 - S4
MINOR CORE MUSCLES:	
Gluteus Maximus	L5 - S1
Trapezius	Accessory nerve (Cranial nerve 11), C3-C4
Lats	C6 - C8



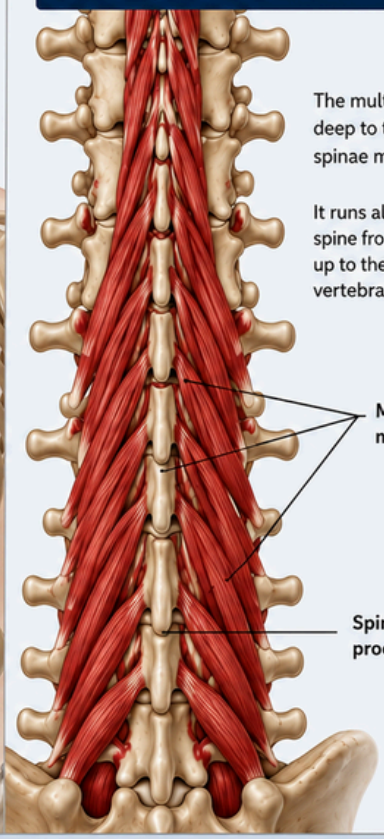
THE MULTIFIDUS MUSCLES

Deep stabilisers of the spine

POSTERIOR VIEW



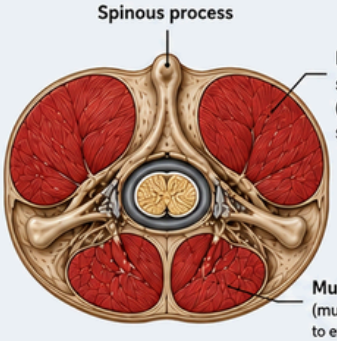
DEEP VIEW (REMOVING SUPERFICIAL MUSCLES)



The multifidus lies deep to the erector spinae muscles.

It runs alongside the spine from the sacrum up to the cervical vertebrae.

CROSS SECTION (LUMBAR LEVEL)



FUNCTIONS

- Stabilises the spine at each segment (vertebra by vertebra)
- Helps maintain posture and spinal alignment
- Provides proprioceptive input to the brain (awareness of spinal position and movement)
- Helps protect spinal joints and discs by controlling excessive movement

KEY POINT

The multifidus is a deep, segmental stabiliser of the spine. When it becomes weak or inhibited, spinal stability, posture and movement control can be affected – often contributing to low back pain. **The multifidus acts like the spine's internal stabilising system. It doesn't generate large movements; instead, it constantly monitors and controls the position of the spinal joints. Rehabilitation exercises help retrain this system so the brain can better control posture, balance and movement.**