

# Journal of Personal Training™

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# Balanced Trunk Training

## Hitting All Movement Planes

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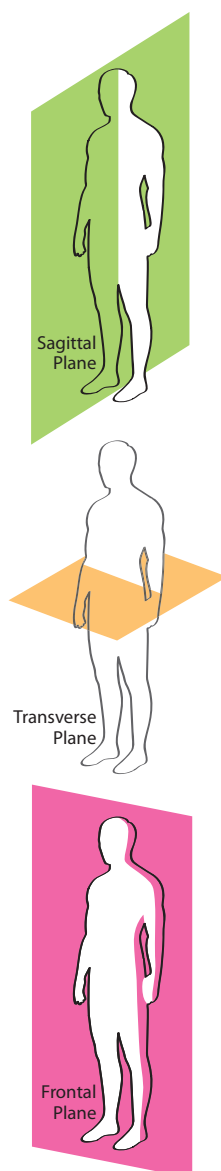
Just like any other body segment, the trunk should be challenged using various functional movement planes and patterns for balanced muscular development. Conventional abdominal training often includes excessive trunk flexion for development of the rectus abdominis, such as crunches, sit-ups and leg lifts, with a focus on sagittal-plane loading. However, the core musculature functions to perform various other complementary movements, and is utilized to maintain proper bodily alignment for protection of the spine. Therefore, trunk training should unite the stress that supports a healthy spine.

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Fundamental movement patterns for trunk training include flexion, extension, rotation, lateral flexion and transverse flexion (as well as combined efforts as applicable). Flexion and extension occur in the sagittal plane, rotation occurs in the transverse plane, lateral flexion occurs in the frontal plane and transverse flexion occurs in both the sagittal and transverse planes (from a simplified, practical perspective). Of course, many functional trunk exercises combine multiple movement planes in a single action at the muscular level. Other applicable activities (which are not always a staple of client programs unless clear activation problems present) can include bridges, planks and other isometric holds for developing stabilization-related endurance. During many of these actions no joint movement occurs so no movement plane is theoretically applied.

The primary superficial muscles (movers) of the trunk include the rectus abdominis, erector spinae group, internal and external obliques, and quadratus lumborum (QL). The primary deeper stabilizers include the transverse abdominis, pelvic floor, multifidus and diaphragm (known collectively as the inner unit). The deep stabilizers must activate before superficial movers to brace the spine for loading; if incorrect activation patterns are present a primary initial goal should be to improve stabilizer-mover coordination. This can include teaching bracing techniques and the use of applicable bridges to promote coordinated efforts from the trunk and hip musculature of the lumbo-pelvic region (e.g., single-leg bridges with hip thrust, alternating bridge reaches). This will support heavier loading in the future with a lower risk for lower back strain and compensatory movement patterns. Other muscles of the hip (e.g., gluteals, hip flexors) and connected structures assist the trunk during movements, remember everything in the body is connected in some way, and deformation of these connections mean issues in one region of the body can impact others. To keep the discussion simplified and focused on practical applications we will focus on the trunk/abdominal musculature only.

As mentioned, when given free choice many people



end up focusing on sagittal-plane flexion exercises during abdominal training in a futile attempt to improve the aesthetic properties of their rectus abdominis. Excessive performance of work in any movement plane at a given body segment can lead to postural distortion and strength imbalances over time. Note that trunk flexion:extension strength ratio is optimally 1:1 in the sagittal plane.

Trunk flexion (sagittal plane) work can include variations of crunches and reverse crunches but should be progressed to hanging positions and balance work. These can be applied using progressions from the floor, on a stability ball to hanging from a pull-up bar. Functional, free movement activities should be preferred over selectorized machines with unnatural or excessively-guided ranges of motion.

Trunk extension (sagittal plane) work primarily challenges the erector spine with collaborative support from the gluteals and lats depending on activation patterns and use of the posterior oblique sling system. Selectorized back extensions are not functional or exceptionally useful for most clients. Fitness professionals will make better use of activities such as good morning with reaches, quadruped – kneeling plank reaches and bench bridges to help improve coordination between the hips and lower back.

Trunk rotation (transverse plane) work challenges the obliques to a greater extent with collaborative effort from the rectus abdominis and lateral flexors. Various-angle rotations or chops can be performed using cables, medicine balls [MB] (for mobility), and stability balls. Again, performing functional, closed-chain rotations are preferred over machine work which often allows the exerciser to contribute to the movement with their hips.

Trunk lateral flexion (frontal plane) work also challenges the external/internal obliques as well as the QL. Overhead MB leans and split stance cross reaches can be ideal to incorporate coordinated activation of this under-utilized musculature. Frontal plane loading of the trunk is often just as under-represented in programs as frontal plane loading of the hips.

*The following sample exercises are categorized by movement plane and can be useful in client programs based on competency and goals:*

# Sagittal Plane

## Trunk Exercises

MB slams  
(*flexion*)



Opposite Raise  
on stability ball  
(*extension*)



# Transverse Plane

## Trunk Exercises



Band golf swings  
(rotation)



Stability ball skiers  
(rotation)

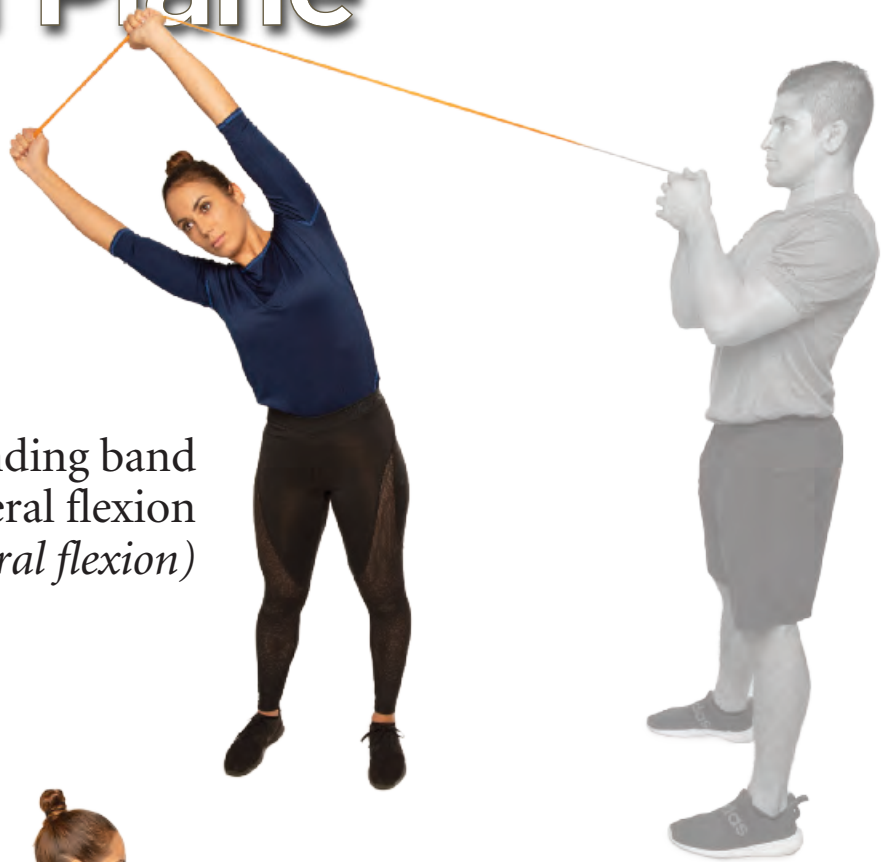




# Frontal Plane

## Trunk Exercises

Standing band  
lateral flexion  
(*lateral flexion*)



DB lunge  
with lean  
(*lateral flexion*)

Balanced Trunk Training – Hitting All Movement Planes

The CEU Quiz is now available online at:

<http://www.ncsf.org/continued/onlineceu.aspx>

