



The Exercise Technique Column provides detailed explanations of proper exercise technique to optimize performance and safety.

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# The Long-Lever Posterior-Tilt Plank

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## ABSTRACT

THE LONG-LEVER POSTERIOR-TILT PLANK IS AN ADVANCED VERSION OF THE TRADITIONAL PRONE PLANK DESIGNED TO IMPOSE A GREATER STIMULUS ON THE CORE MUSCULATURE AND THUS PROVIDE BETTER UTILITY FOR THOSE WHO ARE WELL TRAINED.

The traditional prone plank (TPP) is a popular fitness exercise used extensively in both physical conditioning (2) and rehabilitative (1) settings. Although the TPP has proven to be an effective movement for a variety of fitness goals and abilities, it may not effectively challenge the neuromuscular system in more experienced exercisers (8,10). The long-lever posterior-tilt plank (LLPTP) is an advanced version of the TPP designed to impose a greater stimulus on the core musculature. The LLPTP modifies the TPP in 2 primary ways: first, the elbows are positioned closer together and further toward the head compared to the TPP. Second, the gluteal muscles are isometrically activated to elicit a posterior pelvic tilt, whereas the pelvis is maintained in neutral position in the TPP. In combination,

these modifications significantly increase the difficulty of the move and thus can help to elicit a greater adaptive response in those that are well trained.

## MUSCLES USED

Studies show that performance of the TPP involves most of the major muscles of the core, including the internal oblique, rectus abdominis, external oblique, erector spinae, latissimus dorsi, multifidus, gluteus maximus, and gluteus medius, (5–7). Although no study to date has directly investigated muscle activation in the LLPTP, it stands to reason that muscle involvement would be comparable given the fundamental similarities between variations. Based on applied biomechanical principles and implied inference of experimental research, it seems reasonable to speculate that recruitment of the core musculature would be enhanced in the LLPTP compared with the TPP. The longer lever length and narrower base of support associated with the LLPTP makes the exercise less stable as decreased stability has been shown to significantly increase core muscle activity during performance of various core exercises, including the prone plank (4,5). Furthermore, holding an isometric posterior

pelvic tilt has been shown to generate greater muscle activation in the lower rectus abdominis, upper rectus abdominis, external oblique, erector spinae, and multifidus musculature in both healthy subjects (11) and those with low back pain (3). Similarly, performing dynamic exercise (hip extension and double straight leg lifts) in posterior pelvic tilt increases core activation in various core muscles when compared with performing these movements in anterior pelvic tilt or neutral pelvic positions (9,12). Taken as a whole, the evidence strongly indicates that the LLPTP promotes a heightened challenge to the core musculature compared with the TPP.

## EXERCISE TECHNIQUE

To perform the LLPTP, the individual begins by lying facedown on the floor, with the feet together, and the spine and pelvis neutrally aligned. The hands should be balled into fists and kept in neutral position (i.e., thumbs up and little fingers on the floor). The elbows are spaced approximately 6 inches apart at nose level. To increase the level of difficulty, the elbows can be moved even more superiorly, which further augments lever length. The



Figure. Long-lever posterior-tilt plank.

individual lifts the body up on the forearms and toes so that the elbows are kept at an approximate 100-degree angle, and the torso and lower extremities form a straight line with the lumbar spine in neutral position. The gluteals are then contracted as strongly as possible while the individual attempts to draw the pubic bone toward the belly button and the tailbone toward the feet (see Figure). This position should be held while the individual continues to attempt to maximally contract the glutes. Any movements that deviate from the technique described would be considered compensatory and should be avoided. For example, a common error is allowing the hips to drop or sag when in fact the body should remain rigid throughout performance. Coaches should pay particular attention to the level of glute contraction and cue for increased glute activation if they visually notice a decline in gluteal firmness or posterior pelvic tilt. An exercise mat can be used to alleviate any discomfort on the

distal upper extremity joints and musculature.

The duration and number of sets should be based on fitness level and training goals, and more basic plank variations should be mastered before attempting the LLPTP. A basic routine would be to perform 2–3 sets of 10- to 30-second isoholds. As the individual becomes more skilled in exercise performance, longer durations, and/or additional sets can be implemented to further challenge the core musculature.

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