

Introduction to Biomechanics

The major takeaway from specificity to adaptation is there always be a change to an alteration. For example, throwing a rock into a static pond filled with cyanobacteria and witnessing the ripple effect. Once the initial stimulus is removed, the water returns (not exactly) to a similar state. The same concept can be applied to an injured knee and wearing a knee brace; to accommodate the 'change' the body will adapt and increase the output from the hip.

Like all things under the sun, biomechanics is not Michael Jackson. Walking is a multi-planar movement, involving the sagittal, frontal and transverse plane. Okay, easy? Throw multiple levers (1, 2, 3), axis (longitudinal, mediolateral, anteroposterior), joints (uni, bi, multi), agonists, antagonists, synergists, velocity, speed, and all things physics into the mix, walking is a complex movement with 7 distinctive phases (similar to death). During transitional phases, what was once the agonist might become the antagonist or vice versa. For example, during the flat foot phase the gluteus maximus and rectus femoris eccentrically contract to flex the hip and knee. In the mid-strike phase, the body begins to concentrically contract the biceps femoris and vastus medialis to accelerate the extension of the hip and knee. Including a knee brace or generating movement during an injury slightly alters the biomechanics of a simple task, like walking, to specifically adapt to the 'change'.