

WHAT IS BIOMECHANICS AND HOW DOES IT RELATE TO ME?

The human skeleton is, quite literally, a system of components and levers. These levers can produce four types of movement, said another way, there are four pathways through which these levers can produce movement of an object.

Rotatory motion is movement of an object or segment around a fixed axis in a curved path. Rotatory motion is the primary action of nearly every joint in the human skeleton.

Translatory motion is the movement of an object or segment in a straight line. While this is only minutely found in the human skeleton, multiple joints acting together can result in gross translator motion.

Curvilinear motion is created when rotary and translator motion is combined. Though subtle, this is the most common form of joint motion. All human joint axes shift slightly during movement combining rotatory and translator motion.

The fourth path of motion that can be taken by an object has been described as **general plane motion**. Similar to curvilinear motion, general plane motion is a combined result of rotatory and translator motion. The difference being curvilinear motion acts around a restrained axis and general plane motion can be a combination of restrained and free axes.

We spend a lifetime practicing and perfecting these movements with varied speeds and forces. For an example, as an infant we practice making a fist then opening our fingers big! It's tough at first – creating response on demand – but eventually we get it; A few months of practice transfers to us wrapping our fist around a bottle then releasing it when we're done. This transfers to grasping bicycle handle bars, a baseball, a pen... each requiring varied strengths, precision and speed. As we grow, these challenges become more complicated and more integrated. We refine our skills so that we move efficiently; often unaware of the integral and complex movements our neuromuscular system is controlling to create gross, powerful results.

Biomechanics is the study of these components and levers and forces' effects within this system.

Have you ever wondered how the transfer from bottle to bike works? Or how some can efficiently throw a baseball 91 mph, for a three hour game, with no injuries and others cannot? What causes carpal tunnel syndrome and why can you work behind a desk your whole life without pain – but then suddenly it starts and doesn't go away?

Biomechanics explains this. Muscles create internal forces that act upon the skeletal lever system. Gravity, inertia, the mass of our limbs and whatever objects we may be manipulating (or that may be manipulating us) create external forces. It is our ability in developing skilled biomechanical relationships between internal and external forces with our

skeletal lever system that is the greatest determining factor in our structural balance, athletic ability and injury prevention/rehab.

Just like any relationship, biomechanics can be manipulated, nurtured and refined. This exercise is designed to be a starting point to do just that.



FOREARM PRONATION/SUPINATION

Strengthens the hand, wrist and elbow while challenging the shoulders and spine to stabilize.

1. Seated on ball, attach tubing to your left. Hold tubing with your right palm down and left palm up. Rotate your hands away from the tubing - the tubing will twist around your hands.
2. Maintain the rotation in your forearms, slowly rotate your torso away from the tubing to achieve the finished position, as seen here.
3. Hold the finished position for six to ten seconds, repeat 10-15 times. Switch sides.

*Yours in Health,
Pamela Minix*