

Multiplanar Training: “The Forgotten Plane”

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Frontal plane movement or lateral movement is the "forgotten plane of training" in the exercise and conditioning world. It can be described as the imaginary bisector that divides the body into equal front and back halves. The motions primarily involve abduction and adduction (side-to-side motions). Abduction takes a limb away from the midline of the body and adduction takes the limb closer to the midline of the body. The training world is filled with open chain exercise machines that stress unidirectional movement in this plane. Machine based or open chain frontal plane movements would include exercises performed on a hip abductor and hip adductor machines. Frontal plane motions in a closed chain or free standing sequence would be side lunges, dumbbell lateral shoulder raises and lateral spinal flexion. Quickness and agility movements made by athletes require adequate frontal plane stability, strength, power, flexibility and balance. Anyone with an interest in training cannot forget its origins but research dictates that we must move beyond the world of open chain hypertrophy training. Understanding how the brain and body function synergistically helps the lacrosse player become more effective on the field and avoid injury.

During your last lacrosse game, were you ever seated? Well, if you answered yes then you were probably on the bench or had just been leveled. Traditional frontal plane exercises/machines are designed to create muscle hypertrophy (increase in size) and strength based on the anatomical origins and insertions of specific muscles or muscle groups. In order to move fast in the frontal plane on the lacrosse field one must train the muscles, more specifically the muscle groups that produce force in this plane of motion. One must also prepare the nervous system (brain) and body to fire off synergistically during these movements. Hard work AND smart work is required to perform better on the lacrosse field-train smart, train hard. The lacrosse player must be concerned with becoming stronger, faster and smarter.

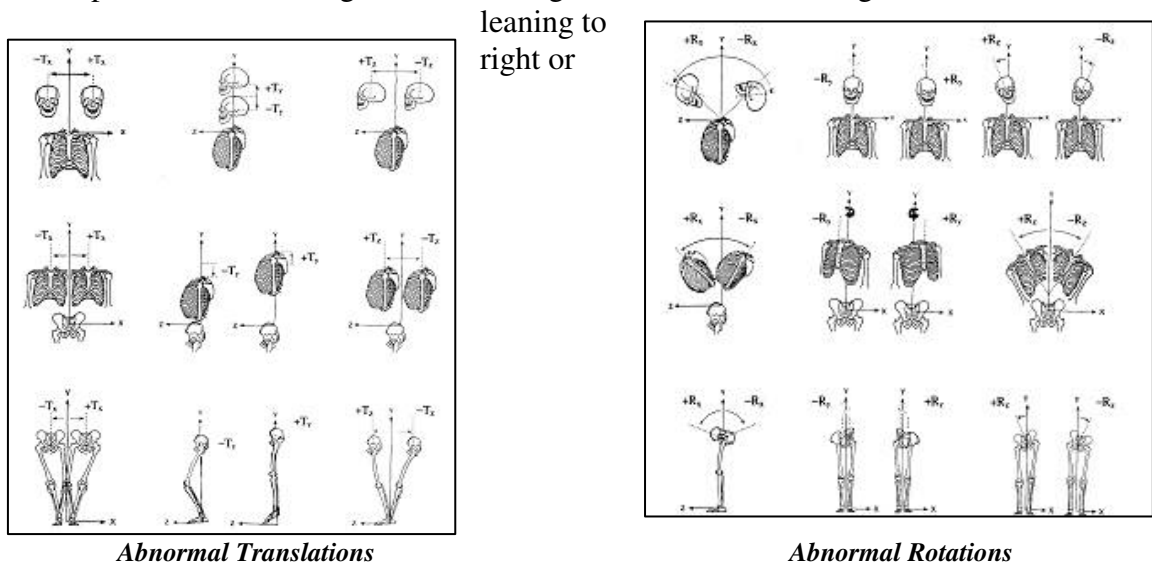
In order to move effectively and produce force in the frontal plane one must focus on training movements in the frontal plane. When the brain and body coordinate to move, the muscles that create that movement are trained. So don't worry that you may not get a pump or feel like you did not work out if your focus is on training movements, not muscles. The easiest example of a frontal plane movement is side shuffling and jumping jacks. When doing frontal plane training, always envision your body moving in between two panes of glass. However, for this article we will focus on training methods as opposed to conditioning and/or running. Traditional lacrosse training and conditioning stresses sagittal plane movements such as sprints, backpedaling, burpees, etc. It is less common to see teams including transverse or frontal plane movements in their training and conditioning, however, most of the game of lacrosse involves explosive movement in these overlooked and under trained planes of motion.

The intention of these articles is to provide a training platform of full body movements in the sagittal, frontal and transverse planes, starting with stability, and then adding strength and power or explosive exercises. Using full body movements in training engages the core and prepares the nervous system for the variety of movements in lacrosse. A training program should always first center on stability. Training without stability is like shooting a cannon out of a canoe. Many athletes are 'functionally dysfunctional' and end up injured or immobile later in life. These

movements must be integrated in the training and conditioning of lacrosse prior to engaging in strength and power movements. Stability can be broken down into static and dynamic. Static stability is also known as posture. This is where all movement begins. Abnormal posture in any plane starts the athlete with an asymmetrical platform for movement. It alters the length tension relationships of muscles and ligaments. Abnormal posture also alters joint position sensors (mechanoreceptors) which diminish the brain's ability to feed back and feed forward information for effective movement. Dynamic stability is symmetry of movement through all degrees of freedom. Abnormal static posture will lead to abnormal dynamic abilities.

Frontal Plane Posture

In any training regime stability must be addressed prior to mobility, strength and power. Movement begins with properly aligned posture. Lateral traumas in lacrosse can cause abnormal postural healing in any plane of movement. The body has extreme capabilities of movement, but when the body heals or develops asymmetrically abnormal posture and dysfunction result. Normal postural alignment creates normal length tension relationships between all the muscles that move the body and the ligaments that hold it together. When addressing posture misalignment in the frontal plane the player needs to be examined from the front or back. The examiner should be looking for lateral displacements of the head compared to the torso, the torso compared to the pelvis and the pelvis compared to the feet; these are the centers of mass of the body. Movement, in general, can be broken down into translational and rotational movements (see illustrations below). Translational movements are straight line movements and rotational movements are circular movements. Rotational movements would be bending side to side. For example, the head leaning to the left or right, one ear would be higher than the other; the torso



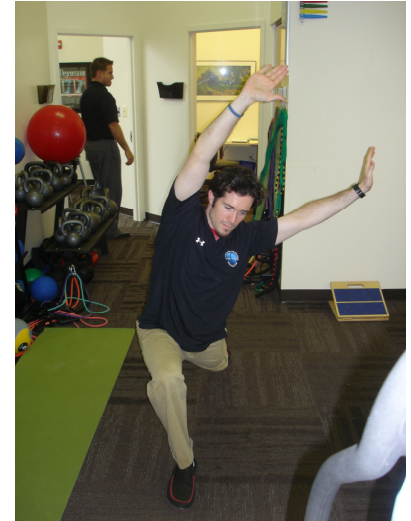
left one shoulder higher than the other. Translational postural misalignments are more detrimental to the body because the center of mass (head, torso and pelvis) shifts to the left or right, this puts abnormal shearing stress and strain on the body's tissues, additionally altering feedback and feed forward capabilities of the nervous system. If the head is translated or shifted to the left or right in a resting posture this alters the upper core's stability. The same stands for the lower body. If the torso is 'stuck' shifted or translated to the left or right it alters the integration of the lumbo-pelvic-hip complex. These abnormal postures also alter the body's kinetic sequencing during shooting, dodging and other movements on the field. This diminishes the ability to play stronger and faster. Frontal plane abnormal postures must be detected and

corrected in order to function efficiently and avoid injury on the lacrosse field. The above information regarding abnormal posture is based on the works of Drs. Don and Deed Harrison of Clinical Biomechanics of Posture. To learn more how to apply mathematical modeling and biomechanics to spine and posture visit www.idealspine.com.

Dynamic Flexibility



Dynamic flexibility has been proven to be more effective in preparing the brain and body for the movements of sport. The following are sample dynamic flexibility movements in the frontal plane.



Strength Exercises

The following are examples of frontal plane strength exercises. The frontal plane lunge is one of the best movements for developing lateral strength. The lacrosse player can use any implement to increase the resistance applied. Pictured is a lateral lunge with a medicine ball and a frontal plane plank. Strength in the frontal plane serves to support the body during sagittal and transverse plane movements. Side planks are another great movement for developing frontal plane strength. The action shot exemplifies the application of frontal plane strength in a ground ball situation.



Power/Explosive Exercises

The following are examples of frontal plane power/explosive exercises. Frontal plane hops dynamically load the lumbopelvic hip complex and core. Power training increases the stretch shortening cycle of the large muscle groups used to create power. Power training involves storing and distributing elastic energy. The goal of power training is to decrease the amortization phase-the time between shortening and lengthening of muscle groups.



Designing your training programs to incorporate multiplanar movements requires a paradigm shift. Challenge yourself to break free from the dogma of open chain hypertrophy training. Your clients and body will thank you. For more information, questions or comments email us at drparis@performancelacrosse.net or call 240-361-2225.