



Biomechanics of Sports

FMS Updates and Changes

April 7, 2020



Lesson: April 7, 2020

Objective/Learning Target:

The student will identify the changes made to the FMS Level 1 screen and be able to further understand and connect to real world application.

Instructions

Read the following passage and answer the follow up questions on the last page. Email to Coach Kolster @ jay_kolster@idschools.org,
tyler_rathke@idschools.org,
marcus_summers@idschools.org

Rotary Stability Movement Pattern

WHY THE REACTIVE TRI-PLANAR PATTERN?

The reactive tri-planar pattern is something we experience when we resist rotation to maintain a position when there is a push or a pull on one side of the body. Rotary Stability (RS) is expressed when we create or resist rotation to crawl, climb, run, swing and throw. In our developmental stages we use the cross connection of opposite arm to opposite leg to crawl. As kids, we learn to climb, run, and bound by expressing this ability.

When heading to the airport, we may need to toss a heavy bag into the car. Many of us naturally will load into a bit of rotation then uncoil to toss it in. This coiling affect is the natural extension of the crossing diagonal pattern that we see in something as simple as walking. If we take a step forward with one leg, the opposite arm should also swing forward. We also depend on the ability to resist rotation when we pick up an object on one side of the body and brace ourselves with the opposite side.

Many sport and recreational movements are heavily dependent on this reactive tri-planar pattern. Whether throwing a punch or a baseball, we need the ability to coil and uncoil the torso to transfer forces to our extremities. We also see this when resisting an opponent in soccer who is trying to push you out of position to get to the ball. Activities like paddling use rotation to perform each stroke.

Resisting rotation is seen on the job when a firefighter drags the firehose over one shoulder to move it closer to the fire. Police officers and soldiers must maintain RS in order to set a steady, precise position to aim a firearm and handle the force when taking a shot.

WHY THE ROTARY STABILITY SCREEN?

The reactive tri-planar pattern is screened with the Rotary Stability screen. This screen is not designed to replicate crawling, even though crawling may be very restorative and corrective for this pattern. It is better to consider this a perturbation challenge. Perturbation literally means an agitation or a loss of balance. The change in base of support when you lift an arm and a leg forces the need for a shift and disturbance to your stability that requires the body to react quickly and communicate using the deeper core musculature to maintain the position.

Not many people practice the unilateral movement seen in this screen and there is an obvious inability to do it when someone fails this motor control challenge. This unique unilateral challenge also allows us to observe the reactive tri-planar on both sides in order to identify asymmetries in this pattern. The opportunity allows us to further explore the pattern to insure it contributes fundamental stability to the movement baseline.

TSPU looks at motor control to see if you sacrifice stability to complete a task. RS looks at a feedback motor control on the left and right side with a perturbation.

Rotary Stability

DESCRIPTION

The client gets into the quadruped position with a board, either the FMS kit board or one of similar size, on the floor between the hand and knees. The board should be parallel to the spine, and the shoulders and hips should be 90 degrees relative to the torso, with the ankles relaxed and plantar flexed with toes pointing backwards.

Before the movement begins, the hands should be open, with the thumbs, knees and feet all touching the board. The client should shift and lift the same side hand and knee to initiate the movement. Then the client reaches back with the hand to touch the same-side ankle. Following the touch, they then flex the shoulder while extending the same-side hip and knee so that it creates a straight line and is in-line with the board on the ground. The hand is brought back to touch the ankle for a second time, then return to the start position. Do not manually manipulate set up positions, but absolutely spot for safety and be aware of possible balance issues that could put the person being screened at risk.

This is performed bilaterally for a maximum of three attempts if needed. If one repetition is completed successfully, there is no reason to perform the test again.

FLEXION CLEARING

A clearing exam is performed at the end of the rotary stability test. This movement is not scored; it is performed to observe a pain response. If pain is produced, a positive (+) is recorded on the sheet and a score of zero is given to the entire rotary stability test. We clear flexion from the quadruped position, then rocking back and touching the buttocks to the heels and the chest to the thighs. The hands remain in front of the body, reaching out as far as possible. If there is pain associated with this motion, give a zero score. If the client receives a positive score, document both scores for future reference.

RS VERBAL INSTRUCTIONS

- Get down on your hands and knees straddling the board with your thumbs, knees and toes touching the board.
- Your hands are under your shoulders and your knees are under your hips with your toes pointing backward.
- At the same time, in one smooth and controlled motion, shift and lift the same side arm and leg.
- Without touching down, reach back with your hand and touch the outside of the ankle.
- Then extend that same side leg backward and arm forward, fully extending knee and elbow.
- Finally reach back to touch the ankle with the hand again, and then return to the starting position.
- Perform this pattern while keeping the arm and leg moving in-line with board.

FLEXION CLEARING VERBAL INSTRUCTIONS

- Get into the same start position with feet pointed backwards, and rock your hips toward your heels.
- Lower your chest to your knees and reach your hands in front of your body as far as possible.
- Do you feel any pain?

SCORING THE ROTARY STABILITY

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- Hand and knee leave ground at the same time.
- Ability to perform this pattern while keeping the arm and leg moving in-line and parallel with the board.
- Fingers touch the lateral malleolus.
- Knee and elbow achieve full extension.



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- Hand and knee did not leave ground at same time
- Inability to keep the arm and leg moving in-line and parallel with the board
- Fingers touch the lateral malleolus
- Knee and elbow achieve full extension



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- Loss of balance
- Hand does not touch the lateral malleolus
- Knee and elbow do not fully extend
- Inability to get into set-up position



An individual receives a score of zero if pain is associated with any portion of this test. A medical professional should perform a thorough evaluation of the painful area.

Follow Up Questions

1. After reading the new rotary stability screen, what is the significant difference between this screen and the previous screen?
2. Why is it important to understand core stability activation when preparing to train a client?
3. List three drills that you would prescribe for a client that scores a 1 on the rotary stability. What exercises would you rule out?