

# Neuromuscular

## Activation

## WARM-UP



St. Vincent  
Sports Performance Center

Robb Rogers  
M.Ed, CSCS, MSSCC  
St. Vincent Sports Performance



Several years ago many highly regarded educators in the field of physical therapy began to expound on the theory that neural recruitment of muscle groups in sequential order is paramount in injury prevention as well as optimal performance. In other words, it is very important for the proper muscles to do the job they were designed to do in the optimal order in relation to the movement skill being executed. Physical therapist Mike Clark, President and founder of NASM is quite versed in this theory and has spent the last several years of his career researching as well as teaching methods in relation to this theory. Over the years many physical educators, athletic trainers and physical therapists have grown to accept this theory.

Most injuries are related to poor technique, muscle imbalances and overuse. However, there have always been those few nagging injuries that occur at the most inopportune time and seem to occur and recur with maddening frequency for no apparent reason. Many times seemingly equal athletes will display a vast disparity in strength, power, speed and summation of force, even when trained similarly and seeming to possess similar genetic potential for performance. What is the piece of the puzzle that when implemented can impact both performance as well as injury prevention? Gray Cook of [www.FunctionalMovement.com](http://www.FunctionalMovement.com), one of the leading physical therapists and educators in this field relates the concept to hardware and software issues. If the injury or symptom is caused by hardware problems, then possibly joint mobilization, chiropractic manipulation, massage therapy and/or surgical ►

intervention is mandated. However, if it is a software problem, then neural recruitment re-training in order to enhance the enervation and contractibility of the muscle group as well as re-coordinate the recruitment pattern may be the key to overcoming that odd or recurring injury as well as provide the spark for peak performance power.

### If we accept the following:

- The center of all power is seated in the lumbo-pelvic-hip complex.
- Power is generated by and from this area.
- This power is expressed from the base of support through the hands, feet or sport implement.
- Therefore, this is the region of the body in which to focus our attention.

### Some general concepts:

#### Movement Control

Back side muscles control front side movement. For example, when you bend at the waist in an RDL movement, this activity is controlled by the backside musculature of the body (calves, hamstrings, glutes and back musculature). Conversely, if you lean back as in a reach back hand stand, this movement is controlled by the front side musculature of the body (anterior calf, quad/hip flexor, abdominal musculature). If we accept this, then inside muscles control outside movements and outside muscles control inside movements. The inside or inner unit muscles are the transverse abdominus, multifidus and the internal oblique. For example, when one leg is supporting the body in a stance and the hip shifts laterally, this movement is controlled by the inner unit above the pelvis and the adductors of the hip below the pelvis. Conversely, when one leg is supporting the body and the knee collapses medially in a valgus maneuver, this movement is controlled by the outer unit musculature which include the Quadratus Lumborum, external oblique, Ilio-psoas above the hip and below the hip the lateral hip abductors, specifically the gluteus medius.

#### Muscle Recruitment

If the correct muscles are not recruited in the proper order to do the job they were designed to do then the software patterns of movement become corrupted with compensation "bugs" that over time can create imbalances that can lead to "-itises" and injuries. Don't misunderstand

me here, as we all compensate from joint to joint in our everyday movements. Compensation in and of itself is not a negative. Compensation is how we move. Compensation is how we perform. The master compensators are the ones that we enjoy watching execute the skills of gymnastics as elite level sport in any form requires movements and forces that put tremendous strain on the human body. What we want to do is create a menu of pre-training/competition exercises that will "re-wire" the software and energize the

neural recruitment pattern of the muscle groups of the body. This "re-wiring" will allow the body to move as fluidly as possible through the joint ranges of motion and movement skill patterns the work bout demands. The beauty of the drills is that they are relatively easy to do, require very little equipment and with minor focus on a few specific techniques these drills can unlock the joint and unleash the optimal movement patterns that will optimize performance in preparation as well as competition. ▶ continue on p.45

## Front Side Activation



### Prone Press Down Scissors

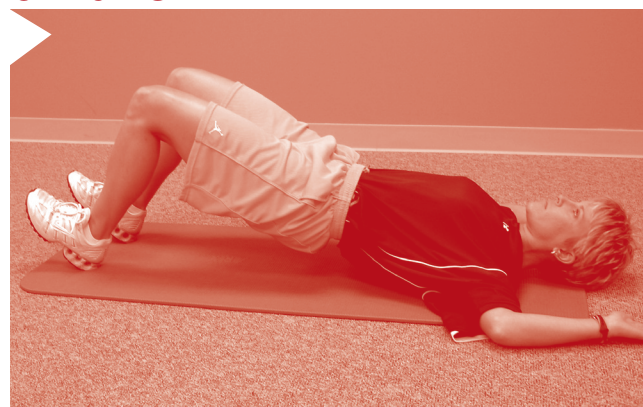
- 1) With Abs "activated" go onto forearms into a prone plank.
- 2) Lift the leg approximately four inches off the ground.
- 3) Keep hips level.
- 4) Do not let hips rotate.
- 5) Alternate sides.

## Back Side Activation

### Bridge Up Series

#### -Two Leg Bridge Ups

- 1) Lift hips up by squeezing glutes together.
- 2) Dorsiflex (toes toward ceiling) ankles.
- 3) Do not hyperextend the back and do not let the hips sag.
- 4) Straight line from shoulder, hip and knee.



### One Leg Bridge Ups Leg Straight

- 1) Elbow underneath the armpit, lift hips up in the air.
- 2) Abduct the top leg without dropping hips and rotating the shoulders.
- 3) Straight line from head, shoulder, hip, knee, and ankle



## Back Side Activation

### Linear Bridge Up Series – Single Leg Bridge Ups

- 1) Lift hips up by 'activating' glutes. 2) Extend one leg without letting the hips drop or rotate. 3) Dorsiflex ankles
- 4) Do not hyperextend the back and do not let the hips sag. 5) Straight line from shoulder, hip and knee.



If you activate the nerves and turn on the muscles, the movement patterns will be cleaner, healthier and smoother. This in turn leads to better quality drills and practices, lowered incidence of injury, increased quality training time which leads to improved performance. After all, better quality of efforts in practice will create higher quality performances. Fewer injuries will increase the number of repetitions performed over time. Better performances help flame the passion for performance and passion creates intense, focused preparation. And as we all know, quality preparation powers championship performance.

For more information on this subject or any other performance or medical issue, contact St. Vincent Sports Performance at (317) 415 – 5747 or via our website [sports.performance.stvincent.org](http://sportsperformance.stvincent.org), the official health provider to USA Gymnastics. ✖

*St. Vincent Hospital and St. Vincent Sports Performance in Indianapolis, Ind., are official service providers to USA Gymnastics. Call 317-415-5747 or visit <http://sportsperformance.stvincent.org>*

## Lateral Abductor Activation

### Rubber Band Drills (1 and/or 2 bands) Shuffle

- 1) Step lateral.
- 2) Do not drag feet.
- 3) Keep both feet pointed straight. 4) Do not turn feet out, lead with the heel. 5) Keep tension on the bands



## Medial Adductor Activation

### Wall Slide Ball Squeezes

- 1) Sit against the wall with hips and knees at 90 degrees.
- 2) Keep back flat against the wall.
- 3) Squeeze ball between knees
- 4) Arms locked straight out, ball at chin level.

