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, 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 “-itis” and injuries. Don’t misunderstand

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**Front Side Activation**

**Back 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.

**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**
  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.

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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 sport.performance.stvincent.org, the official health provider to USA Gymnastics.

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