



# Unilateral- Based TRAINING

Many exercise professionals are shifting the focus of personal training from vanity-driven exercise programs to those which emphasize health and improved quality of life. The general population is in an overall state of health decline; a lack of physical activity combined with excessive sitting and energy-dense dietary practices have created significant problems. Interestingly, the problems are often initiated in the twenties, and by the time people reach forty, most are too heavy, have experienced musculoskeletal inefficiencies and have difficulty performing free-living activities that were once considered easy. When tissues are not used, or overused, they are subject to problems. Postural changes for instance are associated with tightness, weakness, and activation issues. Oftentimes, when people finally decide to do something about

their physical limitations, it is more difficult than it should be to remedy the problems. It conceptually is similar to popular home improvement shows. From the outside, the houses often look aesthetically reasonable, but upon further inspection have all types of structural and wiring issues which must be addressed before the makeover can occur. When personal trainers perform initial assessments they find many people just do not “work right”. Tight hip flexors and hamstrings from eight hours of daily sitting

causes inhibition in the gluteal muscles; which is expressed as an inward knee translation during a basic squat. Likewise, forward chins and shoulders promote thoracic muscle issues, risk for movement limitations and impingement syndromes. All of these problems need to be addressed, just like a house’s structure, before considerations for vanity or performance can be emphasized.

As alluded to earlier, in most cases one muscle does too much while its reciprocal antagonist does not do enough; causing

activation and movement problems. Exercise professionals can make strategic modifications to common activities to fix the primary issues. The concept of reciprocal inhibition plays a key factor in many of these exercises. By identifying the contributing factors, a program can be streamlined to optimize the effectiveness of the effort. Two modifications that are important for an exercise professional to understand in this process are how to employ unilateral with and without asymmetrical loading plans. Unilateral exercises are muscle-isolative, which allows for targeting both ROM and specific muscle activation. Asymmetrical loading allows for improved localized activation and stability. The trick is knowing when to use each. Consider the following examples in the process of program modification using unilateral or asymmetrical activities.

**Bilateral Exercise:**  
**Seated Row**

**Problem:**

*Protracted scapula and limited ROM in shoulder extension/hyperextension*

**Exercise Modification:**

**Single-Arm Seated Row**

When the shoulder complex does not function properly due to upper-body distortions, such as a forward chin or upper cross syndrome, the muscles in the back become weak and lax, whereas the muscles in the front become tight. Bilateral exercises such as the seated row or bent-over row become useless as the limitations prevent proper form. By using a unilateral exercise, greater ROM is attained and the proper muscles can fire allowing for improved strength relationships over time.



Single-Arm Seated Row - Start



Single-Arm Seated Row - End

Unilateral activities combined with asymmetrical loading can provide additional benefit beyond localized improvements in ROM and activation. The mix of stress enhances central and peripheral stability as well as the aforementioned

benefits. For instance, performing a forward lunge while holding a dumbbell overhead, promotes peripheral stability in the shoulder, central stability in the trunk, and lateral stability in the hip. A Bulgarian squat with asymmetrical swing provides

similar benefits. The split stance encourages hip flexor ROM along with glute and quadriceps firing synchronicity. The upswing promotes central stability and posterior upper-carriage activity while also increasing ROM in the latissimus

dorsi and improving medial-lateral sway proprioception. Similarly, the step-up exercise can be used to promote improved glute firing and knee tracking with a lengthy group of positive adaptation-promoting variations. Step-ups with rota-

**Bilateral Exercise:**

**Leg Press**

**Problem:**

*Tight/overactive hip flexors*

**Exercise Modification:**

**Sand Bag (shouldered) Reverse Lunge**

One of the most common musculoskeletal problems among Americans is mild to severe lower-cross syndrome. Sitting all day causes the iliopsoas and rectus femoris to shorten, along with the knee flexors. When the hip flexors become short and overactive they inhibit deep pelvic stabilizers as well as the hip extensors. When the gluteus maximus does not fire properly the whole lower kinetic chain is affected. Switching a traditional leg exercise such as a leg press or back squat to a unilateral movement will allow the pelvis to function better as the split stance increases pelvic stability. Also the asymmetrical loading will help concentrate the load into the desired muscle. This is a multi-benefit modification – the reverse lunge position opens the hip for improved ROM and increases localized activation of the rear-leg glute. With ipsilateral loading of that same leg, the hip extensors experience much greater activation.



*Sand Bag (shouldered) Reverse Lunge*

**Bilateral Exercise:**

**Trunk Rotation**

**Problem:**

*Poor trunk ROM/hip lock (fascial restriction during rotation)*

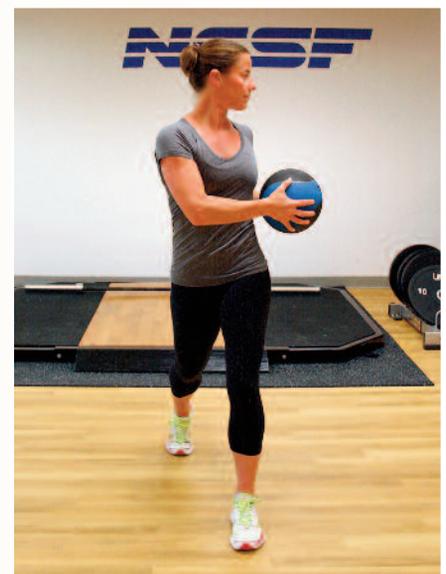
**Exercise Modification:**

**MB Rotation with Step (back or forward)**

Most people rotate the hip rather than employ the trunk during transverse movements, which explains many of the golf swings seen at the country club. Due to the positioning of fascial lines that cross the hip, restriction causes significant movement limitations in the trunk. By stepping forward or backward while rotating across the front leg, the trunk is isolatively activated and mobilized against a stabilized pelvis.



*MB Rotation with Stepback - Start*



*MB Rotation with Stepback - End*

tion, alternating reach, and/or ipsilateral loading can all add unique benefits from the same exercise.

When diversifying exercise selections using unilateral positions and asymmetrical loading each adjustment must be

thoughtfully applied and make sense. Take-home concepts from this discussion include:

**1** Split stances are useful for stabilizing the pelvis and isolating muscle groups for activation or ROM.

**2** Ipsilateral loading is for increasing desired central/peripheral stability or to localize activation.

**3** Heavy asymmetric loading generally challenges central stability, whereas lighter weights and vertical

changes in the center of gravity (COG) are used for peripheral stability focus.

**4** Crossing stable segments with asymmetrical loads promotes ROM whereas uncrossing segments promotes central and lateral stability.

#### Bilateral Exercise:

### Good Morning (GM)

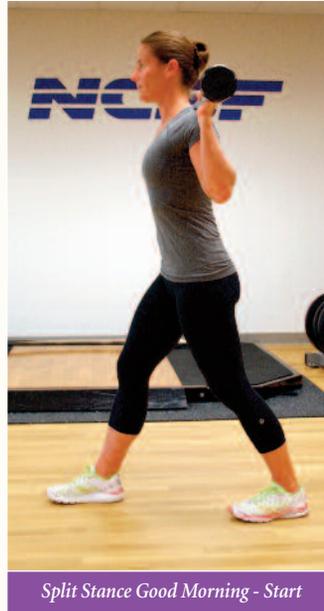
#### Problem:

*Tight posterior chain (e.g., calves, hamstrings, low back)*

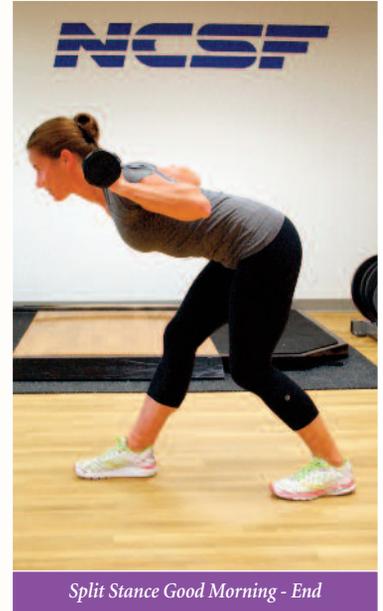
#### Exercise Modification:

### Split Stance GM

Traditional GMs are a mobility exercise that promotes functional strength in the posterior chain when used with appropriate weight and ROM. However, most people are so tight that they cannot lengthen these muscles in a uniform fashion due to disruption in the functional relationship between the gastrocnemius, biceps femoris, and thoracolumbar fascia. Therefore, unilateral hip positioning is useful to prevent any undesirable changes in the spine, hip, and knee that occur within most exercisers. Preventing a round-back position as well as excess knee flexion will aid in improving many issues associated with proper performance of the exercise. Adding a forward reach will also assist in improving shoulder function.



Split Stance Good Morning - Start



Split Stance Good Morning - End

## Improved Measurement of Strength for Maintaining Independence among Older Adults

A new study from the Medical Research Council Lifecourse Epidemiology Unit (MRC LEU), University of Southampton, and recently published in *PLOS ONE* has shed new light on how grip strength changes across the lifespan. Previous investigations have shown that individuals with weaker grip strength during early old-age are more likely to develop problems that lead to a loss of independence and tend to have a shorter life expectancy. Even with the known relationship, there is little data on what is considered “normal” grip strength at different ages. This latest research combined information from 12 British studies that included grip strength readings from 49,964 participants (from 4-90+ years) to produce potential reference charts.

Lead author, Dr. Richard Dodds, Wellcome Trust Research Training Fellow at the MRC LEU at the University of Southampton, comments, “We found that men were typically stronger than women from adolescence onwards, but both men and women reached a peak level of strength during their thirties before becoming weaker with age. We are now clear about the range of normal strength in young adults and have used this information to propose levels below which an older person would be considered to have weak grip strength.” He suggests that doctors and other qualified health professionals could use the information

in this study to help interpret measurements of grip strength and identify those at risk of frailty and loss of independence.

Avan Aihie Sayer, Professor of Geriatric Medicine, at the MRC LEU at the University of Southampton, who oversaw this work, adds, “Sarcopenia, the loss of skeletal muscle mass and function with age, is an area of intense research activity and is being increasingly recognized in clinical practice. Grip strength has been recommended for the assessment of muscle strength in the clinical setting and this study will aid the recognition of important conditions such as sarcopenia and frailty.”

#### Quick FACT

Individuals with weaker grip strength during early old age are more likely to develop problems that lead to a loss of independence and tend to have a shorter life expectancy.

