An emerging trend known as **Loaded Movement Training (LMT)** is an effective way to help clients develop total-body strength and muscle definition by training all of the muscles together as one system. LMT is movement-based resistance training that combines full-body, task-oriented movement patterns with load.

When engaging in Loaded Movement Training, every time you move, you are integrating the entire structure and the entire body in every movement you do. Every exercise becomes a core exercise, every exercise becomes a strength exercise, and every exercise becomes an agility exercise, to take into account the movement and energy demands of life and sport.

The Loaded Movement Training originator found, when his colleagues developed strength and fitness programs for hockey athletes, that farm kids had distinct advantages. These young athletes were “faster on the puck, stronger in front of the net when battling their opponents, and more balanced in odd body positions”. (Dalcourt 2013)

As they worked with young hockey players, the strength differences between farm kids and city kids became so pronounced that they felt compelled to scrutinize what the farm kids were up to.

“Farm kids did not have fitness training as they grew up. They had chores—throwing hay bales, hoeing weeds, herding livestock and so forth. And because chores must be done every day, these kids exemplified the bedrock principle of LMT.” (Dalcourt 2013) LMT is defined as consistently combining an external load with specific, task-oriented motions to strengthen the body in ways that do not happen with standard weight training or body weight exercises.

Loaded movement training can be a missing link in rehab and conditioning. Our bodies evolved to move with loads. Perhaps we should include more loaded movements in our rehab programming.

History

LMT can be defined as a technique that combines whole body movement patterns with loads/resistance. Conventional strength training exercises often use weight machines that control the path of the weight, or free weights such as barbells or dumbbells. Traditional free-weight exercises typically take place in a single plane of motion where muscles work to generate force directly against the downward pull of gravity.

This training with moderate-to-heavy loads for a number of repetitions has been the accepted method for improving muscle size and definition (hypertrophy). However, recent research indicates that using lighter loads while moving in a variety of directions at different velocities may be the most effective method for developing integrated strength throughout the entire myofascial network. (Mohamad et al, 2012)

Muscles control two different types of forces moving through the body: compressive forces, which create muscle shortening, and tensile or strain forces, which result in muscles lengthening (Myers, 2009). The balance between these two forces means that as muscle tissue on one side of a joint is shortening, the tissue on the opposing side experiences tension and strain as it is lengthened. While most traditional exercise machines focus on creating compressive forces within a muscle, it is actually the lengthening of the elastic fascia and connective tissue as a result of tensile forces that is responsible for producing the mechanical energy necessary for movement (Myers, 2009; Verkoshansky and Siff, 2006).

Benefits

The benefits of Loaded Movement Training include:

- Integration of systems of the body such as: muscle, fascia sheath, connective tissue, nervous and skin. (The largest organ in the body, skin is very elastic and multidirectional exercises can help improve its elasticity and appearance.) (Davids 2003)
- Improves strength and muscle hyupertropy. A light weight at high speed is the best stimulus to increase strength and muscle mass (Mohamad et all, 2012).
- Lower compressive forces on the joints and skeletal structures of the body.
- Increases tension in the fascia instead of the joints.
- Using a variety of loads combined with different starting positions and movement patterns can improve multidirectional stability, mobility, strength and power.
- Reduces the effects of aging.

Muscle Activation

The stimulus of different lines of stress in loaded movement offers the right amount of variability to build strong, stable bodies that are mobile and resilient. This type of training can be a key component of a well-balanced therapeutic protocol.

Integrating multiple-joint motions moves stress away from specific areas in the body and introduces stress to the whole system as it shares the load.

Task-oriented, full-body motion patterns happen when the entire body is used to move from one point to another: working around the garden, loading a dishwasher, taking a child out of a carseat, playing a sport or performing any full-body activity.

Applications of External Loading

Moving with external loads subjects our bodies to various “lines of stress” that trigger the remolding of tissue. Most training moves external mass along linear patterns. While this has tremendous benefit, the stimulus is incomplete.

Think of multiple, variable lines of stress introduced to a body throwing hay bales versus a repeated set of biceps curls. Both can be tremendously beneficial and lead to function and performance gains. But studies have found that loaded movement training challenges and conditions muscle, fascia, the nervous system, skin and other systems of the body (Hinz 2013; Leonard 1998; Shanahan 2009; Siff 2003). The intention is not to replace current training methods with loaded movement training, but rather to add loaded movement training into a protocol.

Generic Land-Based Examples

The barbell squat requires an individual to set his or her feet in parallel and maintain spinal extension and a symmetrical alignment in the hips, while lowering and raising the barbell against gravity. Compare that to a woman spending the day working in her garden; as she's digging in the dirt she will be performing a variety of different squats with her feet and hips in a variety of different positions. Doing perfectly symmetrical squats in the gym will help improve strength in a specific pattern with an emphasis on concentric muscle action, but it won't adequately develop her ability to use her fascia to produce and mitigate forces across the entire network, which is what actually happens as she's going about her chores.

In another example, consider how most parents pick up their kids off of the ground; they don't take the time to set their feet in a neutral position, position their perfectly still child symmetrically position relative to his or her midline and then, after bracing, symmetrically load each arm as they pull the child to their chest. As most parents will tell you, there is no cognitive thought relative to their body position as they perform the movement of picking up their child. They simply hold on to their child however they can and lift him/her to whatever position is manageable at the time. These two examples briefly demonstrate that, whether in sports or activities of daily living (ADLs), the only constant in human movement is continuous variability.

Loaded movement training can be used to apply constant variability by manipulating the direction, distance or speed of an exercise.

Athletic Land-Based Application

This concept applies to athletes as well; the trend of the past number of years is to train athletes in "functional" movement patterns specific to the demands of their sport. Regardless of what sport an athlete is preparing for, the likelihood that they will perform exactly the same movements exactly the same way in every practice or competitive situation is extremely small. During competition, athletes have to constantly adapt their body movements to the locations of both their teammates and opponents. Research indicates that high-performing athletes depend on constant movement variability to achieve success. Time-motion analysis studies indicate that even at the highest levels of performance, many athletes do not perform successive movements exactly the same way. In fact, the highest-level performers actually demonstrate a wide variance in movement patterns when executing a play (Hamill, Palmer and Van Emmerik, 2012; Barlett, Wheat and Robins, 2007; Bartlett, 2008; Stergiou, Harbourne and Cavanaugh, 2006). Loaded movement training allows athletes to develop sport-specific strength by using variable, high-velocity movements corresponding to game-like situations. This helps them to have a greater carryover effect from the conditioning room to the competition arena (Mohammed et al., 2012; Timmons, 2010).

Therapeutic Application

How do we implement this concept in our sessions? After studying LMT research and articles, I believe LMT combines two techniques we're already familiar with: PNF and Asymmetrical Loading. So …

1. Go back to Terri Mitchell's PNF in the water manual and DVD. LMT is ALL PNF patterns. PNF is the original and natural multiplanar exercise plan.
2. Add Asymmetrical Loading (resistance, weight or buoyancy). Use equipment on only one leg or one arm OR use different loads on each side.
3. Teach stability during these asymmetrical PNF movements.

Progress by removing the load, change the beginning position of the exercise to the end position, stop partway through the movement, or change directions

Try these exercises (and while you're trying them you'll be able to think of more):

- Bilateral UE PNF patterns with asymmetrical loads (resistance, weight or buoyancy). Vertical or horizontal position.
- Unilateral LE PNF as above.
- Bend hips and knees as you turn left with a UE PNF pattern, then straighten (extension) with spinal rotation.
- Squat using UE bilateral horizontal (transverse) adduction/abduction with both arms going the same way.
- Reach left with both arms while walking forward with the head turned R. Reverse.
- Take laundry out of the dryer and put it up on a high shelf.

Tennis Example

Equipment:

buoyant cuff on dominant forearm and ankle

Parachute strapped to non-dominant leg (shorten to 6 – 8" of drag)

1. Jog R diagonal (to the net)
2. Hop straight back on R foot while L foot swings diagonally with dominant arm overhead
3. Crossing jog to L while reaching both arms across body ready for backhand
4. Back hand swing (both arms) forward while stopping and stabilizing on dominant leg

Think of other Golf swing, baseball, tennis and soccer applications that work for you and your clients and then Have Fun!

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