

## **UNDERSTANDING JOINT STABILITY, FLEXIBILITY, AND MOBILITY**

Increase your flexibility; that's what so many active individuals hear as a common cause of muscle or joint pain. And for many this appears to be an obvious answer and quick fix; all they have to do is stretch more. However, for those who have attempted to increase flexibility through stretching, oftentimes they become keenly aware that just being more flexible doesn't always reduce pain or improve performance. Likewise,

those who have gained exceptional flexibility often times struggle with the exact same pain and limitations. So, in spite of stretching, stretching, and more stretching, when the pain and functional limitation continue, many get frustrated and simply continue to push through on going pain and limitation.



Although pain and limitation occur quite frequently in the active population, oftentimes most don't realize that flexibility is only one factor in a laundry list of items that can either limit the motion of a joint or can likewise completely destabilize a joint. Either of these two can produce pain and functional limitation. In other words, it's more complex.

By simple definition, flexibility is the ability to move a joint or a series of joints through a full and unrestricted range of motion. In other words, flexibility is a person's individual ability to move free from restriction. However, because flexibility also involves the joint itself, the ability to move a joint depends on several non-muscular factors. In other words, stretching alone won't always fix a functional motion limitation nor will it always eliminate the pain.

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### **Joint Stability**

Much like winning or losing a sporting event is a result or culmination of several independent and highly variable factors, joint stability is really no different. Several individual components have to come together to arrive at a place of true joint stability. The design of the bone itself, the integrity of the cartilage and restraining ligaments, as well as the strength and performance ability of the surrounding musculature all affect the joint's ability to maintain its congruency.

Provided that there are no injuries or defects in the bone structure, the cartilage, or the ligamentous tissue; joint stability then boils down to an issue of the surrounding musculature's ability to not only contract, but to likewise stabilize and support the joint. In other words, stability becomes a function of muscle strength. As such, it now becomes really quite simple to understand how flexibility and stability really interact.

#### **Consider the following:**

- If Strengthening is grossly greater than Stretching...  
...Tightness and motion limitation will result.
- If Strengthening is slightly greater than Stretching...  
...Stability will be the result.
- If Strengthening and Stretching are equal...  
...No change will be the result.
- If Stretching is slightly greater than Strengthening...  
...Flexibility will be the result.
- If Stretching is grossly greater than Strengthening...  
...Joint instability, pain, and limitation will result.

In summary, provided that all other factors contributing to joint stability are nominal, the ratio of muscle strengthening to muscle stretching will greatly affect the stability, functional capacity, and performance of a joint. In other words, strengthening may be more valuable than flexibility in fixing the problem.

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## Flexibility

As previously stated, flexibility is the ability to move a joint or a series of joints through a full and unrestricted range of motion. However, not all flexibility is the same. Muscles are dynamic structures that contract and likewise relax. As a result, although lengthening the muscle through a simple static stretch may increase flexibility and motion, that increase in motion does not always correlate to an increase in performance.

### **Static Flexibility**

By distinction, static flexibility is basically flexibility at rest. The muscle isn't under any load or stress from any activity other than the stretch itself. Provided the stretch is applied gently, then the muscle will respond, relax, and stretch. Although static flexibility is great for steadily increasing joint range of motion over time; because it is flexibility at rest, static flexibility doesn't totally correlate to improve performance in dynamic activities such as sprinting, hurdles, or long jumps.

### **Dynamic Flexibility**

Given a proper warmup (i.e. sweating), dynamic stretching is usually performed at the beginning of a workout or prior to competition much like static stretching. The distinction however, is that dynamic stretching prepares the muscles involved to be able to stretch and contract in alternating fashion, thus closely mimicking the movements made during exercise or performance. Likewise, instead of static stretches that move a joint to its end range and hold for 8 to 10 seconds, dynamic stretching is moving the joint back and forth from its mid-range to its end range without a distinct hold time at end range. As a result, dynamic flexibility better mimics competitive action and better prepares the muscle for dynamic activity. For more information on this topic consider reviewing our November 2014 Newsletter: Stretching for Competition. As always, all past editions of Sports Medicine Monthly are archived on our website at no charge.

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## Joint Mobility

Whereas stability refers to the ability of a joint to maintain its position, the mobility of a joint is defined as the degree of range of motion in a joint. In other words, stability deals with joint position and mobility deals with free range of motion. Predominantly, this is where bony injury, cartilage tears, or ligamentous damage become involved. In other words, when considering a joint's ability to move, we strip away the musculature and look directly at the integrity of the joint and its corresponding structures instead.

For example, chronic ligamentous injuries or acute ligament tears are a very common causes of joint destabilization. As ligaments are designed to hold a joint stable, any injury to a ligament will render the joint unstable. As a result, injuries to joint-restraining structures, such as ligaments, will increase the mobility of a joint to an excessive and dangerous level. When this type of injury occurs, the body begins searching to find options to increase stability through some other means. Oftentimes, this is where rehabilitation and bracing can sometimes be successful.

On the other hand, for those who are looking to increase joint mobility, again, provided that the joint and its restraining structures are intact and uninjured; then gaining flexibility really is a great way to accomplish such. However, if pain and functional limitation persist over a period of time in spite of consistent stretching, then flexibility is most likely not the problem. As such, examination by a Central States Orthopedic Specialist or Athletic Trainer is the best way to get the answers that your looking for. We'll show you how you can improve your flexibility, increase your stability, and maintain your mobility all at the same time. In other words, we'll make sure that you

Get Seen, Get Heard, and Get Better.

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