

LECTURE 9

Goal Setting

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- **Stretching**
- **Reciprocal Inhibition**
- **General Warmup**
- **Cooldown**

Stretching

Stretching is a really important, and beneficial thing for us all to do. However, too often many of us leave it out of our sessions in favour of a bit more training.

- So what are the real benefits?
- Why should we make stretching a priority in our sessions?
- And what type of stretching is best for your clients, and for each section of the workout?

Here we will look at the different types of stretching as well as their specific benefits and highlight why we should be placing more emphasis on stretching to ensure our clients' progression.

Flexibility is the ability to move through a range of movement at or around a joint.

In order to find the value in flexibility, and for our clients to see this too, we must understand the potential impact flexibility can have on our client's lives, health, general wellbeing, and of course their fitness.

We should also explore how a lack of flexibility can adversely affect them.

For example, poor flexibility can limit the effectiveness of the exercises we are performing, leading to limited results. Limited flexibility can be debilitating in terms of posture and create muscular compensations. It can lead to adaptive shortening and inefficient movement patterns. It is very easy for us to suffer with issues such as those listed above based on leading sedentary lives, desk-based posture and other lifestyle factors. If we can recognise these things early enough, we can hope to improve them.

There are a number of benefits that come with stretching.

Let's take a look at some of them...

- Increased range of motion.
- Decreased injury risk
- Reduction in DOMS (delayed onset muscle soreness).
- Increased relaxation.
- Better circulation.
- Improved posture.
- Reduced back pain.

There are also lots of factors that can affect our ability to stretch, such as...

- Temperature.
- Gender.
- Age.
- Training history.
- Connective tissue.
- Joints.

The muscles have a built-in system to ensure they stay safe where force production and length-tension are concerned.

The primary ones are **muscle spindles** and **Golgi tendon organs (GTOs)**.

Spindles run along the length of a muscle fibre, detecting length changes, and rate of occurrence, feeding this back to the nervous system. If a muscle is stretched too far, or too quickly, it causes a stretch reflex resulting in a contraction to shorten the muscle.

GTOs, located in the musculo-tendinous unit, relay information regarding tension within the muscle that may prove to be a problem. Excessive tension will result in muscular relaxation to prevent damage. This is known as autogenic inhibition and protects the muscle and tendon from injury.



Reciprocal Inhibition

Reciprocal inhibition (RI) occurs whenever a muscular contraction takes place. It is a direct response from an antagonist muscle to an agonistic contraction. For example, in a bicep curl, as the biceps contract to draw the hand towards the shoulder, the triceps must relax and lengthen to allow the contraction to take place.

This is a natural process that happens all the time to enable us to move, but there are instances in which it can be detrimental.

In an instance where we have a particularly tight muscle, usually caused by poor posture, we can see that this muscle's antagonistic partner becomes very difficult to recruit by the nervous system. This can cause more issues in instances when we want to recruit this muscle as an agonist (ie to contract), and may lead to more muscular compensations. Imagine a chronically tight hip flexor, which may cause an RI signal that inhibits glute contraction. This would be detrimental if for example, you wanted to run or squat, and may lead to over-reliance on other muscles by way of compensation.

It is important to remember that RI signals are imperative to our normal movement and in terms of stretching we can utilise contraction of an agonist to assist stretching the antagonist muscle and re-establish an appropriate length-tension relationship between the two.

Static



Static stretching is a stationary form of stretch that should be performed post-exercise – There can be a reduced muscular force capacity following static stretching which means we keep it for after the session. A muscle is taken to a point of comfortable tension and held for 10-30 seconds. Longer-duration stretches are known as developmental stretches and may feature multiple reps and achieve greater range of movement over time, whereas static maintenance stretches are held for around 10-15 seconds.

Dynamic



Dynamic stretching is best performed at the start of a session as a part of the specific warmup, following a more general cardiovascular warmup. This type of stretching involves taking a muscle group through a dynamic range of movement, ideally one that is similar to that which they will use in the workout. For example, to stretch the quadriceps and glutes you could perform bodyweight squats and lunges.

Balistic



Ballistic stretching involves using powerful movements, counter-movements and momentum. They can help prepare you for a session that requires explosive activity, power production and plyometrics. However there is an increased risk injury associated with ballistic stretching of due to the higher intensity so they are best reserved for more athletic populations.

We are now going to look at where stretching fits in to your sessions by looking at the process of warming up and cooling down.

General Warmup

This type of warmup includes the use of general pulse-raising movement. You might choose to perform a 5-10 minute progressive session on the rower or the treadmill to warmup the cardiovascular system as well as lots of the body's major joints. It will raise the heart rate without targeting specific joint actions, or muscle preparedness, which can be taken care of in the specific warmup.

Specific Warmup



This type of warmup utilises similar movements that are to follow in the main workout. This ‘movement prep’ will enhance the neuromuscular pathways and prepare the client for the specific range of movement (ROM) needed to perform well. It also ensures the movement patterns have been practised by the muscles and the nervous system prior to being loaded with weight, which will prepare them better for the greater intensity they are going to work with.

Mobility



There is a difference to observe here between dynamic stretching and mobility exercises. Dynamic stretches are designed to put the muscles through a full and specific ROM, based on the demands of the session ahead. Examples are squats and lunges. Mobility exercises are more targeted at ensuring the joints have adequate ROM and enhanced synovial fluid production ahead of the workout. Examples include shoulder rolls arm swings and ‘hip opening’ exercises.

The above process should be followed in the warmup as it allows a graduated approach to start the session. We go from generally increasing body temperature to more focused stretching for specific areas. A warmup should ensure...

- Warmer muscles and overall body temperature
- Increased elasticity of muscles and connective tissues.
- Cardiovascular and energy system preparation.
- Smoother movement through enhanced nervous system impulses.
- Improved joint lubrication.
- Higher force production based on preparatory recruitment.

Cooldown

The purpose of the cooldown is to return the body to its pre-exercise state in terms of heart rate and breathing rate. It is there for the prevention of blood-pooling and possible delayed onset muscle soreness (DOMS).

There are a couple of phases to this...

- Pulse-lowering exercise.
- Static stretching.

Cooldowns will generally feature static stretching rather than dynamic as we are no longer in need of 'functional flexibility', but instead need to elongate the tissues that may have incurred incidental shortening.

Let's have a look at the process as well as some of the subcategories of this type of stretching. You may choose to perform a 'pulse-lowering' exercise immediately following the main workout, and ahead of stretching – particularly if the main session has been intense. This will allow you to initially halt any potential blood-pooling issues, but also to start to flush away any by-products created from the session. You can perform your pulse-lowering exercise on a piece of cardiovascular (CV) equipment, or just in some space on the gym floor. It should include gradually-lowered intensity to return the heart rate and breathing rate to normal.

Maintenance

10-15 seconds is considered an adequate timeframe to hold a position during maintenance stretching. We can perform one or two sets and keep in mind we are seeking to return the muscles to pre-exercise state, rather than achieve long-term elongation of the tissue.

Developmental

Developmental stretches are designed to enhance the ROM in a given muscle. They are held for longer than maintenance stretches - usually around 30-seconds or more, possibly using multiple reps. Typically, we are trying to incrementally increase the stretch as we go along with this practice.

There are instances, particularly with chronically tight muscles, that you may utilise this type of stretching pre-session with a client. Be aware that this may limit the force capacity of the muscle ahead of the session, and for this reason you should perform dynamic stretches following this practice to prepare for the session ahead.

Active & Passive

Active stretching involves moving in and out of a position of stretch using your own effort to stretch the agonist muscle. For example, you can achieve a good hamstring stretch using the quadriceps to assist in extending the leg. The greater contraction results in enhanced relaxation of the hamstring through reciprocal inhibition and can also have the added benefit of enhancing the length-tension relationship between the agonist and antagonist muscles.

Passive stretching is a more relaxed form of stretching in terms of your own efforts. For this you may use an external force rather than your own effort to assist in enhancing the stretch. This may be a partner, a PT, a solid obstacle such as a wall, or a band or strap that will assist in the stretch.

PNF

Proprioceptive Neuromuscular Facilitation (PNF) stretching is especially effective at enhancing the ROM of a muscle that is chronically short / tight. The muscle spindles, as you know, relay the state of stretch to the nervous system, meaning the nervous system will be informed on the current state of stretch and how quickly this was achieved. We are attempting to activate a response based on the creation of tension following this point of stretch. The client will put a little effort against the trainer in order to create some muscular force. This shouldn't be a maximal contraction. This will create feedback from the Golgi tendon organs around the tension experienced. We then instruct the client to cease the contraction and take a deep breath. Upon release we increase the stretch slightly. The lack of force production should allow a deeper stretch to take place.

Myofascial Release

It may be beneficial to include myofascial release techniques, such as foam rolling, in your client's cooldowns in order to assist recovery and to lower the intensity of soreness.

Fascia is a connective tissue that surrounds the body's soft tissues. Trauma, such as that experienced during exercise, can lead to restriction in the fascia tissue that may alter muscular movement patterns. Foam rolling may help to restore the length and pliability of the fascia tissue, improve the recovery of other connective tissues, and lower the incidence of tenderness, to aid the recovery process.



Generally speaking, most people will be completely safe to perform stretching of any variety. However, there are some things that you may want to be aware of.

- **Forcing a stretch** – muscles need to relax in order to stretch. Forcing a muscle beyond what is comfortable can lead to injuries..
- **Cramping** – If you suffer a cramp, it's best to stop the stretch.
- **Inflammation** – areas of inflammation should not be subjected to stretching.
- **Pain** – we should not be experiencing pain when stretching, only mild discomfort, so do not stretch through pain.
- **Injury** – be careful when stretching if your client has an injury on a specific part of the body.