

STRETCHING

By Leith Darkin

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Abstract

In this article we are going to look at the various forms of stretching as well as where and how to implement stretching into your training program. We'll also take a brief look at some of the latest research on stretching and warming up to help you put together effective warm up routines.

TYPES OF STRETCHING

STATIC STRETCHING

Static stretching is where you lengthen a targeted muscle group to the point of slight discomfort/tightness, then hold for a period of around 20 - 30 seconds. After holding your static stretch for 20 – 30 seconds, the slight discomfort/tightness you originally experienced should have dissipated allowing you to further lengthen your targeted muscle group. This sequence of lengthening to the point of slight discomfort/tightness and holding can be repeated until no further lengthening can be achieved without considerable discomfort.

PNF STRETCHING

(PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION)

PNF stretching is where you lengthen a targeted muscle to the point of slight discomfort/tightness, then contract the targeted muscle group isometrically for approximately 6 seconds. After your isometric contraction, the slight discomfort/tightness that you originally experienced should have dissipated, allowing you to further lengthen your targeted muscle group. This sequence of lengthening to slight discomfort/tightness then contracting isometrically for 6 seconds is repeated until no further lengthening of the targeted muscle group can be achieved without considerable discomfort.

PNF stretching is more often than not performed with a partner, your partner takes your joint through its range of motion to the point of slight discomfort/tightness then holds the limb while the you contract isometrically against your partner. With a little imagination you can perform PNF stretching on your own however for simplicity, it's easier to perform with the help of a partner

DYNAMIC STRETCHING

Dynamic stretching is where you fluently take joints through their natural ranges of movement; this loosens the muscles that surround the joints allowing the joints to move more freely.

Dynamic stretching can be broken down into 2 subcategories.

- 1) **General.** A non-specific routine where dynamic movements are designed to loosen up joints.
- 2) **Sport Specific.** Where dynamic movements replicate the actual sporting movement that is about to be undertaken. Sport specific dynamic movements may not be as fluent as “general” dynamic movements, as sporting movements are often performed in an explosive manner to produce power.

WHEN TO INCORPORATE A STRETCHING ROUTINE

- 1) As part of a warm up routine before a training session or sporting contest.
- 2) As part of a cool down session immediately after a training session or sporting contest.
- 3) As part of an active recovery, usually the day after a training session or sporting contest.
- 4) As part of a training phase specifically designed to increase the range of motion in joints.
- 5) As a part of an ongoing maintenance program to keep your muscles healthy.
- 6) As part of an injury rehabilitation process.

WHAT TYPE OF STRETCHING ROUTINE DO YOU USE?

A warm up routine before a training session or sporting contest.

Athletes have been using stretching routines as part of their warm up for many years now, the rationale for this is stretching is believed to reduce the chances of injuries and increase sporting performance.

I’ve read through many articles over the years and attended conferences and lectures where these issues have been addressed and the general consensus is that.

- 1) No studies have been able to prove undoubtedly that static stretching reduces injuries in athletes when used as a warm up.
- 2) A 5 -10 minute aerobic warm up designed to raise the bodies temperature, making your muscles more pliable has proven to be more beneficial in reducing injuries than static stretching alone
- 3) Static stretching after a 5 -10 minute aerobic warm up hasn’t proven to be more beneficial than a 5 –10 minute aerobic warm up alone.
- 4) Research over the last few years is suggesting that prolonged static stretching reduces strength and power anywhere from 10% - 40% depending on the duration that each static stretch is held for (remember most competitive martial arts are strength and power based).

Current research is leaning towards a 5-10 minute aerobic warm up followed by a sport specific dynamic stretching routine where athletes replicate the sporting movements about to be undertaken. Each sport specific movement can be repeated around 10 – 20 times starting off at a low intensity then progressing to higher intensities where the sporting movements place the muscles surrounding the moving joints under a brief stretch.

A cool down routine after a training session or sporting contest.

After a strenuous training session or sporting contest muscles can become stiff and tight. A light aerobic cool down of around 5-10 minutes is generally recommended to help with the removal of accumulated lactic acid. After your cool down a low intensity static or PNF stretching session can help to alleviate some of stiffness and tightness within the muscle fibers, assisting the recovery process.

(There are other effective means of recovery you may be interested in further researching such as contrast showers, icing, and massage).

An active recovery the day after a training session or sporting contest

We've all woken up stiff and sore after a good training session or sporting contest, just like our cool down process your body can benefit from a light aerobic session of around 5-10 minutes to elevate our body temperature (making your muscles more pliable) followed up with a light to medium intensity static or PNF stretching session. Stretching will help to relieve some of the stiffness and tightness within the muscle fibers, when muscles are stretched back to their resting length. (Massage again can also aid in recovery).

A training phase specifically designed to increase your flexibility.

There are many martial artists who have developed above average ranges of motion in their joints when a 5 – 10 minute static stretching routine is incorporated into their warm up before class. There are also many martial artists who have below average to average ranges of motion in their joints when a 5 – 10 minute static stretching routine is incorporated into their warm up before class. There are 2 main reasons for the variations in flexibility in these 2 groups of martial artists.

- 1) The range of motion achieved in joints can be a genetic factor.
- 2) Some martial artists turn up to training 4 – 5 nights a week and put in 100% into their training (warm up and stretching included) where other martial artists turn up to training 1 – 2 nights a week and just go through the motions.

If you are looking at increasing the range of motion in your joints, you are better off addressing your flexibility training the same way you would address your strength training, endurance training etc. You need to put aside 3 – 4 days a week where you can spend around 20 – 30 minutes specifically developing your flexibility.

When looking at increasing the range of motion in joints static stretching or PNF stretching can be used.

STATIC STRETCHING

When using static stretching to increase the range of motion in your joints, you first need to raise your body temperature with a light 5 – 10 minute aerobic warm up. After your warm up, you then lengthen a targeted muscle group to the point of slight discomfort/ tightness, you then hold this position for a period of around 20 - 30 seconds or until the slight discomfort/tightness you originally experienced dissipates. At this point you further lengthen your targeted muscle group until the slight discomfort (or tightness) re appears and again hold this position for another 20 – 30 seconds or until the slight discomfort/tightness again dissipates. You continue this pattern until no further lengthening of your targeted muscle group can be achieved without considerable discomfort, at this point you are at your targeted muscle groups “end range of motion”, you then hold this position for ideally 2 – 3 minutes then move onto another muscle group.

PNF STRETCHING

When using PNF stretching to increase the range of motion in your joints, you first need to raise your body temperature with a 5 – 10 minute light aerobic warm up. After your warm up, you then lengthen a targeted muscle group to the point of slight discomfort/ tightness, then contract your targeted muscle group isometrically for approximately 6 seconds. After your isometric contraction, the slight discomfort/tightness that you originally experienced should have dissipated allowing you to further lengthen your targeted muscle group. This sequence of lengthening to the point of slight discomfort/tightness then contracting isometrically for 6 seconds is repeated until no further lengthening of the targeted muscle group can be achieved without considerable discomfort. At this point you are at your targeted muscle groups “end range of motion”, if you are looking at increasing your current range of motion, at this point I recommend that you then hold a static stretch for around 2 – 3 minutes then move onto another muscle group.

When looking at increasing the range of motion in joints you need to get to your targeted muscle groups “end range of motion”, then hold this position for a reasonable length of time (ideally 2 – 3 minutes). The main difference between static stretching and PNF stretching is PNF stretching will generally get you to your targeted muscle groups “end range of motion” in a shorter length of time than static stretching.

An ongoing maintenance program

An ongoing maintenance program where a light to medium intensity stretching routine (static or PNF) is performed several times a week will.

- 1) Help to keep your muscles healthy and your joints moving freely
- 2) Help maintain posture
- 3) Help to reduce injuries to muscles that surround highly mobile joints such as the hip and shoulder joints.

Injury rehabilitation

When going through a rehabilitation program for muscle and connective tissue injuries, Physiotherapists, treating physician's etc. nearly always incorporate stretching into the rehabilitation program. Depending on the severity of the injury, rest is often prescribed, resting allows the injured area time to heal in an environment that won't interfere with the healing process. Unfortunately resting often results in shortening of the muscles in the effected area (just like the saying "if you don't use it, you'll lose it'). When dealing with this situation, physiotherapists, treating physicians etc. will warm up the clients effected area with a heat pack or gentle massage (this raises the temperature of the affected area making the muscles more pliable) then use PNF stretching and or static stretching to help maintain or increase the range of motion in the injured area.

GUIDELINES FOR STRETCHING

- 1) When incorporating a training phase specifically designed to increase the range of motion in joints, a "periodized program (a program of varying Intensities) is recommended.
- 2) If you are specifically looking at increasing the range of motion in your joints you will have to incorporate some high intensity stretching into your program. A high intensity stretching session needs to be followed up with a low – medium intensity stretching session, not another high intensity stretching session.
- 3) When performing high intensity stretching, you will need a qualified trainer or coach involved in your first few sessions to show you how much intensity is enough and how much intensity is too much. You will also need guidance as to the acceptable ranges of motion in each joint. Remember, more mobility means less stability
- 4) All forms of stretching require some form of a warm up to elevate the bodies temperature, making the muscles you are about to target more pliable and easier to stretch. Warm ups include a 5 – 10 minute light aerobic workout, heat packs (when treating injuries) and hot baths or hot tubs. Hot baths and hot tubs are great for increasing the range of motion in joints, you can either sit in a hot bath or hot tub for 5 – 10 minutes then get out and stretch, or stay in the hot bath or hot tub and stretch in the hot water. Be careful not to over stretch in hot water, the heat from the water makes your muscle fibers incredibly soft and pliable allowing you to achieve greater ranges of motion.
- 5) When using static or PNF stretching for a cool down or an active recovery make sure the muscle groups you are targeting are only stiff and tight. If the muscle group you targeting is actually injured (e.g. torn), stretching can further damage the injured muscle or muscle tendon.

- 6) When performing a “general’ or a “sport specific” dynamic stretching routine, each movement is repeated around 10 – 20 times. Your initial movements are performed at low intensities, you then gradually increase the intensity with each movement until your last few movements place the muscles that surround the moving joints under a brief stretch.
- 7) Remember your body is a product of its training environment. If your warm up routine has included static a stretching routine, your body would have adapted to this routine and therefore will feel comfortable with this routine. If you decide to change over to a dynamic stretching routine as part of your warm up routine, you may feel more comfortable initially starting off with 50% dynamic stretching and 50 % static stretching and progress to 100% dynamic stretching over a 2 – 4 week period.

STRETCHING ROUTINES

Our first stretching routine is a “general” dynamic stretching routine that I’ve designed to loosen up the trunk area, the shoulder area and the hip area. The trunk, shoulder and hip are very mobile areas, capable of a wide range of movements, involving many muscle groups including some of the largest muscles in the body.

The arms rotate forwards in a circular motion.	INSERT MOVIE
The arms rotate backwards in a circular motion.	INSERT MOVIE
Step 1) The arms are raised (palms facing upward) as they horizontally extend, with the humerus rotating clock wise (external rotation) Step 2) The arms are lowered (palms facing upward) as they again horizontally extend, with the humerus rotating anti clockwise (internal rotation)	INSERT MOVIE
The arms are raised vertically (shoulder Flexion) then lowered vertically moving pass the trunk (shoulder hyper extension)	INSERT MOVIE
The arms are raised vertically from the side (shoulder abduction) then lowered vertically from the side (shoulder adduction)	INSERT MOVIE
The trunk rotates from side to side while the upper body relaxes (trunk rotation)	INSERT MOVIE
The leg is raised vertically (hip Flexion) then lowered vertically pass the supporting leg (hip hyper extension)	INSERT MOVIE
The leg is raised vertically to the side (hip abduction) then lowered vertically to the side pass the supporting leg (hip adduction)	INSERT MOVIE
The leg rotates forwards in a circular motion.	INSERT MOVIE
The leg rotates backwards in a circular motion.	INSERT MOVIE

After completing this routine, strikers should feel little resistance in the shoulders and hips when punching and kicking as this routine is designed to take the shoulders and hips through all the movements that they are capable of. Most of the hip movements in kicking are identical to the hip movements performed in this routine, making this routine very effective for strikers that use kicks.









After completing this routine, strikers can also incorporate some sport specific striking if they feel they need to, starting off with some low intensity kicking and or punching then progressing to higher intensity kicking and or punching where the muscles surrounding the moving joints are placed under a brief stretch to further loosen the moving joints.



















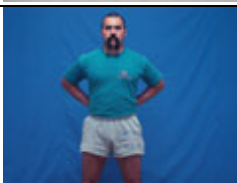

This “general” dynamic stretching routine is also well suited to grapplers. It loosens all the muscles and joints that grapplers need to move freely in defense where the grappler is under their opponent, with limited space to move, while attempting to submit their opponent or reverse the situation.

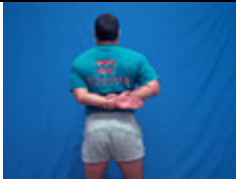





I’ve also included another 2 “sport specific” dynamic stretches for grapplers.

- 1) “Sport specific” dynamic stretch 1 is designed to loosen the muscles around the trunk when bridging (taking the spine through hyperextension and rotation).
- 2) “Sport specific” dynamic stretch 2 is designed to loosen the muscles that surround the spine when being stacked (taking the thoracic area of the spine through flexion).

Our second stretching routine is a static stretching routine designed to target all the major joints and most minor joints in the body.

<p>Bend knees, grab both feet and straighten both legs. If you can straighten both legs then pull your heels up off the ground. (Calf)</p>		
<p>Keeping left leg straight, bring your chest to your thigh, then repeat on the opposite side of your body. (Hamstrings & erector spinae)</p>		
<p>Bringing the soles of your feet together, place your elbows on your thighs and push your knees to the ground (Groin)</p>		
<p>Placing your left hand on your right knee and your right hand on the ground behind your right hip, lever off of your right knee and rotate clockwise, then repeat on the opposite side of your body. (Erector spinae & obliques)</p>		

<p>Place your left ankle over your right knee and pull your right knee to the ground while looking to the right, then repeat on the opposite side of your body. (Hips, buttocks & obliques)</p>		
<p>Interlocking your hands behind your knees, straighten your legs and round your upper back. (upper back & rhomboids)</p>		
<p>Lying flat on the ground, place both hands on the ground in line with your shoulders, then straighten your arms as you arch your back. (Abdominals)</p>		
<p>Opening you legs as wide as you can, place your elbow on the ground inside your knee and bring your head to the knee then repeat on the opposite side of your body. (Latissimus dorsi, teres major, quadratus lumborum & intercostals)</p>		
<p>Opening your legs as wide as you can, lean forwards, bringing your chest to the ground. (Groin, hamstrings & erector spinae)</p>		
<p>Standing on your left leg, grab your right foot and bring it to your butt while leaning forwards, then repeat on the opposite side of your body. (Quadriceps & hip flexors)</p>		
<p>Placing your left ankle over your right knee, grab your right shin with both hands and pull your knee to your chest, then repeat on the opposite side of your body. (Buttocks)</p>		
<p>Pointing your fingers in the same direction as your legs, walk your but forwards, bend your elbows and lean back. (Front deltoid & biceps tendon)</p>		
<p>Lying face down on the ground, place your right arm on the ground 90 degrees to your trunk with your palm facing downwards and rotate your upper body, then repeat on the opposite side of your body. (Pectorals)</p>		
<p>Place the back of your hands against your kidneys, then bring your elbows forwards. (Infra spinatus & teres minor)</p>		

<p>Grab your left wrist with your right hand and pull your left arm through, tilting your head to the right, then repeat on the opposite side of your body. (Middle deltoid & supra spinatus)</p>		
<p>Place your left hand on your right shoulder, place your right hand on your left elbow and push your left elbow to your chin, then repeat on the opposite side of your body. (Rear deltoid, latissimus dorsi & teres major)</p>		
<p>Grab your left elbow with your right hand, lean to your right and pull your left elbow behind your head, then repeat on the opposite side of your body. (Triceps, latissimus dorsi, teres major, quadratus lumborum & intercostals)</p>		

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Some of these stretches can be harmful if you perform them incorrectly or if you have current or previous injuries. I recommend that you learn these stretches under the guidance of a qualified trainer or coach and for current and or previous injuries under the guidance of a physiotherapist

CONCLUSION

Stretching is a very important training component for all martial artists. Understanding of the different types of stretching as well as how and when to implement the appropriate forms of stretching into your training will help you put together effective stretching routines specific to your needs. Currently there is a lot of research currently going on the effect of static stretching and how it effects strength and power. If you aren't a competitive martial artist, then how you perform your warm up and stretching routine probably isn't that important. If you are a competitive martial artist and strength and or power are important components in your competition, then you may have to look at how you perform your warm up and stretching routine.

Further information

Further reading on static stretching and how it effects strength and power.

- 1) Should static stretching be used during a warm up for strength and power activities. By W.B.Young & D.G.Behm. Strength and Conditioning journal Issue 6 number 24, 2002.
- 2) Factors effecting force loss with prolonged stretching. By D.G.Behm, D.C. Button & J.C. Butt. Canadian Applied Journal of Physiology. Issue 3 number 15, 2001
- 3) Acute muscle stretching inhibits maximal strength performance. By J. Kokkonen, A.G. Nelson & A. Cornwell. Res.Q. Exercise and Sport. Issue 4, number 69, 1998

