

A Guide to Stretching and Flexibility

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Why stretch?

Many claims have been made for the need for athletes to stretch. These include performance improvement, strength gains, the prevention of injury, and the reduction of post-exercise muscle soreness. However, actual scientific research to support these claims is thin. In some cases this is due to the paucity of research; in others due to the impossibility of carrying out such research. How, for instance, do you scientifically research whether someone would have been injured had they not stretched?

What can be said in relation to rowing is that without appropriate levels of flexibility in certain areas one cannot row with good technique.

The most obvious example of this is the ability to achieve a good stretch position off backstops, to rotate the pelvis around the hips towards the stern, allowing the catch to be taken with a strong core, rather than putting the strain on the lower back because the stretch has come from leaning the rib-cage forward by bending at the waist.



The specific nature of flexibility:

The crucial thing to understand about flexibility is that it is not a universal quality. Instead, flexibility is **JOINT** and **MOVEMENT** specific. Just because you have flexible shoulders does not mean that you will also have flexible ankles, for instance. Moreover, if your right shoulder is very flexible it does not automatically follow that your left shoulder will be also. Equally, just because you can do the front splits does not mean that you can also do the side splits. Therefore you need to train each joint, and in each movement pattern.

But bear in mind that each sport has differing flexibility requirements, both in relation to the joints in question and the degree of flexibility in each. So flexibility requirements are **SPORT** specific as well. Some sports, such as gymnastics, require a high degree of flexibility in every joint. However, something like rugby requires more joint stability, and therefore less flexibility. Thus one can only speak of good or bad flexibility with reference to a specific sport, and within that sport, to specific joints in specific movements.



Equally, as an implication of this, it is important to realise that more is not always better. Certainly poor flexibility in the wrong areas can easily lead to injury, as well as hamper performance. But it is also possible to be over-flexible, at which point the joint becomes unstable, a situation which can also lead to injury. As has been said, some sports require good joint stability, and this can be undermined by excessive flexibility. So having identified what **FORM** of flexibility is required for a certain sport, the **DEGREE** of flexibility must also be determined.

In seeking for this sport specific flexibility one must be aware of other ways in which flexibility is specific. It is **INDIVIDUALLY** specific, in that younger people are more flexible than older, women are more flexible than men, and a person's flexibility will be dependent on their bone structure; the internal resistance within their joints; the elasticity of their muscles,

tendons, ligaments and skin; the amount of muscle, fat deposits and scar tissue around their joints; and so forth. Moreover, flexibility is **CONTEXT** specific, relating to such things as what activity has just occurred and the ambient temperature, and the bearing these have on the warmth of the body tissue, and the time of day, given that most people are more flexible in the early afternoon. Clearly an individual has control to varying degrees over only some of these factors, therefore he or she must take account of these, either as limitations to accept or variables to control, when seeking to improve flexibility.

How to stretch:

Methods of stretching

Stretching can be achieved by a variety of methods. All methods can be categorised according to the following three aspects:

- i) Static or dynamic: the stretch can be applied to the muscle by either holding the stretch (static) or by moving quickly into and out of the stretch (dynamic).
- ii) Self- or externally-controlled: the stretch can be applied by the athlete themselves - either actively, or passively with the assistance of another part of the body or body weight, and a wall or the floor - or by an external element, such as a partner or a machine.
- iii) Active or passive: this is based on the distinction between active and passive flexibility, between the range of motion a joint can get itself into without any external assistance and that into which it can be placed, the latter being greater. Active flexibility depends on the strength of the muscles around the joint, as well as the passive flexibility. Therefore in active stretching the stretch is applied using muscular action alone with no external assistance (e.g. yoga positions), whereas passive stretching involves some sort of assistance, either from the athlete themselves, or from a partner or piece of equipment.



Of the many methods, there is little research evidence to suggest that one is any more effective than the rest at increasing flexibility. Of greater importance is that the muscles are warmed before stretching, and that the stretches are held for at least 15 seconds.

Static self-controlled passive stretching

The most appropriate method for rowers is **static self-controlled passive stretching** (often just called 'static stretching'). This is generally low risk, simple to perform and can be done anywhere. Dynamic stretching can be painful and cause soft tissue damage, and stretching with a partner is risky because they, especially if inexperienced, can overdo the stretch. (Note that this discussion of stretching methods refers to stretching to improve flexibility rather than stretching involved in warming up. Warm-up stretching aims to take muscles to their current full range of movement, whereas flexibility training stretching takes muscles beyond that to lengthen them. Methods which are inappropriate for the latter are not necessarily so for the former. There is, for instance, a difference between ballistic stretching and a dynamic warm-up.)



Stretching

- a) First off, **identify which stretches you need to perform**. Remember flexibility is individual and joint specific, so you need to work out where your inflexibility lies.

- b) Before stretching, make sure you **warm up properly**, since flexibility work is most effective when performed on a warm muscle. This involves aerobic work until your heart and breathing rates and body temperature are all elevated. While you are doing this make sure that all your joints are flexed through their full range of motion to lubricate them.
- c) **Make sure you are stable.** It is better to perform stretches sitting or lying down rather than kneeling or standing. If you need to stand, make sure you adopt a wide stance or brace yourself against something.
- d) **Breathe regularly and slowly** while stretching to relax. Do not hold your breath.
- e) **Maintain good core posture** throughout your stretching.
- f) Try to **isolate one muscle (group) at a time.** Stretch one arm or leg at a time, rather than both together.
- g) **Consider the leverage of each stretch** when deciding which position to adopt. Leverage is the degree to which body weight influences the stretch. For example, you can stretch the hamstrings by standing up and bending forward, in which case the weight of the torso is fully applied to the stretch. You can also stretch the



hamstrings by sitting down and leaning forward slightly, which applies a small amount of the torso weight to the stretch. Greater leverage can make the stretch more effective, but it also needs to be supported by your core muscles. So the degree of leverage you choose to apply depends on your stretching experience and strength levels. If you have sufficient core strength, then you can probably tolerate greater leverage on your lower back.

- h) **Move slowly using a small amount of force** to effect the stretch, stopping when mild tension can be felt in the middle of the muscle. Do not achieve the reach through momentum. Muscles have a Stretch Reflex which kicks in to oppose a

sudden or excessive lengthening of the muscle, the force of which is proportional to the speed of the initial contraction. You should certainly not experience any pain in the area you are stretching. Equally, if you cannot feel a stretch at all, it might well be that you are flexible enough in that joint.

- i) **Hold the stretch for 15-30 seconds**, rather than bouncing. After 10 seconds or so an initial stretch will have occurred, so go into the stretch a little bit further and hold for another 5-20 seconds.
- j) **Release the stretch slowly.**
- k) **The stretch can be repeated up to three times for each muscle group.** You should have a 15-30 second rest in between stretches on the same muscle group. This can be spent stretching another muscle group, such as the opposite leg or arm, to use time most effectively.

PNF stretching

If experienced, you could try an advanced technique called Proprioceptive Neuromuscular Facilitation (PNF), but, again I should stress, only once you are experienced at static stretching. This is a step on from static stretching, in that it takes advantage of reflexes in the muscle to allow further stretching. The first of these is the Autogenic Reflex, by which contracting a muscle which is being stretched causes it to relax to prevent injury. Thus after statically stretching a muscle for 10-20 seconds, the muscle can be tensed



for another 5-10 seconds against an immobile object so as not to produce movement, then briefly relaxed for 2-3 seconds and stretched slightly further for another 10-20 seconds.

One could stop at this point, or take a second step, which takes advantage of the Reciprocal Inhibition, by which when one muscle group contracts, its opposite relaxes. In this case, after the second static stretch, you can tense the antagonist of the muscle you are stretching for another 5-10 seconds, before holding a further static stretch for another 10-20 seconds. For instance, when stretching your calf, you can assist the stretch by tensing the shin muscles.

As the PNF technique is quite an aggressive form of stretching you should rest for at least 20 seconds after a PNF stretch before undertaking another one, if indeed you perform another stretch at all. Some researchers argue that multiple stretches are no more effective than just one. However many stretches you perform, you should only use this technique on a muscle group once every 36 hours.

PNF stretching is often done with a partner to help stabilise the limb as the muscle is contracted, and then to increase the subsequent static stretch. However, not only does this increase training time as the partner is not stretching while helping, but it is also the case that unless the partner is very experienced, they can do more harm than good by over-doing the stretch. You should not use the partner method because of these risks.

Moreover, because PNF stretching is so strenuous it comes with an increased risk of injury as opposed to static stretching. Do not attempt this method unless you are very experienced at stretching, and have exceptionally poor flexibility. Unless you need to use it and really know what you are doing, the potential gains are not worth the risks.

PNF stretching offers the possibility of greater improvement in flexibility than normal static stretching. However, it also comes with risks, so do not attempt it unless you are very experienced with the static stretching method, and you have very poor flexibility. Do not use PNF with a partner.

Sequence of stretching

Various theories have been proposed as to the order in which stretches should be done. The simplest order would be to work from the head down to the feet, stretching the joints you need to do on the way. The advantage of this is that it is less likely that a joint will be left out.

A slightly more complex order is based on the principle that some stretches actually cover a number of muscle groups, while others target specific muscles. Accordingly, you should aim to perform the specific stretches first, then the general ones. Thus the order you do your stretches in should take account of the following:

- Stretch your back first;
- Stretch your sides after stretching your back;
- Stretch your buttocks before stretching your groin or hamstrings;
- Stretch your calves before stretching your hamstrings;
- Stretch your shins before stretching your quads; and
- Stretch your arms before stretching your chest.



That said, it is more important that stretching takes place in some order than that you don't do it because you are confused about what exactly the right order is. Find an order that suits you and run through it regularly.

When to stretch

Flexibility training should be done on **a regular basis 3-5 times per week**, remembering that it takes months to give results. Note that this means that most of the sessions will not be done at school. It is up to you to take responsibility for your flexibility training. Be inventive in this; you do not have to do a complete session covering every joint every time. Instead you could take as little as five minutes to stretch just a handful of joints if five minutes is all you have.

Stretching for flexibility should take place **when your muscles are warm**, so either after aerobic sessions, or as a stand-alone session, but after a thorough warm-up. Warm muscles are more easily stretched, and the effects of stretching last longer. Do not stretch before a training session, since this can actually reduce strength and increase the likelihood of injury. (Bear in mind again that this refers to stretching to develop flexibility. Stretching is appropriate in warm-ups and warm-downs, though not in relation to increasing flexibility.)

The aim of stretching:

The stretch over off the finish (note in particular the posture of the lower back):



The catch position:



Again:



Compare the posture of the GB double at the bottom with the rest of the field:



Specific stretches:

In selecting which stretches to perform, think about which joints YOU need to stretch. It may not be that you need to stretch every joint; it may be that some need special attention. Rowers tend to need to focus on their hips, ankle and shoulders, so stretching hamstrings, calves and muscles around the shoulder will be important.

It is also advisable to use a variety of stretches for the same joint. Different stretches on the same joint are not necessarily alternatives. Often they stretch different fibres, or different muscles within a muscle group. So use a variety of stretches, and change them regularly.

This variety also covers stretches which can be done inside, using walls and doorways, and lying or sitting down, and different versions of the same stretches which can be done standing up, perhaps next to your boat in a field waiting to boat for a Head race.

Finally, it should be stressed that this list is by no means exhaustive. There may well be many other ways of stretching the joints covered below. If you find another method which you like, then use it instead.

Forearms:

Kneeling:

Kneel on the floor. To stretch the underside of your forearm, place the palms of your hands on the floor with your fingers pointing back towards your knees. Shift your body back while keeping your elbows straight. Hold the stretch.

To stretch the top of your forearm turn your hands over so the backs are against the floor.

This stretch can also be performed leaning against a wall. Place your hands against the wall and slide them in the opposite direction to which the fingers are pointing to apply the stretch.



Standing:

To stretch the underside of your forearm, put your palms together in front of your body, with your fingers pointing back towards your neck. Pushing your hands together, lower them away from your body until your wrists separate. Hold the stretch.

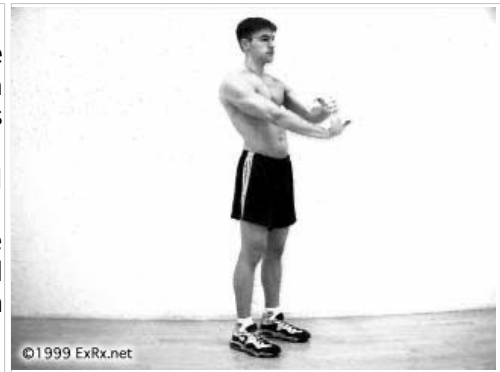


Standing:

To stretch the underside of your forearm, put one arm out in front of you and bend your hand up. With the other arm, pull the fingers back. Hold this stretch, then repeat with the other arm.

To stretch the top of your forearm bend the hand down, rather than up.

This stretch can also be done against a wall. Place the hand of the arm being stretched against the wall and slide the hand in the opposite direction to which the fingers are pointing to apply the stretch.

**Biceps:****Standing:**

Brace one arm against a wall, door-frame or something similar, with your arm horizontal and the back of your hand facing up and palm down. Gradually turn your body away until you feel a stretch. Hold this position, then switch arms.

If you don't have a wall, just hold both arms out to the side horizontally with your palms down to the ground, and draw them back as far as you can.

**Triceps:****Standing:**

Put one arm over and behind your head, bending it at the elbow. Grasp the elbow of this arm over the top of your head with the other hand and gently pull the elbow back and down. Hold this stretch, then repeat with the other arm.

**Neck:****Standing/Sitting:**

Keep your head up and turn to one side.



Standing/Sitting:

Tilt your head forward so that your chin touches your chest.

**Shoulders:****Standing (front of shoulder):**

Brace one arm against a wall, door-frame or something similar, with palm towards the wall slightly lower than your shoulder and elbow slightly bent. Gradually turn your body away until you feel a stretch. You can target the area of the stretch: raising the elbow slightly lowers the area of the chest being stretched, and vice versa. Hold this position, then switch arms.

**Standing (side of shoulder):**

Put one arm across your chest, holding it at the elbow with the other arm. Gradually pull the arm across your chest to increase the stretch. Hold this position, then switch arms.

**Standing (back of shoulder):**

Put one arm across your neck, holding it at the elbow with the other arm. Gradually pull the arm across your neck to increase the stretch. Hold this position, then switch arms.

**Sitting (front of shoulder):**

Sit on the floor and lean back, placing your arms behind you with your hands just more than a shoulder's width apart and fingers pointed away from you. Either slide the hands back or your backside towards your feet to apply the stretch.

This stretch can also be performed standing up against a wall.

An alternative would be to simply interlock your fingers behind your back, and then, keeping your



arms straight, raise your hands.

Chest:

Standing:

Bend one arm to a right-angle and place the palm and forearm of this arm against a wall, door-frame or something similar, with the elbow slightly lower than your shoulder. Gradually turn your body away until you feel a stretch. You can target the area of the stretch: raising the elbow slightly lowers the area of the chest being stretched, and vice versa. Hold this position, then switch arms.



Back:

Lying:

Lie on the floor and lift your knees up to your chest, then pull your knees towards your shoulders so that your hips come off the floor. Also raising your shoulders will add a stretch to that part of your back.



Kneeling:

Kneel on all fours on the floor with hands shoulder width apart. Arch out your back and hold.



Kneeling:

Kneel on all fours with your back flat, your hands under your shoulders and your knees under your hips. Move your backside to your heels. Hold this stretch. Then slide your hands forward to stretch your upper back. Hold this stretch. You can further stretch your lats by putting your right hand to the right, placing your left hand on top of it, palm facing up. Hold the stretch, then change hands.



Standing/Sitting:

Put one arm behind your back and grips its wrist with the other hand. Tip your head away from the stretched shoulder and pull the shoulder down.

**Standing/Sitting:**

Cross your arms so that your hands are on or behind the opposite shoulder. Pulling your elbows back round applies the stretch. You can lean forward and to the sides to vary the stretch area as required.

An alternative to this is to stretch your arms out in front and link fingers with palms facing away. Bend your knees, tilt your pelvis backwards and look down, while reaching forward with your arms.

**Laterals:****Standing/Kneeling:**

Stand with a relatively wide stance with feet level. Raise one arm, and lean to the opposite side, stretching the raised arm over you head and towards the opposite side. You can increase the stretch by gripping the elbow of the overhead arm with the opposite hand. Hold this stretch, then switch arms. This stretch can also be done kneeling down.

**Abdominals:****Kneeling/Standing:**

Kneel on the floor. Bracing yourself with your hands on the back of your hips, lean back, arching your lower spine, and hold.

This stretch can also be done standing up.



Lying:

Lie face down on the floor with your hands forward in a press up position. Push with your arms to arch your back, keeping your pelvis on the floor. Walking your hands back towards your hips will increase the stretch.

**Obliques:****Sitting:**

Sit on the floor with your legs flat. Bend on knee and put the foot of that leg outside the knee of the other leg. Turn the body in the direction of the bent leg, supporting yourself with the arm on the same side. Place the elbow of the other arm outside the knee of the bent leg to facilitate the stretch. Hold this position and repeat with the other side. (You can also stretch your hip abductors of the bent leg in this position by pulling the bent knee across and over the straight knee.)

**Lying on your back:**

Lie on the floor with arms out to your sides, so you form a cross. Lift one leg straight into the air so that it is at right-angles to the floor and then lower it across the other leg, keeping both shoulders flat on the floor. Hold this stretch and then switch sides. You can bend the knee of the leg performing the stretch, and use the opposite arm to pull the knee across to increase the stretch.

**Gluteus Maximus:****Lying on your back:**

Lying on your back, bend both knees to right-angles keeping your feet on the floor. Cross one leg over the other, so that its ankle rests on the thigh of the other. Hold the thigh of the lower leg and gradually pull it towards you. Hold this position, then switch to the other leg.



Lying on your back (alternative method):

If you cannot reach the lower leg, then hold the top leg behind the knee and gradually pull it towards you across the body towards the opposite shoulder, keeping your other leg straight and flat on the floor. Hold this position, then switch to the other leg.



Groin:

Sitting:

Sit on the floor with the soles of your feet together. Holding your feet with both hands and placing your elbows on the inside of your lower legs, gradually bring your heels into your groin, and press your knees outwards towards the floor. Sit tall throughout the stretch to keep your pelvis from tilting backwards.



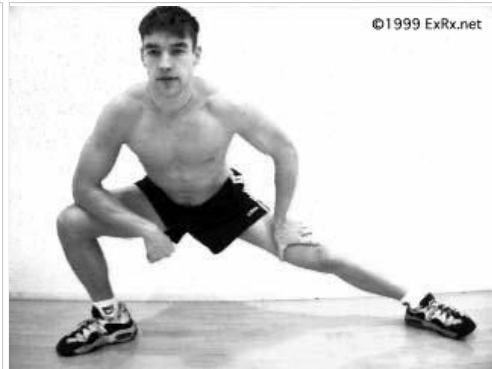
Lying:

Lie with your backside against a wall with your legs also against the wall in the air. Gradually let the legs part, maintaining contact with the wall, applying the stretch.



Standing:

Stand with feet wide apart and feet turned 45 degrees out. Lunge slowly to one side and feel the stretch on the inside of the straight leg. Leaning back towards the straight leg should increase the stretch. Hold this position, then repeat with the opposite leg.



Hamstrings:

Lying on your back:

Two methods:

i) Lie on your back and lift one knee up with the leg bent, so that the thigh is vertical. Grasp behind your thigh near your knee with both hands. Keeping the thigh still, gradually straighten the leg until you feel a stretch in the hamstring. Hold this position, then repeat with the opposite leg.

ii) The alternative method involves having your leg almost straight to start with. Holding your leg with both hands just below the knee, gradually pull the whole leg towards your head until you feel a stretch in the hamstring. Hold this position, then repeat with the opposite leg.



Standing with a bench:

Place your foot on a bench or something similar. (Do not try to stretch on something which is too high, or raise your foot too quickly.) Pivoting at your hips not waist, reach forward maintaining good lower back posture, until you feel a stretch in the hamstring. (Note this means you do not have to touch your toes: keep both your forward leg and spine straight.) Hold this position, then repeat with the opposite leg.



Standing:

Stand with one foot forward and the rear foot pointing out. Bend forward, leaning with one hand on the knee of the rear leg. Keeping the spine and the front leg straight, lean forward and bend the rear knee in the direction of the rear foot. Hold this position, then repeat with the opposite leg.



Sitting:

Sit on the floor with one leg out straight. The other leg should be bent and laid out to the side, so that the sole of the bent leg is against the knee of the straight leg. Keeping the spine straight, lean forward and grip the toe of the straight leg, tipping the pelvis forward to apply the stretch. If you cannot reach the toes, you can hook something, such as a towel, around your foot and hold onto that. Hold this position, then change legs.

**Sitting on a bench:**

Sit on a bench or something similar with one leg bent and the other straight. Keeping your spine straight, lean your body forward at the hips. You can control the stretch more by supporting your body weight with your hands on the bent leg. Hold this position, then repeat with the opposite leg. If you do not have a bench you can always do this stretch kneeling down on one knee.

**Hip Flexors:****Kneeling:**

Lunge forward with your back knee on the floor and your front foot a long way forward of it. Lean on your front knee, but keep your body upright. Push your front knee and hips forward and down to apply/increase the stretch. Hold this position, then switch legs.

**Standing:**

Lunge forward, taking a large step (the step needs to be large enough so that when you compress into the stretch your front knee does not go too far forward of the front foot) and keeping the body upright. Push your hips forward and down, keeping your front foot on the floor, and your rear foot pointing forward. Hold this position, then switch legs.

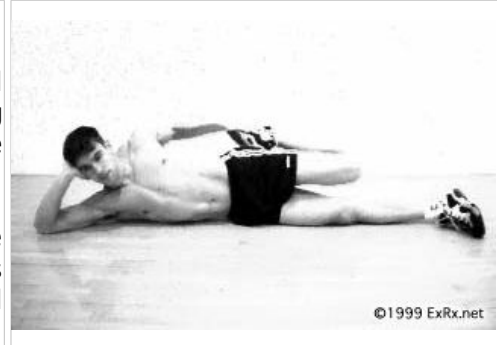
**Quadriceps:**

Standing:

Standing on one leg, using something to help you balance if you need it, bend the other leg up behind you and hold the ankle. The knee must be totally flexed and the bent leg kept parallel to the standing leg. Pulling the foot higher, moving the knee backwards and/or pushing the hip forward will increase the stretch if needed. This will also change the emphasis of the stretch: with hips in a neutral position the lower part of the quads will be stretched, whereas the upper part is targeted when the hips are pushed forward. Hold this position, then switch legs.

**Lying:**

Lie on one side, bend the top leg up behind you and hold the ankle. The knee must be totally flexed and the bent leg kept parallel to the bottom leg. Pulling the foot closer to your backside and/or moving the knee backwards will increase the stretch if needed. This will also change the emphasis of the stretch: with hips in a neutral position the lower part of the quads will be stretched, whereas the upper part is targeted when the hips are pushed forward. Hold this position, then switch legs.

**Calves (Gastrocnemius):****Standing on a step:**

Stand on a step with the balls of your feet just on the edge. Using the wall for support, keep the knee of the leg you are stretching straight and allow your body weight to apply the stretch. Hold this position, then switch legs.

**Standing against a wall:**

Leaning forward against a wall, have one foot forward and the other back. Keeping the back knee straight and both feet flat on the floor, bend the front knee. To increase the stretch, push your hips further towards the wall. Hold this position, then switch legs.

Instead of leaning against a wall, it is possible to do this stretch leaning forward with your hands on the floor.



Standing:

Stand with one foot a short step in front of the other, both feet pointing forward. Keeping the back knee straight, both feet flat on the floor and your body upright, bend the front knee. Hold this position, then switch legs.



Lower Calves (Soleus):

Standing on a step:

Stand on a step with the balls of your feet just on the edge. Using the wall for support, bend the knee of the leg you're stretching. Hold this position, then switch legs.



Standing against a wall:

Leaning forward against a wall, have one foot forward and the other back. Keeping both feet flat on the floor, bend both knees. Hold this position, then switch legs.

Instead of leaning against a wall, it is possible to do this stretch leaning forward with your hands on the floor.



Standing:

Stand with one foot a short step in front of the other, both feet pointing forward. Keeping both feet flat on the floor and your body upright, bend both knees. Hold this position, then switch legs.

**Shins (Tibialis anterior):****Kneeling:**

Kneel with both feet close together and your feet in a straight line relative to your legs. Lower your body weight to apply the stretch.

**Standing:**

Standing on one leg, using something to help you balance if you need it, bend the other leg up behind you and hold the toes, pulling the foot up. Hold this position, then switch legs.

**Websites:**

A very good website can be found at <http://www.exrx.net/Lists/WtMale.html>. Click on the area of the body you want to stretch and you will be taken to a list of stretches on the right-hand side of the screen.

PS Not what is meant by flexibility in rowing:

Abingdon School's J16 4- at National Schools Regatta 2007:



Cambridge show us how it's done in 1984:

