

Lumbar and Sacroiliac Joint Stability and Mobility Programme

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Introduction

This programme is designed to assist people who suffer from lower back pain, and in particular that caused by misalignment of the sacrum on the ilium and the lumbar vertebrae on the sacrum, after and between osteopathic treatment. The idea behind the programme is that the joints referred to come out of alignment at least in part due to imbalance in the length, strength and tone of the muscles that attach to them.

There are many possible factors in joint misalignment that cannot be addressed by this programme alone – such as bone and joint anatomy, ligament damage, vertebral disc problems, inflammation, severe accidents, and disease. Further, this programme is not meant to be a substitute for proper medical attention.

However, back pain is often caused or exacerbated by muscle tension acting directly on the joints and/or nerves, and also by imbalance in muscle action affecting (and being affected by) posture, gait and the movement of the lower back and hips in everyday activities from housework to sports - all of which may be helped by proper strengthening, stretching and mobilisation exercises.

Many muscles attach either directly to the sacrum or to tissues that do so. All of these have some effect on the position and movement of the sacroiliac and sacrolumbar joints. In the majority of people with low back pain, some of these muscles are tighter than they should be and need to be stretched, while other are weak and need to be developed. People should be evaluated individually, but typically, the two muscle groups are:

Muscles to stretch:

Piriformis
Rectus Femoris
Lumbar Erectors
Psoas
Thigh Adductors
Hamstrings
Tensor Facia Latae
Quadratus Lumborum

Muscles to develop

Transverse Abdominals
Multifidus
Vastus Medialis
Vastus Lateralis
Gluteals
Quadratus Lumborum

The sacroiliac joint and the sacrolumbar joints are very different; a programme that purports to deal both must recognise these differences, even where it is, as in this case, meant to provide improved balance and stability for both. This programme is meant to be used in conjunction with your therapy treatments. Even though the exercises are gently and very unlikely to cause any discomfort, some of the exercises may not be suitable for you; your therapist will indicate a specific programme for you.

Advice on achieving and maintaining good posture and the use of the body for bending and lifting is also a part of a 'help you back' programme. Your therapist can help you find appropriate information and can provide training in these, too.

Organisation of the programme

The programme is organised into four sections.

The first sets out a small set of gentle sacroiliac mobilisation exercises that will create small movements in the joint, helping it to adjust to its natural position.

In the second section, the basic tests and exercises for core stability are given. The joints involved need to move easily (flexibility) supported by sufficiently strong muscles (stability) – the right muscles.

The third section provides mobilisation exercises (stretches) to improve flexibility in the joints involved in lower back pain. These stretches are also to be used after strengthening exercises; strengthen glutes – stretch glutes.

Finally, in the fourth section, we provide tests for weakness and/or shortness in specific muscles that might be involved in low back pain, in order to pinpoint specific muscles for treatment.

1. Sacroiliac mobilisation exercises

Hamstring stretch

- Sit on the floor, with your legs outstretched.
- Bend forward as far as comfortable. Grasp your legs.
- Sit up against resistance from held position for 10 seconds.
- Relax and bend further forward. Hold for 30 seconds.
- Repeat.

Quadricep stretch

- Stand an arm's length away from a wall, facing straight ahead.
- Brace yourself by placing one hand against the wall.
- With your other hand, grasp your (opposite) ankle and pull your heel towards your buttocks. Keep your knees together, do not arch or twist your back. Push gently forward with your hip.
- Hold for 30 seconds, and repeat three times for each leg.

Hip abductor stretch

- Sit on the floor, with feet together (soles touching) and knees as far apart as possible
- Rest your hands on the inner aspect of your knees and push thighs outward as comfortably as possible.
- Press in with your knees while pressing out with your hands, so that there is no motion – use no more than ¼ of your strength – holding for 7 seconds. It may be more comfortable to cross your arms for this.
- After the contraction, release pressure inward, and your legs may be able to travel further apart. Hold for 30 seconds.
- Repeat the sequence once more.

Adductor isometrics

- Sit with your knees bent at 90° with a pillow placed between your knees and your feet flat on the floor.
- Squeeze the pillow for 5 seconds and then relax. Do 3 sets of 10.

Prone buttocks squeeze

- Lie flat on your stomach with your arms at your sides.
- Slowly tighten your buttocks muscles and hold the position (not your breath) for 5 to 10 seconds. Relax slowly.
- You may need to place a small pillow under your stomach for comfort.
- Do 3 sets of 10.

Lower trunk rotation

- Lie on your back with your knees bent and your feet flat on the floor.
- Tighten your lower abdominals and push your lower back into the floor.
- Keeping your shoulders down flat, gently rotate your legs to one side, then the other – as far as your can. Repeat 10 – 20 times.

Knee to chest stretch

- Lie on your back with your legs straight in front of you.
- Bring one knee up to your chest and grasp the back of your thigh.
- Pull your knee toward your chest, stretching your buttock muscle. Hold for 30 seconds.
- Repeat three times on each side.

Double knee to chest stretch

- Lie on back, without a cushion. Knees apart, bend knees and hips.
- Place a hand on each knee and (painlessly) pull knees towards your shoulders (not chest) as far as possible. Breathe in and hold breath as long as comfortable.
- On exhalation draw knees closer to shoulders; hold for 30 seconds.
- Repeat twice more.

2. Core Stability

Core stability means maintaining good alignment between the hips and the spine while various demands are put on the body which otherwise would cause dangerous bending and twisting leading to, for example, permanent tissue damage.

Sitting and slouching are the bane of the core stabilising system. Office work, restaurants and sitting-room sofas have a lot to answer for.

The programme for developing strength in the correct stabiliser muscles consists of first learning what is correct alignment and how to recognise it and then slowly developing muscle strength to the point where the muscles do their proper job. The muscles in question are: internal obliques and transverse abdominus, gluteus maximum and medius, quadratus lumborum,, multifidus, psoas

The human body can be thought of a two big, heavy parts, attached by a small, thin flexible rod. We're not quite like a wasp, but if you strip away the soft bits, you will see that our lower spine is the junction between the head, arms and ribcage above and the pelvis and legs below. The bottom of the spine is the sacrum, which is 5 vertebrae fused together. The sacrum is attached to the pelvis by many ligaments (the sacroiliac joint), allowing only a small amount of movement. This movement may be exaggerated either by accident, by serious misuse, or by softening of the ligaments in preparation for childbirth.

The upper part of the body moves on the lower body by twisting and flexing of the spine, particularly the joints of the lumbar spine, and the sacrolumbar joint. These joints are prevented by moving too far (or at all) when we bend and unbend to sit and stand, to lift objects or to reach out, by many ligament connections, and by many muscles, some of whose job is primarily to provide stability, and others whose primary job is to cause movement. An abundance of connecting tissue links the muscles that attach to the lumbar spine, the sacrum and the pelvis, and this, too provides some of the stability needed to enable us to perform our normal every-day tasks.

As the introductory paragraphs to this section show, there are many ways in which this stability can be achieved – through muscles, ligaments and connective tissue. There is, however, a 'right' and a 'wrong' way for the body to work. The wrong way leads to discomfort and pain. Many factors may lead to the body being used the wrong way (stability being achieved, if it is, by the 'wrong' mechanism). Serious injury or disease may cause problems that can be corrected only by significant medical or physical therapeutic intervention, if at all. However in many cases, it is simply modern lifestyles that are the cause, and exercise, together with therapies such as osteopathy and massage can help.

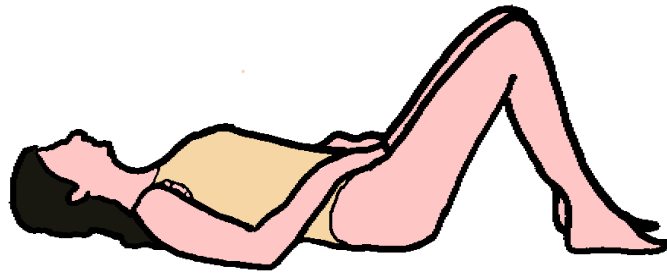
Here we give a few simple tests to help you determine if your core stability system is operating 'correctly,' and exercises to correct any 'faults.' We do not go into great depth here, but further information is available on request. The exercises of basic Pilates are excellent, and, if you are so inclined, we recommend that you find a good instructor and engage on a short exercise programme with them.

There are four muscles that contribute most to core stability. The two muscles most commonly addressed in discussing core stability are the first two in the 'to be developed' list above – the Transverse abdominals and the Multifidus. The latter provides stiffness in the lower spine, running up and down and connecting to the various vertebrae. The former is the innermost abdominal muscle layer and wraps around the lower abdomen, providing both movement and support in a number of ways. In people suffering low back pain it is commonly found that these deep muscles have fallen into disuse, and that more superficial muscles have taken over their jobs. By doing the work of two sets of muscles, the superficial muscles become overworked, go into spasm, and cause pain, while sometimes still not providing the joint stability required. The other two muscles are the bottom muscle (the gluteus maximus, along with other muscles that tend to contract when it is contracted) and the psoas muscle, part of the iliopsoas muscle group that operates when you lift your knee in a seated position.

Before starting this part of the programme, it's a good idea to relax and experience your relaxed body. Here is a short relaxation exercise.

Relaxation Exercise: Start

1. Lie in the Relaxation Position (see diagram). Use a comfortable mat or carpet.
2. Support your head with a folded up towel or bath mat, about 3 cm thick.
3. Keep your feet and knees in line with your hips, or a little wider if that is more comfortable.
4. Place hands on abdomen (see diagram) Take a deep breath, hold, then release it slowly.



Relaxation Exercise: Action

- (Breathing In): Raise your shoulders toward your ears.
- (Breathing out): Lower your shoulders towards your hips.
- (Breathing normally): Let your shoulders totally relax.
- Feel your body widen and lengthen.
- Imagine sand trickling out of your back pockets.
- Imagine sand trickling out from double pockets on your shirt
- Imagine sand trickling from the middle of the back of your neck.
- Say quietly to yourself: "There is no tension from my toes.... to my tail bone... to the frown on my forehead.
- Repeat the relaxation exercise as often as you need to to get the relaxation to occur. Get to know and enjoy the feeling!

Finding Pelvic Neutral

The next step is to find Pelvic Neutral alignment

Lie down in the Relaxation Position

Before we can find "Pelvic Neutral" alignment, we need to explore the full range of pelvic tilt.

Pelvic Neutral: Action

Caution! Do not push your pelvic tilt beyond the level of mild discomfort! The first thing we are going to do is explore the full range of pelvic tilt.

- Imagine there is a clock face attached to the front of your pelvis and looking forward.
- Make your clock face "look upward" toward your head by tilting your pelvis so that 6 o'clock is higher than 12 o'clock. Hold, and take a couple of shallow breathes.
- Now make your pelvic "clock face" look downward by tilting your pelvis so that 6 o'clock is below 12 o'clock . Hold and take a couple of shallow breathes.
- Now come back to the centre of your pelvic range of movement. You should still have a small natural arch in your back (not quite enough to get your fingers under). Relax, and get the feel of pelvic neutral into your mind!

The "pelvic clock face" is now looking straight ahead. This is Pelvic Neutral!

Abdominal Bracing

This is sometimes known as Zip and Hollow by Pilates practitioners. You need first to learn to contract the deep abdominal stabilisers before you can work to increase their strength and endurance. Here is one technique.

The Zip and Hollow:- Start Position

1. Lie on your back in the relaxation position with your knees bent toward your chest.
2. Put your hands on the area of your abdomen that would be covered by the front part of a bikini. (the "bikini patch".
3. Have your thumbs touching at the navel, and your fingers touching at the midline, about 6 cm below the navel.

The Zip and Hollow:- Action

1. Now imagine that you have to zip into a very tight pair of jeans: -

2. Hollow the area under your thumbs and fingers toward your spine – draw your navel towards your spine. There may only be a very small movement. (Maintain Pelvic Neutral!)
3. Now imagine (if it hasn't already happened), that the area under your fingers is being zipped together like that tight pair of jeans! (keep the rest of your body relaxed, and maintain Pelvic Neutral!)

(If you are having trouble making the above happen, try leaving just one hand over the “bikini patch”, and sucking your thumb with the other- suck gently for stage (2), and hard for stage (3)- Sounds weird, but it does help!).

Other tips that you may find useful, are:-

- Lie on your stomach and imagine that you have discovered an ice cube under your navel, and try to draw your navel away from it.
- Imagine that you need to urinate, and tighten the muscles needed to prevent your doing so.
- For women, in particular, start by tightening your pelvic floor muscles.
- Think of tightening your deep abdominal muscles in order to stiffen your spine.
- If in doubt, ask your therapist for help.

Do not hold your breath during this exercise.

This is an isometric abdominal exercise. Use it through the day to facilitate Transversus abdominis protection of the lower back. You can also do this exercise while sitting and walking, once you have found pelvic neutral in the standing and sitting positions.

4. Specific Muscle Stretches and Development Exercises

Muscles to develop

Transverse Abdominals
Multifidus
Vastus Medialis
Vastus Lateralis
Gluteals
Quadratus Lumborum

Muscles to stretch:

Piriformis
Rectus Femoris
Lumbar Erectors
Psoas
Thigh Adductors
Hamstrings
Tensor Facia Latae
Quadratus Lumborum

Muscle Testing and Strengthening Exercises

These exercises are meant for gentle toning, to bring the muscle involved to a proper level of functionality. They are not meant for body-shaping, body building or sports fitness – nor are they designed for rehabilitation after injury or accident. Consult your therapist if any of them causes you pain or if you have any concerns about them.

Transverse Abdominals

Having mastered abdominal bracing, you can use the following exercises to develop strength and endurance of the inner abdominal muscles in a gently, progressive manner.

All the exercises are done in the zipped and hollowed (braced) position, with the pelvis in its neutral position, and you should perform each exercise daily until it is easy to do before going on to the next. Don't hold your breath.

Start all stages in the relaxation position, and throughout them there should be no movement of the pelvis or spine. If you cannot do one of the stages without moving your pelvis or spine, go back to the previous one.

1. Leg slides – slide one leg along the floor until the leg is straight. Slide it back to the relaxation position.
2. Raise both arms to about 45°, and also one foot slightly from the floor; Hold this for 5-8 seconds. Do this with each leg and repeat 5-10 times.
3. As before, but raise the foot 12 inches from the floor, holding for the same time and doing the same repetition.
4. As before, but raising both feet a few inches from the floor.
5. As before, but raising both feet 12 inches from the floor.
6. The final stage is the 'dead bug'. For this, adopt the same position, but with your arms above your head. Raise both legs and start to perform slow-cycling movements, taking the legs into flexion and extension alternatively. Add arm movements and finish with a holding position in which the legs and arms are in the air, stationary, for a minute or more, as you maintain your abdominal hollowing and continue to breathe in a slow, relaxed manner.

A good standing exercise for toning these muscles is the 'waiter's bow':

1. Stand up with good posture; knees soft, lumbar spine in neutral, head up and shoulders back and relaxed.
2. Breathe in and relax. Breathe out and as you do so perform the abdominal hollowing action.
3. Keeping the tension, slowly lean forward from the hips 20 deg and stop, like a waiter's bow, keeping your back completely straight and long as you lean.
4. Hold the lean position for 10 seconds - you will feel your TA and MF supporting you if you hold the correct position.
5. Keeping the tension and the alignment, slowly return to your start position. Repeat 10 times.

Multifidus – trunk extension

1. Lie on the floor on your stomach, with your hands interlocked behind your neck, elbows pointing forward so that they lie as close to parallel to the floor as possible.
2. Lift your chest from the floor approximately 2 inches and then lie down again.
3. Your legs and feet should remain in touch with the floor throughout. There will be a tendency for the feet and lower legs to rise and this shows excessive effort from the superficial erector spinae.
4. With a pause of no more than 2 seconds in between, do this repetitively 15 times and on the final lift hold for 30 seconds.

If you find difficulty with, do the exercise starting with your arms down behind you, hands clasped over your bottom.

Vastus Medialis and Lateralis

For this exercise, use ankle weights

1. Sit upright on a chair, with your spine in neutral and your abdomen braced, legs bent at 90°.
2. Taking at least 5 seconds for each action, straighten and the lower one leg at a time, but only about half-way to the floor. Do not lock the knees. Do not arch your back.
3. Repeat 10 times with each leg

This exercise strengthens the all the quadricep muscles (including the vastus) and promotes core stability during movement. Use your deep trunk and gluteal muscles to hold your lumbar spine in neutral and pelvis level as you perform the movement up and down. The movement should only come from the leg muscles..

1. Stand with feet hip-width apart in front of a mirror. Ensure your lumbar spine is in neutral and your back is tall with your shoulders back and head up.
2. Lunge forward and bend your knee only half way down. Ensure that your front knee is in line with your toes and your back has remained upright with your lumbar spine in neutral and your hips level.
3. Push back up, initiating the movement by pushing down into the floor with your front foot. The force from your legs should bring you back up quickly and easily to your start position. Your back should have remained totally still and your hips level as you performed the push back.

Gluteus maximus

Prone buttocks squeeze

1. Lie flat on your stomach with your arms at your sides.
2. Slowly tighten your buttocks muscles and hold the position (not your breath) for 5 to 10 seconds. Relax slowly.
3. You may need to place a small pillow under your stomach for comfort.

A seated version that you can do while watching television

1. Sit down, scoot your bottom several inches forward away from the back of your seat.
2. Lightly press your feet into the floor.
3. Squeeze your butt muscles together and hold 5 minutes and work up to 20 minutes.

Prone gluteus maximus hip extension

1. Lie face down
2. Flex knee to 90°
3. Extend hip, emphasizing the action of the gluteal muscles.
4. Hold – starting at 3-5 seconds, increasing to 30 sec.
5. If you can't do at first, have someone lift your leg and start to let go, while you try to hold, or to control drop. As your strength increases, do the exercise yourself. – start with 10 repetitions of 10 second contractions

Gluteus Medius

Exercise 1

1. Lie on your side
2. Keep the lower leg straight and the upper leg flexed to about 80° at the knee and 90° at the knee, foot resting on the floor.
3. Using your foot as a pivot, raise the knee sideways by at least 45°.
4. Hold for 10 seconds, or as long as possible if you can't hold for 10 seconds, and then lower slowly.
5. Repeat 5 times each side.

Exercise 2

1. Lie on your left side with your left hip and knee flexed to 90 degrees
2. With your right leg straight at the hip and knee, and your body straight, extend the leg upwards, being careful not to let it move out in front of you.
3. Look down your body. Your right leg should be in line with your trunk during the whole exercise.
4. You can either hold the leg in the air for a count of 5 seconds and then release and repeat, or do it as a continuous exercise.
5. Repeat 1 – 4 for your left leg.

Quadratus Lumborum

1. Lie on your side with legs straight, one on the other
2. Cross your top foot over the lower one to establish a point of support on the floor
3. Use the forearm that is resting on the floor to raise yourself sideways until your hips are off the floor and your body is in a straight line (no sagging, maintain abdominal bracing)
4. Your free arm should either lie alongside your trunk or be crossed over the chest so that the hand can rest on the opposite shoulder
5. Repeatedly raise yourself into this position and hold for 5 seconds before lowering and repeating. You're ok when you can do this ten times.
6. Repeat on other side.

Stretching Exercises

Piriformis

1. Lie face downwards
2. Your leg on the side to be treated should be bent at the knee and your lower leg allowed to fall outwards, rotating your upper leg internally.
3. When all the slack has been taken out (complete relaxation), your foot and lower leg should be moved slightly towards the upright (an inch) and held for 15 seconds before being released and allowed to fall outwards, again into rotation, for a further 30 seconds.
4. Repeat once more

Alternative Stretch

People with severe hip disease may find this stretch provokes pain in the groin - if this is the case try doing the Iliopsoas, Quadriceps and Adductor stretches first, coming back to this one later.

1. Lie on your back with both legs straight out in front of you.
2. Bend your right leg at the hip and knee, and place your right heel on your left thigh just above the left kneecap.
3. Use your left hand to grab your right knee.
4. Gently pull your right knee towards your left shoulder to find the barrier point in your right buttock (if your head is north on the compass then the direction of the pull is north east).
5. Gently move in and out of the barrier point using your left arm to control the movements for a few minutes. Feel the right buttock muscles progressively stretch.
6. Try no.1 to no.6 with your left leg (the direction of pull will be now north west).
7. To make this stretch slightly tougher, try sliding the foot over the side of the other knee, rather than resting it on top of the other knee. Eventually you may be able to get your foot flat on the floor.

MET Stretch

1. Do no.1 to no.4 with your right leg as above to find the barrier point in your right buttock.
2. Take a deep breath in and hold it. Push your right knee away from you, but stop it from moving by holding your right knee with your left hand. Hold this for FIVE seconds.
3. Breath out quickly and relax your leg muscles, but not your left arm. In the next THREE seconds use your left arm to pull your right knee closer to your left shoulder (north east) to find the new barrier point.
4. Do no.2 to no.3 again several times until your right buttock no longer feels tight.
5. Do no.1 to no.4 for your left leg.
6. To make this stretch slightly tougher, try sliding the foot over the side of the other knee, rather than resting it on top of the other knee. Eventually you may be able to get your foot flat on the floor.

Rectus Femoris

1. Stand facing a wall or heavy piece of furniture and place one hand against the wall or furniture to stabilise yourself, as you bend the opposite leg, and grasp your ankle or foot, bending at the knee as far as possible with comfort.
2. Extend the thigh of your bent leg back, until you feel a comfortable stretch in the front of your thigh. Stabilise your pelvis so that you do not bend forward at the hip.
3. Exert pressure downwards with your lower leg against the hand that is holding your ankle (i.e., try to straighten that leg against resistance, using only about ¼ of your full strength) Hold for 5 – 7 seconds and relax.
4. Try to bring your foot closer to your buttock and try to extend the thigh further back. Hold for at least 30 seconds.
5. Repeat once more, and then the entire sequence with the other leg.

Lumbar Erectors

Gravity-induced Spinal Stretch

1. Lie in the relaxation position, with a cushion or book under your head, and your arms out the side.
2. Allow both knees to fall to one side as far as possible without pain, to twist your lower and middle back muscles.
3. Your shoulders and feet should remain flat on the floor throughout the whole exercise.
4. Breath deeply and slowly for about 30 seconds, and then take a deep breath which you should hold for as long as comfortable.
5. On releasing your breath allow your legs to fall further to the floor and stay in this position for another 30 seconds.
6. Return slowly to the relaxation position, and repeat on the other side.

Sitting Twist Stretch

1. Sit on the floor, with your arms outstretched
2. Cross your left leg over your right leg at the knees
3. Place your right hand between your crossed knees and rest it on the floor.
4. Place your left hand on the floor behind your body, about 6 inches behind your buttocks, with fingers point backwards.

5. Twist to the left, to a comfortable limit, rotating your neck, shoulders and trunk – look over your left shoulder.
6. Stay in this position while you take a series of slow breaths, and increase the rotation slightly after 5 breaths.
7. Hold this new position for another 5 cycles of inhalation and exhalation.
8. Repeat on the other side, reversing all positions of legs, hands and turning.

Breath-assisted release of low back

1. Lie on your back – without a cushion
2. Bend both knees at the hip and knee and, with legs apart and a hand on each knee, pull your legs towards their respective shoulders.
3. When you reach the position with your knees closest to your shoulders, hold it and breath in and hold your breath for as long as comfortable.
4. As your breath is released, pull your knees a little closer to your shoulders (not your chest), and hold this position for 30 seconds while breathing normally.
5. Release and repeat once more.

Prayer Position (upper back mobilisation)

1. Get onto your hands and knees, with your thighs and arms perpendicular to the floor and your fingers pointing towards one another.
2. Bend your elbows to allow your head to drop towards your hands, keeping your head as upright as the position allows.
3. Breathe normally, and on an exhalation, take your chin as close towards your hands as possible, and sitting back, 'slide' your head back, keeping your chin close to the floor.
4. Inhale and lift your head and shoulders, returning to the start position.
5. Exhale while you sit back, lower your chin to the floor and slide your head forward towards your hands.
6. Repeat each action five times, inhaling as you return to the start position, and exhaling during the 'slide.'

Iliopsoas

Hurdler Stretch

1. Kneel on a sofa scatter cushion with your right knee (this helps to take the pressure off your kneecap). Bend your left leg up in front of you, bent at the hip and knee at 90 degrees each, with your left foot flat on the floor, and with your back vertical. You may want to do this along side the arm of the sofa or the bed if you feel unsteady. Keep your legs parallel to each other - don't let them splay out sideways - imagine they're on railway lines.
2. Place your hands on your hips, look into the distance (not at your feet), and gently move forwards with your trunk, leaving your right knee behind on the cushion. Find the barrier point in the front of your right thigh / groin. Bend at the hip joint, try not to arch your back excessively.
3. Move gently backwards and forwards in and out of the barrier point for a few minutes, until the stretch in the thigh has gone.
4. Straighten up again, and move your right foot forward a few inches, and try no.2 to no.3 again.
5. Repeatedly move forwards with your left foot until you can extend your right leg well behind you, and the stretch in the thigh has gone. Remember to keep your trunk vertical, and keep looking into the distance, not at your feet.
6. Try no.1 to no.5 with your left leg.

MET Stretch

1. This stretch helps tight iliopsoas and quadriceps muscles at the same time.
2. Lie on your left side, bringing your left hip and knee up to 90 degrees. Hang on to your left knee with your left hand.
3. Bring your right foot towards your buttock, and grab your foot with your right hand. Make sure that your legs are straight, and not splayed out sideways.
4. Making sure that your left hand does not allow your left knee to move (this protects your back by preventing it arching backwards), use your right hand to pull your right heel towards your right buttock. Stop at the barrier point in the right groin and thigh.
5. Take a deep breath in and hold it. At 25% maximum effort, try to bring your right knee forward, but counter balance it by pulling with your right hand. Hold this for FIVE seconds.
6. Breath out quickly, letting your right leg relax, but not your right arm. In the next THREE seconds, pull your right foot further towards your buttock to find the new barrier point in the right groin and thigh.
7. Repeat no.4 to no.5 several times. The aim is to be able to extend your right thigh backwards beyond the line of your trunk. If you look down your body and your right knee is still protruding forwards, then you haven't gone far enough. Remember, hold on to your left knee always to protect your back, and don't let your legs splay sideways.
8. Try no.1 to no.6 with your left leg.

Thigh Adductor Stretch

Sitting Stretch

1. Sit up straight on the floor with your knees drawn up and apart, and your feet sole to sole resting on the floor. Your feet should be about 30 cm away from your bottom.
2. Place your elbows on the inside of each knee. Gently push your knees apart with your elbows to find the barrier point in the inner thigh.
3. Move in and out of the barrier point for a few minutes until the inner thigh stretch has gone.
4. Move your feet closer to your bottom a little, and repeat no.2 to no.3 several times.
5. The end point is when you have moved your feet as far as they will go towards your bottom, and your knees as far apart as comfortable.

MET Stretch

1. Do no.1 and no.2 as above to find the barrier point.
2. Take a big breath in and hold it for FIVE seconds, whilst using your elbows to push your knees apart, counter-balancing this by pulling inwards with your knees.
3. Quickly breath out, relaxing your leg muscles but not your arms. In the next THREE seconds find the new barrier point by letting your elbows push your knees further apart.
4. Repeat no.2 to no.3 until your knees are as far apart as feels comfortable.
5. Repeat no.1 to no.4 after bringing your feet closer to your bottom.
6. Try to move your feet as close to your bottom as they will go.

Hamstrings

This also stretches the lower back.

1. Sit on the floor with your legs outstretched.
2. Bend forward as far as comfortable and grasp your legs.
3. Sit up against resistance from held position for ten seconds.
4. Relax, and then bend further forward and grasp again. Hold for 30 seconds.
5. Repeat.

Tensor Facia Latae

1. First get on hands and knees,
2. Point your toes
3. Extend one leg all the way back until your buttocks is over your other ankle, i.e. sit on your left foot (with your right leg extended behind you).
4. Then simply translate your pelvis to the left, as shown so that your knee is under your body.
5. And for the advanced, if this is not enough, then lower you upper torso closer the floor, relax and let the weight of your body do the stretch.

1. Stand sideways-on to a table or counter that is waist heigh.
2. Cross the foot from the leg nearer the table, over the other foot.
3. Placing your hand on the counter for support, tilt your hip outward so that you start to feel a good stretch in your TFL.
4. Hold for 30 seconds.
5. Repeat other side.

QL

1. Stand with legs 18" apart, bend sideways (away from the side you are treating – not at all forward or back) as far as you can comfortably go.
2. Breathe in while you unbend a couple of inches. Hold breath and mild contraction, against gravity, for 10 seconds.
3. Exhale and relax to increase side bend. Hold stretch for 30 seconds.
4. Repeat, and then do other side.

Tests for weakness

Gluteus Maximus

Gluteus Maximus – weakness test (Chaitow 135)

- Lie face down
- Bend the knee and lift the thigh of the side to be tested, without arching the back
- If you can't hold this for 10 seconds – poor endurance
- Test also for short / tight psoas straight leg lift or modified Thomas test.

Gluteus Maximus Toning

Prone buttocks squeeze

This exercise strengthens the buttocks muscles, which support the back and help you lift with your legs. It is known as the "squint" when done standing.

- Lie flat on your stomach with your arms at your sides.
- Slowly tighten your buttocks muscles and hold the position (not your breath) for 5 to 10 seconds. Relax slowly.
- You may need to place a small pillow under your stomach for comfort.

Prone gluteus maximus hip extension

- Lie face down
- Flex knee to 90°
- Extend hip, emphasizing the action of the gluteal muscles.
- Hold – starting at 3-5 seconds, increasing to 30 sec.
- If can't do at first, helper lifts leg, and client tries to hold, or to control drop. Move from most passive to most active – start with 10 repetitions of 10 second contractions

Stretch hip flexors, if necessary

Half lunge stretch for hip extensors

- Half kneel and tighten lower abdominals (navel to spine)
- Pad (folded towel) under knee, use chair to hold on to, if necessary.
- Press pelvis forward, without tilting.
- 10 reps, holding 20 seconds

Gluteus Maximus Stretch

Gluteus Medius

Gluteus Medius weakness test (Chaitow)

- Lie on side
- Keep lower leg straight and upper leg flexed to about 80° at the hip and 90° at the knee, foot resting on the floor
- Using foot as a pivot, raise the knee sideways by at least 45°
- You should be able to hold this position easily for 10 seconds. If you cannot, gluteus medius is inhibited and lacks endurance.

Test for short QL (side bending), Piriformis (foot or leg turned outward during supine lying) or adductors (can't abduct in supine more than 45%)

Gluteus Medius Toning

- Adopt position as for weakness test, knee raised from floor by at least 45°
- Hold this for as long as possible and lower slowly
- Rest and repeat up to five times on each side.

Stretch for QL – MET

- Stand with legs 18" apart, bend sideways (away from the side you are treating – not at all forward or back) as far as you can comfortably go.
- Breathe in while you unbend a couple of inches. Hold breath and mild contraction, against gravity, for 10 seconds.
- Exhale and relax to increase side bend. Hold stretch for 30 seconds.
- Repeat, and then do other side.

Stretch for Piriformis

- Lie face downwards
- Your leg on the side to be treated should be bent at the knee and your lower leg allowed to fall outwards, rotating your upper leg internally.
- When all the slack has been taken out (complete relaxation), your foot and lower leg should be moved slightly towards the upright (an inch) and held for 15 seconds before being released and allowed to fall outwards, again into rotation, for a further 30 seconds.
- Repeat once more

Stretch for Adductors

- Sit on the floor, with feet together (soles touching) and knees as far apart as possible
- Rest your hands on the inner aspect of your knees and push thighs outward as comfortably as possible.
- Press in with your knees while pressing out with your hands, so that there is no motion – use no more than ¼ of your strength – holding for 7 seconds. It may be more comfortable to cross your arms for this.
- After the contraction, release pressure inward, and your legs may be able to travel further apart.
- Repeat the sequence once more.

Gluteus medius stretch

Iliopsoas

Iliopsoas strength test

Sit on an upright chair, with your spine in neutral, and, keeping the knee flexed at 90°, raise the leg on the side to be tested a few inches.

If the psoas is normal, you should be able to raise and hold this leg for 10 seconds before lowering and repeating the raise and hold nine more times, without either of two things happening.

1. losing your upright, neutral, spinal position, without slumping
2. your muscles starting to quiver or twitch, or simply not being able to perform the 10 repetitions.

Iliopsoas toning

Perform the strength test once or twice daily, until you can perform it without strain.

Pelvic diaphragm toning

Hold your nose and try to breathe in. Focus on your pelvic floor muscles. Do a few times a day, until you can do the exercise without holding your nose.

Core stability

Exercises for core stability

Core stability exercises improve the muscular corset around the back. It is important to isolate the exact muscles for the desired effect. If the whole tummy is tensed up the stability muscles do not strengthen up well.

Researchers tell us it is only necessary to tense the muscles up to about 25-30% of their maximum capacity to get the best effect. So trying very hard when doing these exercises is not helpful.

All the exercises are held for 10 seconds each time and done 10 times each - a total of 100 seconds. Three times a day is enough initially.

Exercise One

Lie on your front in a relaxed position. Tighten up the “pelvic floor” as if you are trying to stop yourself passing water, then imagine there is something hot under your tummy and try and draw it to your backbone. Do not tense up the chest or lift your hips off the surface. Once you have this, remember to keep breathing normally, not fast or particularly deep breaths.

Hold for ten seconds then relax. Give yourself a short time to recover then repeat the process until you have done it ten times. You will find that when you breathe the muscles will tend to slacken, and when you tighten the muscles you'll stop breathing. Work steadily until you can do both easily at the same time.

Exercise Two

Lie on your back with your knees bent. Gently tense up the pelvic floor again as this usually tenses up the correct muscles in the abdomen. You can add a gentle drawing down of the tummy button towards the spine. Breathe normally as before and hold for ten seconds each time.

- Exercise Two - first progression
- Tense up the muscles as in exercise two. Hold the muscles tense and your pelvis stable while you let one bent leg gently out to one side a short way and back. Repeat with other. Five each.
- Exercise Two - second progression
- Hold as in the previous exercise, then lift one foot an inch off the floor only, and hold. Try and allow no movement apart from the small leg lift. Five each leg.
- Exercise Two - third progression
- Tense up the muscles and hold. Bend the left leg up towards the chest, reach out with the right arm and gently push against the left thigh, holding 10 seconds. Alternate for five each leg.

Standing and sitting

By now you should be able to tense the correct muscles in standing and sitting and may not need to lie down to practice them anymore. You can also tense them up when doing stressful activities such as lifting a suitcase or whatever the particularly difficult movement is for you. Do them many times every day for the greatest benefit.

If you want to go to an exercise class which will help this problem, then Pilates is the best choice.

The waiter's bow

Stand up with good posture; knees soft, lumbar spine in neutral, head up and shoulders back and relaxed. Breathe in and relax. Breathe out and as you do so perform the abdominal hollowing action. Keeping the tension, slowly lean forward from the hips 20 deg and stop, like a waiter's bow, keeping your back completely straight and long as you lean. Hold the lean position for 10 seconds - you will feel your TA and MF supporting you if you hold the correct position. Keeping the tension and the alignment, slowly return to your start position. Repeat 10 times. Again, remember the coaching points from above.

These exercises are two examples of learning how to keep the spine in neutral, using slow and controlled, static contractions of the trunk stabiliser muscles. Notice how technique is vital and the aim is to build up the time you are able to maintain good stability.

Getting functional...

The ultimate aim of core-stability training is to ensure the deep-trunk muscles are working correctly to control the lumbar spine during dynamic movements, e.g., lifting a heavy box or running. Therefore it is important that once you have achieved proficiency of the simple core exercises, you must progress on to achieving stability during more functional movements. I have chosen two examples.

(1) The lunge

A classic exercise, but done slowly and with care it can teach you a great deal about body awareness and core stability. Interestingly, it is used by Alexander Technique teachers to help establish better movement patterns.

Stand with feet hip-width apart in front of a mirror. Ensure your lumbar spine is in neutral and your back is tall with your shoulders back and head up.

Lunge forward and bend your knee only half way down. Ensure that your front knee is in line with your toes and your back has remained upright with your lumbar spine in neutral and your hips level.

Push back up, initiating the movement by pushing down into the floor with your front foot. The force from your legs should bring you back up quickly and easily to your start position. Your back should have remained totally still and your hips level as you performed the push back.

Many people wrongly initiate the up movement by pulling their heads and shoulders back first; this extends the lumbar spine, losing the neutral position. Others have problems keeping their pelvis level while performing the lunge. You must learn to use your deep trunk and gluteal muscles to hold your lumbar spine in neutral and pelvis level as you perform the movement up and down. The movement should only come from the leg muscles.

(2) The press up

Another classic exercise, but more often than not it is performed with questionable core stability. Start from your knees - even if this means it is easy for your upper body - to learn the correct technique.

Your hands should be slightly wider than your shoulders and your head must be in front of your hands. Lift your hips so that there is a straight line from your knees through your pelvis and lower back, through your shoulders and all the way to your head. Ensure your lumbar spine is in neutral, using a mirror or a partner/trainer to help you. To maintain a neutral spine and a straight back during the exercise, the trunk muscles must provide active support. Slowly lower down, bending your arms all the way to the floor. Keep your head still with your neck straight relative to your back. Push up, initiating the movement by pressing down into the floor with your hands. Your back should remain still, straight and your lumbar spine in neutral throughout.

Many people allow their lumbar spine to arch and sag downwards as they perform the press up; this is because they are not using their trunk stabilisers enough to support the body.

These two exercises, used in a non-traditional manner, enable you to learn core stability while performing dynamic movements. By reducing the resistance - i.e., doing only half lunges and knee press ups - you are able to focus on the trunk stabilisers and achieving perfect technique rather than working the major muscle groups. The whole essence of core stability training is quality of movement and relaxation. The more you practise, the easier it becomes until you can control your lumbar stability at all times and during complex movements.