



By Alan Williams

Corrective Exercise for back pain

Exercise is good for you, you are told – but why do some people not get the results or benefits they are looking for and why are some even fearful of starting an exercise programme? Could it be that there is a specific exercise prescription for you as an individual? After all, you wouldn't take someone else's medication, would you? An appropriate exercise programme will not only help you recover from injury, but also improve your overall body movement by incorporating exercises performed in a safe and productive way. And, if you are among the many people who suffer from back pain, you may find just the answer you've been looking for.

Why do you have back pain?

There are many different causes of back pain, which can be experienced in the lower back (lumbar spine), mid and upper back (thoracic spine) or even the neck (cervical spine). It can also be closely related to your pelvic and shoulder girdles. If you suffer back or neck pain, do you know why? Are you aware of which structures and tissues of the body are causing those symptoms and why? If not, you are not alone because many people who experience pain are not aware of the many and varied reasons why they should do certain exercises and avoid others to alleviate or manage that pain. Indeed, many people have put up with back pain for many years and still are unsure why and what they can do about it. This can be for several reasons, which may include not having been diagnosed correctly or accurately initially, having attended an inappropriate source for help, or not seeking expert advice at all.

If your car is not working well, or not driving smoothly, it would make sense to take it to a specialist (a car mechanic) to find the source of the problem, the reason why it is not functioning properly, and to take measures to solve the problem before it spreads to affect other parts of the engine or chassis. The reason you do something about it is because if the problem is left alone without correction, things will usually only get worse. The human body is very similar as when structural or functional problems arise, the body will make every attempt to self-correct, and compensations will occur in order to lessen the impact of the problem. But this can cause minor problems or adaptations elsewhere, which can then escalate and cause further problems. And a vicious cycle can ensue. So, an accurate diagnosis or assessment needs to be made in order to implement the appropriate changes or corrections to remedy the situation.

The causes of back pain

Many body tissues are involved in the production of back pain. These include: inter-vertebral disc degeneration, disc disease, disc strain or bulge, prolapsed or herniated disc, apophyseal (facet) joint strain and irritation, joint capsules, ligamentous instability or sprain, muscle strain, muscle imbalance, and muscle over-dominance. Different structures or tissues can cause pain in different body positions, postures, movements and activities of normal daily living (such as dressing, brushing teeth, sleeping, lifting and driving).

Why would you need to know which tissues are involved in your particular case?

If you know where the pain comes from and why it comes at certain times, and you know which movements to be careful with and which to avoid altogether, and probably most importantly, which movements (or exercises) to do regularly, you can actively help solve or manage the problem. Remember, the aim of treatment for back pain, and of corrective exercise prescription, is to become healthier and more aware of how to handle your body more efficiently and effectively. This will not only prevent aggravating your initial condition, but also contribute to preventing further compensatory problems later on. In this way you can be 'for-warned' in order to be 'for-armed' and prevention is always better than cure.

When does correct exercise become corrective?

You may already be taking part in an exercise programme involving various exercises, with or without supervision, and doing them regularly either at home or at a gym. Your purpose will obviously be to perform each exercise correctly, according to whoever has described or shown you that exercise. Often people learn how to perform an exercise from a picture in a magazine, or from someone else who does that exercise and has had good results. But you are an individual with individual needs, and possibly a history of pain, dysfunction and bad experiences with exercise as a whole.

How does an exercise become corrective for you?

Firstly, by the very nature of the definition of corrective, it implies something needs correcting, that there is a situation that needs rectifying, or changing for the better. Therefore, that exercise needs to actually contribute to that change for the better. Hence, it needs to be performed correctly so it is safe, but it is only chosen because that particular exercise will have a positive effect on the condition or problem needing that change. You are to be changing something for the better.



Many times I have witnessed people doing an exercise in poor form (technique), and that exercise itself being the worst possible choice for the individual in question. For example; several years ago the craze amongst fitness enthusiasts seemed to be to recommend people with back pain to do crunch sit-ups on the floor. The belief or justification being, that if the abdominals were strengthened it would protect the back irrespective of whether the back muscles were given any exercise or not. Where this recommendation came from is uncertain. Now, crunch sit-ups can be incorporated into an exercise programme, using a gym ball for instance to increase the range of motion of the exercise to also build strength in the weakest range of motion (when the body is lying back over the ball). A crunch-sit up on the floor, however, limits the range of movement, as the amount of backward bending is limited by the floor itself, which prevents the abdominal muscles from being trained in their weakest range of motion. However, they can still be part of a programme that also includes exercises for the low back muscles themselves. So, correct performance is important and will also dictate the breathing pattern used, whether to breathe in or out when doing the 'crunch'. However, this particular exercise movement is only corrective if it improves (or attempts to improve) the condition that the individual has. For instance, if someone with a spinal (inter-vertebral) disc bulge or herniation does this exercise (and does it incorrectly), it will adversely affect the condition and worsen the very problem it is given for (as it will increase disc pressure by compressing its structure). So, without sufficient knowledge of the individual and the condition, and without

specific knowledge of the exercise itself and how to modify it accordingly, there will be a change but for the worse. And an unsuccessful movement experience is counter-productive to the neurological re-education needed in order to get the individual moving, and feeling better. The reason being that it is our nervous system which controls how our muscles work in combination with each other, and exercise can be used to re-learn effective and efficient integration of movement patterns.

The difference that makes the difference

What would you do if you took up a sport like tennis, or swimming? And you wanted to compete at a certain level or just play for fun?

Your needs would be to consider the following: the techniques of the game/sport or strokes, body position, practice, addressing weaknesses, building upon strengths, balancing the overall game or technique, preventing injury or strain.

Now what if we apply this to daily life, or hobbies, or work situations?

You need to consider very similar things: the techniques of the activity, practice, good form, and avoidance of injury or strain. The same factors apply and both situations require attention and awareness, something that is often present when playing or learning a sport, but not necessarily present during the second example when focus of attention is on other things, such as activities of daily life as these are often taken for granted and done the way you have always done them, or seen them done.

So, what are the movement needs for normal everyday life?

Various movement patterns or sequences are essential to normal human function and include: squatting, bending, lunging, lifting, twisting, pushing, pulling, and usually a combination of one or more of these. To complicate the matter, these movements are performed whilst attention may be on other things other than the performance of the movement. For instance, when gardening how often do you think about how you bend, or how you twist and tug to pull something out of the ground? In the gym you would be very careful how to bend, lift or twist if there was a weight involved or when using a piece of expensive exercise equipment. But in the garden, you just get on with it, and often injure yourself as the garden, or the workplace, can be just as potentially dangerous a place as a gym if misused.

Core Function and Core Control

The 'core', as it is sometimes referred to, is the entire torso (upper body) whilst the extremities (the upper and lower limbs) rely upon the core for stabilisation and force production. The core can be thought of as an action centre and has very important functions that include:

- Protection of the central nervous system and internal organs
- Support for the internal organs and to provide gentle mobilisation of them through movement
- To improve circulation and the fluid dynamics (flow) through the organs
- Support for the circulatory systems, by helping the heart to circulate blood and lymphatic fluid around the body

- To provide a strong, stable foundation for body movement without which the spine and extremities would not function properly which can predispose to injury.

The Inner and Outer Units of the Core

The core unit of the body, as it is described above, can be seen of as having an inner component and an outer component, each having specific functions to perform. In a balanced body these functions support and supplement each other through coordinated action allowing for smooth and efficient, and effective movement production throughout the entire body.

Stability

The inner unit comprises the deep spinal muscles (multifidus), pelvic floor muscles, the deepest abdominal muscles (transversus abdominis) and diaphragm. The internal oblique and latissimus dorsi also assist the inner unit. Their job is to stiffen (stabilise) the spinal column, rib cage and pelvic girdle so that the head, arms and legs have a strong, stable foundation from which to act. Stabilisation begins in the inner unit muscles and progresses outwards towards the periphery.



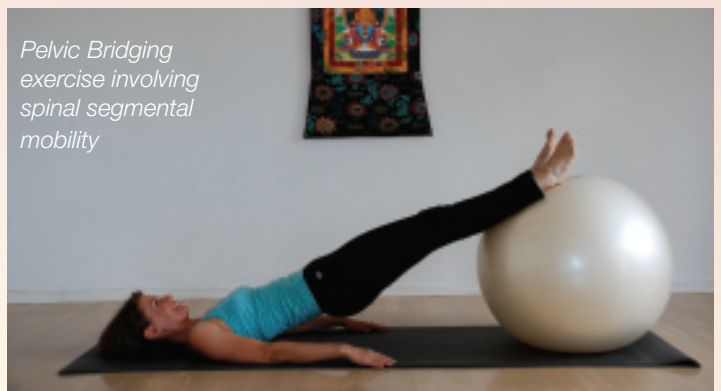
'Four point kneeling' exercise challenging core function and stability

The 'Four Point Kneeling' exercise is great for increasing spinal stability of the lumbar (lower back) area as the deep spinal muscles, the abdominal and lower back muscles all have to function together to produce a stable position. The object of the exercises is to be able to maintain this position without losing the basic body shape or alignment whilst balancing on one hand and the opposite knee and foot for support. This will be invaluable for anyone with a weak lower back or poor posture.

Mobility

The outer unit consists of the muscles designed to move (mobilise) the body, such as rectus abdominis, internal and external obliques, and erector spinae. Think of the outer unit muscles being like the powerful engine in your car, whereas the inner unit muscles can be thought of as the suspension system that functions to hold everything together and prevent shock and stress from damaging structures.

'Pelvic Bridging' is an exercise which involves lying on the back with knees bent, and then curling the spine up off the mat beginning with the lower spinal segments (down near the belt area) and moving up towards the shoulder blade (mid back) area to reach the position shown in the picture. It is important to attempt to 'peel' each vertebra up from the mat, as if peeling tape off from a table, so that each joint of the lower and mid back is moving independently. This helps



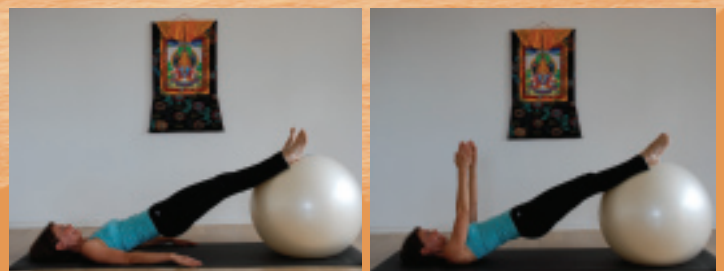
Pelvic Bridging exercise involving spinal segmental mobility

to restore spinal mobility throughout the spine and distribute movement between all the joints. This will help to rebuild an individual's confidence in being able to move the lower back in particular.

Corrective Exercise, Pilates and more...

Many forms of exercise can be used as corrective exercise, and **Pilates** is especially effective as it can be used to strengthen the body from the inside out. Too often the outer, larger muscles of the body are over-emphasized when training, and the inner stabilizing muscles can be overlooked, ignored or neglected. This can lead to a state where the outer muscles are over-dominant (too strong for the associated underlying muscles) and can even put undue strain on the joints due to the fact that the smaller, deeper stabilizing muscles have become de-conditioned. So, strengths get stronger while weaknesses remain a weak link. The inner and outer units can be trained to function together more correctly and harmoniously to maintain balance throughout the body as they provide the stability and foundation for movement. In the case of individuals with back pain, if focus is initially placed on the inner unit, providing stability, a solid foundation is created so that the outer unit can then function properly without it placing undue strain of the spine or structures related to it.

There are many exercises that can be used specifically to improve stability of the spinal segments, and many that can be used to increase mobility throughout the entire spine or specific sections of it. Some exercises can be used to incorporate stability and mobility at the same time. Therefore, if someone needs stability of their spine to be improved, it would be wise to select an exercise that will work on their stabilising muscles, and not just move the spine through as large range of movement. In this way the exercise becomes specific to the individual needs and will be corrective for the particular situation.

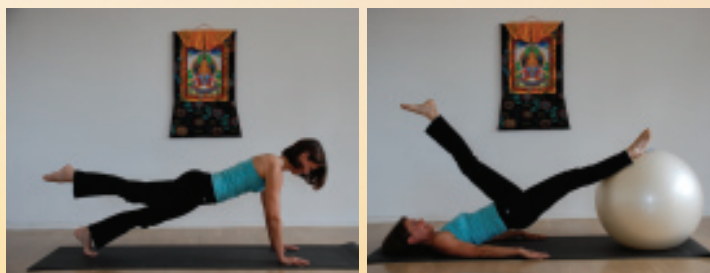


Exercises challenging spinal mobility and core stability

The Swiss ball (gym ball) can be used to provide an unstable surface on which to balance. This can present the nervous

system with an opportunity to recruit the deep spinal muscles (to maintain stability) along with the more superficial and surrounding muscles that are producing movement. Hence, stability and mobility are challenged in the same exercise.

The beauty of corrective exercise is that it can be directed to any body part with various aims, such as increasing stability, range of motion, or quality of motion. A single exercise can accomplish more than one aim. For example, the Leg Pull Front movement in Pilates can improve upper body strength, shoulder girdle stability, spinal stability, spinal rotatory stability, and strength of the hip extensors (gluteal and hamstring muscles) all at once. It can also be done to correct body alignment issues. All of this in just one exercise, but this would not be an exercise of choice for a beginner without first working through other more appropriate exercises.



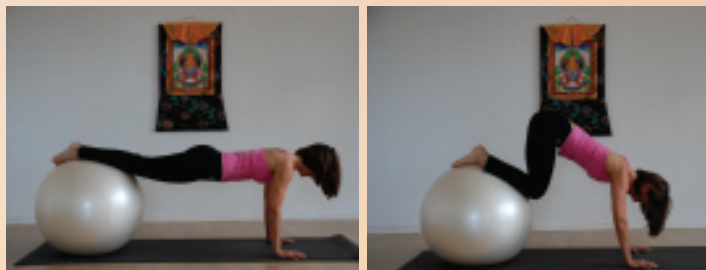
The Leg Pull Front exercise

A variation of the Leg Pull

The scope of corrective exercise

If an individual needs to focus on their breathing, or alignment of their spine, or increase their 'core control' (it isn't just about stability, but control of stability and motion), or how they organize their shoulder or pelvic girdles, all of this can be achieved through appropriate exercise selection. Mobility of the spinal joints is so important to everyone, especially as they get older and develop certain postural or work habits. How movement is integrated throughout the body can also be improved, so that the whole body works as an efficient unit, instead of merely a collection of parts. If you consider an orchestra, how would it be if one or two instruments were playing either too loud, or at the wrong time within the music, or even the wrong notes? The effect would affect the entire orchestra and its performance. Well, within your body you have an incredible orchestra of muscles and ligaments, joints and capsules, various limbs and organ systems all working together, or attempting to work together despite what people do to themselves. Wouldn't it be wonderful to get all those instruments tuned and playing together in complete harmony and balance? Think what you could do or achieve. Now, if you suffer from back pain, it is very likely that some

of your spinal muscles are de-conditioned to a considerable extent and need specific strengthening to maintain spinal stability and mobility to allow and produce efficient and effective movement. This is important not only in the gym, swimming pool, or on the sports field, but even more so at home, in the office and when playing with the kids, as this is the time when your attention may not directly be on your movement performance.



Exercises challenging movement integration, including spinal stability

Which prescription is right for you?

Knowing which exercise to do for the best effect is largely determined by the specific condition of your own body. However, it is also important to consider the past events and injuries which have led up to this point, and the larger overall picture of your individual lifestyle. It is also wise to consider what type of exercise you like doing, whether you like the more intense types of exercise or prefer more calm approaches. How much time you can spend exercising is another important factor, so an exercise which serves several purposes all at the same time will be invaluable for people who have little time available. But each exercise can be adapted to suit your own specific needs by modifying the exercise accordingly.

So, the scope of corrective exercise, making an exercise corrective for you, is a skill worth exploring as most people are usually functioning well below their capacity without actually knowing why. It is well worth the time spent finding what is going to really help you as this may save years spent doing the wrong thing. Remember to take your prescription wisely.

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