

# *Understanding Your Back Pain*

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## *Introduction*

Back pain happens to everyone and for some is a life changing occurrence. The causes are as many as there are structures capable of producing pain – and every tissue in the body is capable of giving us pain. Help from the health care profession is sought when the pain is severe enough to interfere with activities we need, or want to do. What happens next depends on who you choose to consult.

There are many health care practitioners who treat back pain – the family doctor, chiropractor, physiotherapist, massage therapist, acupuncturist, orthopaedic surgeon, neurosurgeon, anesthetist, rheumatologist, psychiatrist and psychologist to name but a few. Each approaches your problem from a very different perspective which is based on their formal training and their clinical experience. Their training/experience helps them to develop models some of which are based on scientific principles and some on long time common thought.

Back pain has been subjected to scientific research, so what does the research tell us. First of all consider the questions we have asked in the research. It's important to understand the question because it ultimately directs the answer. If one is interested in understanding "What structure is responsible for an individual's pain?" then the research will focus on specific anatomical parts capable of generating pain. Entire models for both assessment and treatment of the low back have been developed following this line of questioning. Highly sophisticated imaging techniques and surgical procedures have been developed to address this question – "What is hurting?". This would be useful clinically if only one structure was responsible for an individual's pain. Unfortunately, multiple structures are often the problem and it is not possible to identify them individually. So we see diagnoses such as 'non-specific low back pain'. In other words, the pain is not specific to any identifiable structure however, your low back pain is acknowledged. Even if we did know what structure was responsible for the pain, this would not help us in treatment unless all we wanted to do was cut it out or numb it with an anaesthetic – sometimes this is necessary but rarely is this all that is needed.

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What information would be gained if the initial research question was “*Why* is the low back or pelvis painful?” “*Why* is the back no longer able to sustain or transfer the loads, stand, sit, lift or twist?” To answer these questions, the research must explore *how* the region functions in order to appreciate *why* breakdown and pain have occurred. Much research has been done with these questions in mind and today we have a new model which considers both function and how emotional factors such as stress and anxiety can influence the pain experience.



Living on Earth means that we are never able to escape the influence of gravity. Being upright (bipedal) requires that the gravitational forces be transferred through the low back and pelvis to the two legs. How effective we are at transferring this load over a lifetime dictates how well we can stand at ease, move at will and react when necessary as we age, in other words how well we function. Dysfunction implies that the individual has lost the ability to resist gravity while standing, sitting, lifting etc.

Transferring loads effectively, whether the load is merely our body weight or the addition of extra loads (groceries, children, tool boxes etc), requires proper function of the bones, joints, muscles and nerves.

Collectively, all of these systems must be working together to produce smooth effortless movement. The bones can't be broken or effected by disease, the joints must be mobile and yet their motion controlled, the muscles must be strong and flexible and the nerves must act as a highly sophisticated information system transferring knowledge from the periphery to the brain and back.

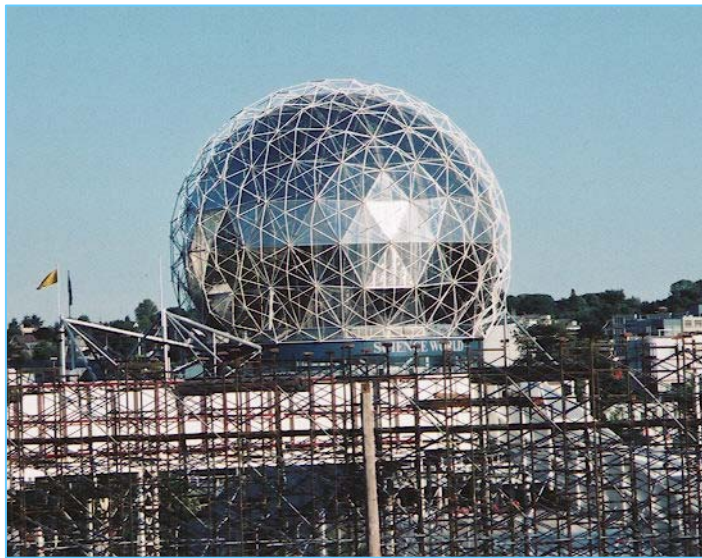
Gravity tries to push us into the ground and this force is called compression. Compression forces the bones of our back together and buckling is, in part, prevented by the structure of the joints and also the intervertebral discs.



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When your back is under more compression than it can handle, in other words when it is not being supported by the muscle system, the discs begin to bulge and the joints begin to wear out. The doctor looks at your X-ray, sees the narrowing of the disc spaces, has a CT scan or MRI done and confirms that the intervertebral discs are bulging, considers your age and tell you that you have degenerative disc disease. This is not a disease but rather a statement indicating that you have fallen victim to the compression force of gravity and haven't been using your muscle system well enough to counteract it. The structures of your back are showing the signs of too much compression and telling you about it by sending you pain signals.

How does the muscle system resist gravity? To understand this, we need to first consider Buckminster Fuller's geodesic dome – a building like Science World. The building is supported by balanced tension wires, small triangles linked together in a



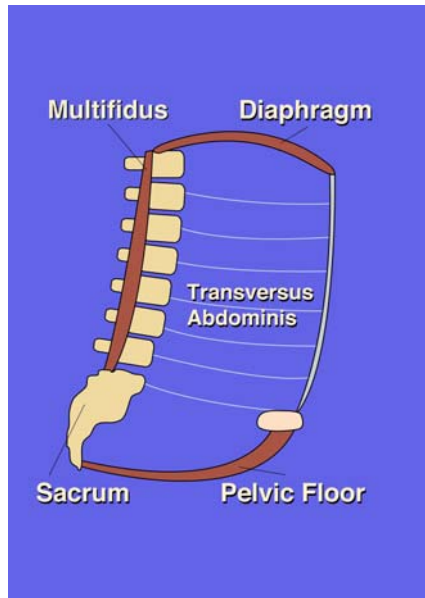
balanced fashion, like a tug-of-war. In architecture this balanced tension system is called tensegrity – tension integrity. The net result of balanced tension forces reduces compression. This is how a ballerina can balance and spin on pointe and not break down her feet over a career.

A bicycle wheel is another good example of tensegrity. The hub of the wheel is held in place by at least 12 spokes, the tension force of each spoke is equally balanced by an opposing one. Thus the wheel turns and the hub stays stable. The load of the bike and the person on it is transferred to the ground through a tensegrity system.

Our low back and pelvis functions like a bicycle wheel in that we have a core (hub or axle) which is not a specific structure but rather a place located in the low abdomen supported by a number of muscle systems which help to suspend the low back and minimize compression through it.

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Let's talk a bit about this muscle system. It has long been thought that a strong abdomen help relieves back pain. While true in part, it's not quite so simple, situps are not the cure for back pain. The key muscles which support the core are the transversus abdominis, multifidus, the pelvic floor and the diaphragm.

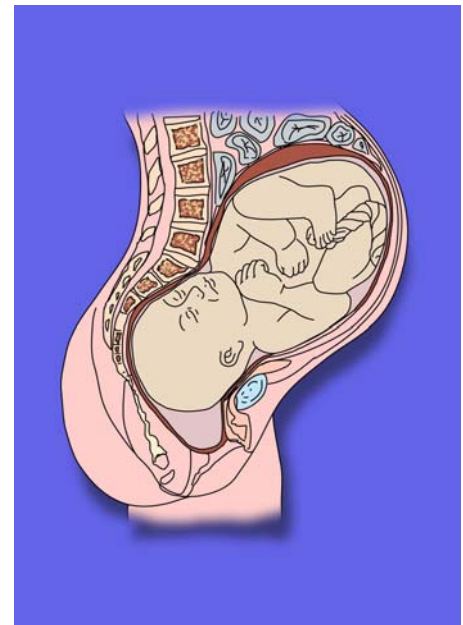


The transversus abdominis is the deepest abdominal and attaches to the bones of your back posteriorly, the lower six ribs and runs around your trunk to the front of your abdomen reaching the same muscle on the opposite side through a layer of fascia. Below, it attaches to the top of the pelvis all the way around. This muscle is like a corset in shape and in function. When it contracts it draws the bones of the pelvis together and stabilizes them.

In the low back, this muscle tightens a very thick midline fascia called the thoracodorsal fascia. This fascia has other muscles attaching to it as well and when transversus abdominis contracts it helps to stiffen it so that loads can be transferred through it – this is tensegrity in action. The centre of this tension circle is completed by the multifidus muscle. Multifidus is a multisegmental midline back muscle which weakens whenever you hurt your back. It completes the circle of tension initiated by the transversus abdominis and therefore is very important in stabilizing the individual bones of your low back and pelvis.

There are four muscles which make up your pelvic floor and they are very important not only for preventing your pelvic organs from falling out but also for stabilizing your sacrum which is the midline bone of your pelvis. When all of these muscles are acting properly you have a core of support which is like the shape of a pyramid.

Take a look at what happens during pregnancy and delivery – this is a common time of onset for low back pain in women. The transversus abdominis gets very stretched and its action does not return spontaneously



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after delivery. Sometimes this muscle is cut during a Caesarian section. The pelvic floor is often torn or cut and very little attention is paid to rehabilitating this muscle after. As a result, the posterior back muscles (multifidus and erector spinae) and the posterior pelvic floor (coccygeus) become dominant and transversus abdominis and the anterior pelvic floor become weak. The spokes of the wheel have different lengths and tension abilities and do not control the position of the hub as the wheel is turning.

Excessive overuse of these two muscles increases compression posteriorly through the low back and pelvis and over time leads to structural changes (arthritis and disc protrusions) in the bones and joints.

Activation of the deep pelvic floor muscles tends to go along with excessive use of the deep hip muscles which force the hip joint anteriorly. This can lead to groin pain and restricted hip movement during walking and running. We call these people butt grippers and you can identify them by the shape of the buttock. Yes ladies, pregnancy can change the shape of your pelvis but it has nothing to do with your bones – its how you're using your muscles!! If you can't swing your leg freely when you walk (because you are gripping it) you will put extra forces on the joints in your pelvis and low back. Over time these can become painful. What is hurting? The ligaments and joints of your posterior pelvis and low back. Why? Because you are using a muscle strategy which is ineffective for transferring loads freely and effortlessly.

What about low back pain in men? The pelvic floor is less often a problem but multifidus and transversus abdominis have been shown to get weak with that very first episode of low back pain. You lift and twist or have a fall and sprain a joint or pull a muscle and this throws the entire muscle system into imbalance. There is plenty of research now to support this statement. Without proper retraining, the imbalance persists, tensegrity is lost and the stage is set for recurrent episodes of back pain and future structural changes in your anatomy.

How do we treat this situation? Manipulation of the spine, massage and drugs all play a role in the treatment of low back pain, however it is the restoration of motor control and YOUR ability to maintain the alignment regained through the adjustments and massage that will dictate your long term recovery. This is achieved through exercises and changing movement behaviours/postures which restore balance to the core.

Core stabilization exercises are not unique to physiotherapy. You will find core stabilization as the basis of Pilates, Feldenkrais, some forms of Tai Chi, Hatha Yoga,

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Swiss gym ball classes and others, however not all of these programs will effectively restore your motor control if it is out of balance.

So where do you go from here. Ask yourself this question – Have I been seeking a structural diagnosis i.e. What is hurting? Do I truly understand my own muscle system and how I use this to stabilize my low back and trunk? Do I pay attention to the muscle system of my back when sitting, standing, lifting twisting or just use any strategy that comes to me. If you have back pain, you can't do this anymore. You need to find a physiotherapist who understands the principles of rehabilitative core stabilization and begin to restore your own tensegrity – it is never too late to improve your function, the muscles are there just waiting to be found. It won't be easy, it's not a quick fix, especially if you have lived with this pain for a long time but the journey is well worth taking. Take the initiative today and phone your local physiotherapists and ask them if they have an exercise program aimed at improving motor control and core stabilization for your low back and pelvis. If they know what you are talking about, you have found the right place to start.

*Empower through Knowledge, Movement & Awareness*

