GENLIFE
Regenerative Medicine

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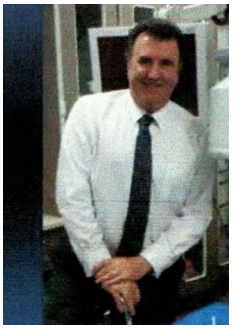
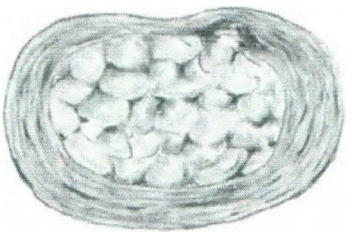
This article was dictated and written by my esteemed colleague, Dr. Michael Brown, M.D. DC. Dr. Brown was a wonderful teacher and superb doctor who passed away too young. The information dictated by Dr. Brown still remains pertinent today and I corrected spelling and grammar to make it more easily readable and I find it useful to provide to my patients. I hope you like it.

Charles F Mahl M.D.



The Intervertebral Disc Derangement:

INTRODUCTION:

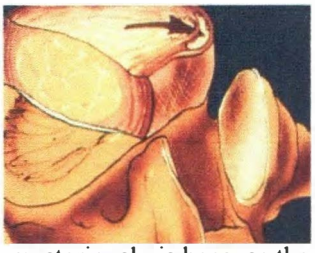


The term "intervertebral disc derangement" is a term that has been coined by physical therapists and manual therapy practitioners.[1,2] I borrow the term "disc derangement" which was originally coined by a physical therapist in New Zealand.[3] There is no universally accepted terminology to describe this particular syndrome. This particular physical therapist did popularized this term and provided a simplistic back pain categorization system which has become quite popular. We could just as well call this syndrome "the internal nuclear entrapment syndrome" or a myriad of other descriptive terms. Since the term "internal disc derangement" has sort of "caught on" we continue to use it by convention.

The intervertebral disc especially in the lumbar spine has unique anatomical features. The outer fibers of the disc as seen in the drawing to the left consist of a series of laminated rings similar to the plies of a radial tire. The inner portions of the disc are quite different. The inner portion of the disc which comprises most of the disc has the consistency of "beef fat or chicken fat" depending on a person's age. This material within the disc is mobile. When we bend forward and the vertebra closed in the front this material moves towards the back. When you bend backwards or extend the spine there vertebral close from behind and the nuclear material moves forward in the disc. This concept is central to our further discussion. Rarely do patients fully extend their spines. We spend the majority of our time in seated postures where the nuclear material moves toward the back of the disc. We frequently bend forward and stoop also creating the same nuclear migration backwards. Overtime, due to cumulative stress on the annular rings in the back of the disc, these annular rings become weak and breakdown. Soon small tears begin to accumulate. These tears coalesce into annular fissures providing a means for some of the nuclear material to move through the tear and become entrapped within the rings of the disc. This

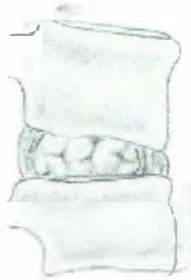
is the "set up". All it takes now is the right movement. You bend forward to pick something up or simply make the wrong movement and you suddenly develop a severe and often times a debilitating episode of back pain.

With such an episode you may find it difficult to stand up straight and you may experience a lateral shifting posture where you are unable to stand up straight.



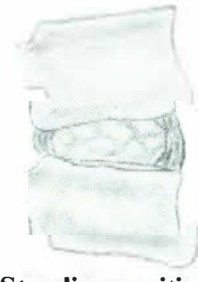
You may find it difficult to rise comfortably from a seated position often forcing you to hesitate for several moments before you can walk upright. You can be incapacitated for 3-7 days and suddenly the pain can disappear as mysteriously as it appeared. The cause of this episode of pain is a fragment of nucleus within the disc which has migrated its way through the tears in the disc and has become entrapped within the rings or fibers of the annulus fibrosus as shown in the picture to the right. The reason it disappears mysteriously is because the fragment of nucleus that is trapped in the walls of the annulus eventually works its way back into the center of the disc.

If you are overweight, and deconditioned and spent most of your time sitting and stooping the cumulating stress on the disc worsens the degeneration and tearing that occurs within the annulus making the disc more susceptible to these episodes. It should be noted that these episodes of pain can occur without any major injury or trauma. When the fragment of nucleus is entrapped within the fibers of the annulus (see picture above) your posture will often shift to take the pressure off that section of the disc which is why you often find yourself flexed forward or side bent during these episodes. The fragment can be lodged within the rings of the disc and can persist for days, weeks and sometimes months. If you are unaware of the cause of this painful syndrome you will be unaware of how quickly you can resolve the problem if you are just taught how. Patients often times seek care from chiropractors, physical therapists, massage therapist, physicians and surgeons and are never given the simple corrective movements that can resolve the problem. By empowering you with information on disc anatomy, and internal movement dynamics you can learn to literally "treat your own low back pain".



Sitting position

The lateral tilted or antalgic posture often associated with this condition is frequently misdiagnosed as muscle spasm. Patients can expect to walk out of the physician's office with a prescription of a "muscle relaxant". It is not an opioid medication or muscle relaxants that is the answer to this problem. The answer is often simply to resolve the mechanical problem with a mechanical therapy. The entrapped nuclear material will cause severe pain when an individual tries to extend her back when standing or tilt or side bend their back towards the side of pain. When you sit in a soft couch or chair with your back flat you simply cause the nuclear material to once again push into the fissure and further the entrapment. This is why every time this individual sits down it is difficult to get up. By sitting the disc undergoes a phenomenon known as "creep". So in other words as you sit down and the nuclear material migrates to the back of the disc. The nucleus can then become entrapped in the annulus and thus is a "set up" for pain when you try to stand up. As you begin to stand up the vertebra attempts to close in the back and open in the front. As this occurs there is an entrapment of the nuclear material within the annulus and you will experience increased back



Standing position

pain for a short period of time when you first try to stand. After taking several steps and the nuclear material begins to start to centralize and migrate out of the entrapped position your back feels better and you are able to walk better. Anyone who is experienced this phenomenon knows exactly what I am referring to. This is why it takes several steps before an individual can walk upright.

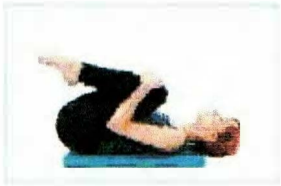
HOW TO TREAT YOUR OWN BACK PAIN:

We are going to discuss a method by which you can determine whether or not you have an internal disc derangement and how to treat it. The method that we will use is simply to monitor your response to in range spinal movement. You may have been given exercises that require you to pull your knees to your chest and flex the spine. Although this can occasionally be correct it is usually counterproductive and the incorrect movement to perform especially when you have the syndrome that is described in this document. It is much more common for the corrective movement to be extension as shown in the picture to the right.

You are going to be asked to conduct a subjective test to determine whether or not you have a disc derangement and which movement is corrective. Once again spinal extension movement will more than likely be the corrective movement that you will utilize to help your back pain. Researchers measuring the pressures inside the disc have reported that it seems to favor spinal extension to improve symptoms in the spine. [4] As we have discussed previously, backward bending of the spine causes a forward movement of the nucleus within the disc. The most common location for the nucleus to become entrapped is in the posterior portion of the disc. Therefore, if one is going to reduce this entrapment you will want to bend the spine backwards or in "extension" in order to encourage the nucleus to move forward out of the entrapped region in the back of the disc. If one has the misfortune to have one of these episodes, they will be the first to recognize that if they are in a standing position and try to backward bend they experience immediate pain. This is because when the spine is loaded in full weight bearing, the motion tends to pinch the entrapped nuclear fragment causing pressure on the annulus. In the standing position the nuclear fragment may not be able to shift back into a more centrally located position within the disc. Therefore, the patient suffering from such an episode must first lie down in a face down position and unload the disc so that there is less compressive forces on the disc and the entrapped nucleus. Once the patient is in a face down they need to put their hands underneath the chest as shown in the picture to the right.

The patient will then slowly and carefully press up with their arms and simultaneously relax the muscles of the back and buttock. Note the position of spinal extension seen in the picture above. Sometimes a patient may experience increased pain on the first or second extension movements when doing this maneuver. However, it is important for you to do eight to ten repetitions. More than likely you will begin to notice that it becomes easier to do this movement after 3-4 repetitions and the pain should then begin to subside. We generally teach the patient to perform ten of these extension movements in a lying position. IMPORTANT NOTE! If during that process of doing the spinal extension you experience increased pain radiating down your leg then you should stop the movement and contact me because this is not a corrective movement for you and you probably have a herniated disc that is in a position that puts pressure on your nerve. If you have increased leg pain contact us so we can discuss a different management strategy. To continue, after you have performed 10 of these movements we will ask you to get up and move around to see if your back pain has improved. Remember, you may have increased back pain during the maneuver but you should not have increased leg pain. If the symptoms improve then

this extension movement should be considered therapeutic. We will ask you to then repeat 10 extension movements every few hours until you begin to improve. You can then decrease the frequency of these movements as you improve.



If you have increased **leg pain** this does not mean that spinal extension movements cannot be utilized later but there are some things that we will have to do before reconsidering prescribing this movement in the future. So in review, you will lie in a prone position and perform 10 extension movements as described above. During this process you may experience some increased back pain but you should not experience any pain radiation into your leg when performing extension movement. If you have leg pain you need to stop. If you have back pain you may continue to repeat the exercises for 10 repetitions. Stand up and move about and see if your back pain has improved. If you have increased back pain then the movement is not therapeutic and suggests another syndrome which we can discuss during consultation. If you have leg pain with the movement then once again extension is not therapeutic and we will have to discuss that issue. However, if your back pain improves with spinal extension movement, this suggests that you in fact have an "internal disc derangement" or some other condition that responds to extension and the movement is in fact therapeutic.

If you consistently have pain with the spinal extension movements and you are unable to find a movement pattern that relieves your pain you will need a professional trained individual to help you sort this out. If you experience no change in pain or you experience pain that radiates into your legs with these maneuvers you can try the opposite movement such as a "knees to chest maneuver to flex the spine. Remember, spinal extension movement will more commonly than not be the movement that is corrective. Many patients with acute back pain secondary to the internal disc derangement will also experience a lateral shift antalgic position as seen in the picture to the right.

Many patients that have these entrapment syndromes or derangements will have pain that not only is in the lower back but may also have some leg complaints as well. A rather common phenomenon with these patients is to have them experience an immediate relief in the leg pain following the performance of the movements (usually extension). When an individual experiences relief of leg pain following the performance of this movement, the phenomenon is called "**centralization**". Centralization is therefore when you have relief of pain in the buttock or leg following the repetitive movements described above. When the "centralization" phenomenon occurs with this movement, it happens to be a rather good prognostic sign that your condition will be responsive to manual therapy and specific exercises.[5]

If the patient finds himself in a side-bent position such as previously seen above, one can enhance the therapeutic effect of this movement by adding a little trick to the exercise. In the example above the patient's hips are shifted left and shoulders shifted right. To help more rapidly resolve this episode of pain you lie down in a prone position as described previously. At this time before you begin to do the extension movement you shift the hips into a position of correction. In this case, the individual above will shift his hips to the right and then begin the 10 repetitions extension maneuvers. It would be the opposite correction if your hips were shifted right and your shoulders were shifted left. To figure out the direction of correction you simply have to stand up and look in the mirror.

NOW WHAT?

Now that you have resolved your acute pain episode there are strategies that you can employ to prevent these episodes from reoccurring. The first thing is to recognize that people who have these episodes of back pain often have warning signs before they occur. You are all painstakingly aware of what I am referring to. You can commonly experience a sensation of quivering and

tension in your back before you have an acute episode of pain. It is that sensation that "if I move the wrong way today I am going to be in trouble". That sensation is simply caused by a portion or fragment of the nucleus pushing into the tear in your disc and preparing to slip into an entrapped position. If you feel such impending sensations simply lie down and correct it by performing 10 repeated extensions in a lying position as previously described. Never allow your back to become acute. Stop it before it starts. The more frequent you allow the nuclear material to push into the disc the more easily it becomes later and the more damage to the disc over time. Keep it corrected. Robin McKenzie the physical therapist from New Zealand who has been credited for developing many of these techniques has stated on numerous occasions that individuals that perform regular extension exercises (10 repetitions at a time) can expect to have as much as a 70% reduction in recurrent episodes of back pain in the future.

I recommend my athletes to perform these maneuvers before and after exercise. I also recommend patients who are participating in stooped labor or work that requires forward bending, to perform these maneuvers frequently as well. If one experiences a twinge of pain when performing a lift or a forward bending movement, I recommend to patients that they immediately get on the floor in a face down position and perform these maneuvers to correct the disc which is in its beginning phases of an internal derangement. Preventing the episodes from occurring reduces the frequency of being incapacitated for days to weeks, reduces time off work and functional disability. If you travel on an airplane with a problematic back always sit in the aisle seat. Setting in an aisle seat provides an opportunity for you to get up and walk around every hour or so thereby restoring the lumbar curve and repositioning the internal disc. This allows you to minimize the phenomena of "creep" that we have previously discussed.

And finally, not all patients have pain that arise from an internal disc derangement. This phenomenon represents only one of many causes of back pain. You can perform a simple test of performing 10 repetitions in extension and see if your pain centralizes or improves. It is that simple. There are some patients who will not respond to the end-range loading in extension, flexion, et cetera. These patients have other pain syndromes that will clearly not be corrected by these maneuvers and will require a consultation and evaluation to sort out their particular problem.

In summary, the internal disc derangement is a syndrome that mostly involves an acute flair of pain in the lower back which may or may not radiate into the buttock or leg characterized often by a lateral shifted position. They find it hard to get out of a chair. They usually do not have true sciatica but rather have a referred leg pain that immediately gets better when you begin to repetitively move in the direction of correction. Sometimes the patient may have no back pain at all between episodes. Patients with chronic low back pain may also experience these "derangement" episodes associated with the antalgic posture in addition to their ongoing daily chronic pain. For example one may have a chronic dull ache in the back they deal with on a daily basis and then have periodically one of these more acute episodes where they can become incapacitated for several days. When they recover they typically go back to experiencing their original daily dull back ache. When they experience the acute pain caused by derangement their pain is often responsive to these movements we have described. Once recovered from the more acute episode of pain and then return back to their baseline pain they may or may not respond any further to the exercise corrective movement. We can help sort out the cause of the daily pain. There are countless individuals with chronic back pain and recurrent episodes of back pain that may in fact have their source of pain from an annular tear allowing intermittent episodes of internal disc derangement. Once empowered many of these individuals can now become independent with his basic information.

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