

[Got Disc?: A Structural and Functional Perspective on Lumbar Disc Injury Diagnosis and Management - Part 1 of 3](#)

Part 1: <https://www.myrehabexercise.com/blog/archives/947>

Part 2: <https://www.myrehabexercise.com/blog/archives/977>

Part 3: <https://www.myrehabexercise.com/blog/archives/998>

By [Dr. Phillip Snell](#) on May 16, 2012

Can you recognize a disc patient when they walk into your office? The reason I ask is because a sizable number of the chiro students that come through my office find it difficult. The MDs that I see in the office don't seem to know it when they see it...or even when they have it! It was also enlightening a year ago while working with **Dr. Craig Liebenson** to see the DC/PT crowd in the 80+ audience struggle with a disc presentation.

I've wondered about **why this seems to be obtuse to many clinicians** and I think that it is ironically due at least in part, to the way we ingest the literature regarding back pain. An artifact of the RCTs on back pain is that **clinicians are trained to diagnose** disc injury only in the presence of frank **neurological signs**. After all MRIs frequently demonstrate disc pathology in the asymptomatic population and that's the only way we can be sure the disc is injured, right? Recently, one of the world's best known, and most published spine researchers was rumored to have said (paraphrasing) "Randomized Controlled Trials (**RCTs**) on back pain should be banned because they're **so f@#\$ed up**". What on earth did this researcher mean? RCTs are the gold standard of evidence-based practice! In the post-modern, evidence-based world, shouldn't we be on bended knee to the "evidence"? As a clinician who has taken part in some of those major clinical trials I would say yes...but...

Let's review the definition of evidence based practice as defined by **Joel Sackett**. It is defined as practice based on the following 3 components:

1. **The best available current scientific evidence.**
2. **The clinical expertise of the provider.**
3. **Patient choice in their care.**

Here is a quote from Sackett that I think is germane to this blogpost and speaks directly to the 3rd point above and to the insecurities of many who are afraid of EBP:

"Without clinical expertise, practice risks becoming tyrannised by evidence, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient."

RCTs are limited by the questions they ask and by the populations they ask them of. For instance, some cynically note that **specific exercise has not been shown to be beneficial for back pain**. The problem is that historically, the cohort in LBP studies has mostly been **heterogeneous** and doesn't account for either what type of exercise is prescribed, or what type of subgroup of back pain is receiving the prescription. **Jeff Hebert** et al, described these subgroups nicely along with effective treatment modalities for the subgroups in this paper.



I feel another misinterpretation of the literature is regarding the diagnosis of **disc injury** and radicular presentation (**sciatica**). Many clinicians are **trained to only make the diagnosis of disc injury if neurological symptoms are present** (numbness, tingling, pain, motor weakness in a dermatomal distribution). It used to be that we'd rely on MRI to make the diagnosis but now know that many asymptomatic people have disc pathology on MRI. However, a functional approach takes account for a continuum of an injury. I feel that only calling a disc injury a disc injury when one has neurological signs and symptoms is like **ignoring the smell of smoke before the fire over takes you**. I also feel that failure to identify disc injury prior to neurological deficit has a major effect on the public health and on cost of health care. Reflecting back to point 2 above, the clinical expertise of the provider, I'd like to take an opportunity to describe how I address disc patients now after treating them daily in clinical practice for 10 years.

So how do we detect a disc injury before it causes neurological signs? By assimilating multiple clues from the patient's history, physical exam and neuro exam as well as any imaging findings.

History

Family history is very important here as **Videman** and **Battie's** research suggests that a genetic component is at play here, and seems to involve some polymorphisms that result in weaker collagen formation and subsequent disc degeneration (may account for 30-70%!). Also important are the activities of daily living that worsen pain. The hallmarks that I've seen are:

- Pain in transition for sitting to standing
- Pain when rolling over in bed
- Pain getting in and out of cars
- Pain putting on shoes/socks

This video shows a quick correction of these movement patterns so that a disc patient can quickly be taught how to stop hurting themselves. It is part of the free educational video area of FixYourOwnBack.com.

Examination

In the functional rehab world, it is currently fashionable to poo-poo structural issues in diagnosis and management of patients. My opinion is that this represents an adolescent trend in healthcare. We have errantly over-relied on structural cause for pain and dysfunction for far too long. While the research of folks like Ron Melzack, Lorrimer Moseley and David Butler has rightly brought our attention to the 'Neuromatrix of Pain', I fear that we may be throwing the baby out with the bath as we rush to disregard structural pathology. In an interview I did with Michael Adams, he had the following quote re: research on disc injury:

“Most people producing the research concerning back pain don't talk about disk injury. It's almost a shock to find someone take a breath and actually talk about disc injury.”

To bring the discussion back to the exam of the back pain patient, the current evidence suggests a **cluster of orthopedic tests is best** to help identify lumbar disc injury and whether or not that disc injury compromises a nerve root. Below is a video I did putting these 2 tests together in the way that I perform them in clinic for expediency and accuracy. Additionally, I add a **functional test** for lumbar extension borrowed from the **McKenzie** folks to help identify quickly how to treat the patient both in the clinic and with home exercise.

Quick overview of the 3 tests :

- **Slump tells you it's a mechanically compromised disc**
- **SLR tells you if the compromised disc is affecting a nerve root**
- **McKenzie prone press up (Sphinx in yoga) shows the way for treatment**

In the upcoming blog post, I'll lay out a functional approach to disc injury management that highlights inclusion of functional tests and exercises below:

- **Multisegmental movement offers clues but poorly tolerated in disc pt**
- **McGill's quad sit back shows the hinge**
- **Squat/rise shows contributing global movement pattern**
- **Hip flexor endurance test**
- **Leg raise per FMS**

[Still Got Disc?: Functional and Structural Diagnosis and Management of Lumbar Disc Injury - Part 2 of 3](#)

By Dr. Phillip Snell on May 18, 2012

Part 1 of this multi-part posting on lumbar disc injury diagnosis and management discussed identification of the structural issues associated with the injury. Next post we'll look at some of the finesse points that trainers and clinicians can address to improve long term function in the lumbar spine. Today we'll look at the functional aspects. How do we see a disc injury before it manifests as a fully blown sciatica/radiculopathy event or,...

What are the functional clues to impending disc injury?

Lab studies show that endrange loading of the lumbar discs into **flexion** in the presence of **compression** is the **quickest way** to cause a **disc to herniate** in the low back. More often than not in my experience, this represents the end result of long term **habitual lumbar hinging**, until the fateful day when the patient bent forward to pick up _____ (fill in the blank) and felt the **searing pain in the butt** and leg. Single injury events do occur, usually as a **slip and fall onto the butt** or as a poorly executed heavy lift. I can't tell you how many initial onset histories in guys start with, "**My first back injury occurred in high school in the weight room after football practice when me and 2 friends (always 2 friends, and poor grammar) decided to see who could back squat the most weight.**" Often, they remember a 'pop', and back pain, with some sciatica later. Some researchers have said they can hear that 'pop' in the lab as the **endplate fractures** when they load the motion segments to failure in flexion/compression in pig spines. The research of spine biomechanist, Michael Adams, PhD suggests that that endplate failure is frequently the cause of the altered motion in the vertebral segment over time that results in disc degeneration.

If this patient walks into your clinic, studio or gym, that lumbar **hinge is what you're looking for**. If they are acute with radicular symptoms and you try a multisegmental flexion assessment per SFMA, you're a cruel bastard. The seated slump test from the previous post, and the quadruped sit back assessment as in the photos below from Stu McGill's Low Back Disorders will yield your lumbar hinge under **less provocative loading**.



Start in quadruped



Look for the hinge as they sit back toward the heels.

Fix that hinge by quickly training them to **hip hinge** and **box squat** so that they don't hurt getting up and down from the chair to the exam table. Video tutorials for these are available to subscribers of MyRehabExercise.com to send to their patients or clients. **If you don't feel comfortable in your clinic setting or your bodywork studio confidently instructing your patients or clients** how to do this, I've uploaded these as free material on the FixYourOwnBack.com site. Use that as a **resource for your patients or clients** to learn more about their disc injury.

If you're a trainer and your client has this history, **put down your cell phone** and stop texting while your client is squatting, rowing, deadlifting, etc and make sure that they aren't hinging in the lumbar spine while performing those movements. If you're doing Boot Camp types of movements like **Burpees, Mountain Climbers** and **Squat Tosses** with medicine balls, make sure they don't hinge with these movements. (I think Boot Camp exercise vigilance might require a separate post now that I think of it). Trainers can help buttress the lumbar spine during squatting by cueing the client to use the lats by **'bending the bar'** and cueing the glutes by **pushing their knees in** and having the client **resist strongly by pushing the knees out**. If this info is new to you, then you need Stu McGill's other book, Ultimate Back Fitness and Performance. Seriously...go now and get it...we'll wait until you get back!

The typical disc presentation is **flexion-intolerant**, but many of these folks also complain that **extension hurts too** when you stand them up and ask them to bend backwards. This is important to know because you need to

repeat that extension **in the prone position**. You also need to repeat it several times and ask if the **repetitions are less painful**.

If they are, you're on the right track and need to continue the extensions with **McKenzie protocols**. Does that mean you're **done with the rehab? NO!**

The following quotes are from member feedback at **FixYourOwnBack.com** in the **Discussion Forum**:

"I now understand why 3 months of McKenzie exercises (post position) 8x10 reps a day prescribed by my last PT caused new pain and symptoms."

"I have been taught to do the Dead Bug by four physical therapists over the past three and a half years. Doing it the way you explained in your video is a completely different experience and makes it a completely different exercise. Thank you for the in-depth explanation."

I'll also share a recent patient presentation too: **29 y.o. female** 2nd year med student and former **Division 1 soccer player** presented with low back and leg pain **3 weeks after discharge from PT** where she received McKenzie (MDT) therapy. Once her pain improved, she was discharged to normal ADLs. Her first rec league soccer match ended early with **raging leg pain** and weakness after a long cross field kick.

I'm a **huge fan of MDT** and use it daily in my own practice, and that approach did not fail with any of these cases. It did **fall short of rehabilitating** the injuries of these patients. To paraphrase the common question in all of these individuals:

Is There Life After McKenzie?

Full disclosure, **I am not MDT certified** but learned this approach in my DC training, through reading the literature concerning it and I employ it daily with my cervical and lumbar disc patients. The way I use MDT and frame it to my patients is as a **first aid kit**. I know of nothing else that allows a lumbar disc patient quicker **self help pain relief** for disc pain and sciatica. To my mind though, it **only gets the patient to Square 1** of the rehab process.

Once the person is out of pain, that's when the fun starts! I break out **McGill's** rehab protocols, **Janda's** Movement Pattern Assessments, **DNS** assessment, **SFMA** algorithms, **Liebenson's** Mag 7, etc and customize an exercise program for them that borrows from all of these schools of thought. Once your toolbox is deep and you're familiar with these methods they blend wonderfully for the lumbar disc patient. Despite all of these customizations though, **probably 90% of these lumbar disc patients have a very similar take home plan**.

1. **Use McKenzie prone press up to control pain**
2. **Correct transitional movement flaws and posture faults to stop 'picking the scab'**
3. **Stabilize the lumbar spine by building endurance in sagittal and frontal planes/incorporating proper breathing stereotype**
4. **Correct mobility deficits that likely exist in the T-spine and hips, possibly ankle**
5. **Build strength**
6. **Build agility**
7. **Build power**
8. **Address sport specific issues pertaining to the lumbar disc**

Most of my patient base might get up to some of level 5-7, but mostly **need help from a trainer or PT** in a gym environment to really get into the deeper levels well because my office is more set up to manage pain than

performance. The similarity between most of these lumbar disc patients means that much of their **treatment could be standardized**, in my opinion, to help more people. Which brings us to another question:

Does Everyone Need An Individual Assessment?

Wouldn't that be nice? While **I would love to see everyone receive an excellent functional assessment**, but so many folks are suffering from **lumbar disc injury** and it is responsible for such a **drain on public health** that I think we need to address this from a public health perspective. We **need low cost ways** to get most of the people suffering from disc injury **educated** about what not to do, what they should do more of, and **how to incorporate exercise** into their self treatment **without hurting** themselves. Once folks get feeling better, they will need guidance and excellent exercise instruction. Are you qualified? If not, why not? And that leads us to another important question:

What Will You Do In Your Next Career When Your Patients Find Out That They Feel Better After Working Out Than After Leaving Your Office?

Those of you who are **savvy** to Functional Rehab and who are members of **MyRehabExercise.com**, know that all of those approaches above are already available to you on that website to prescribe those tutorials by sending your patients an **email link to their customized prescription**. However, what if you're a **bodyworker, or massage therapist** and you don't feel comfortable taking your relaxed, **naked patients** through rehab exercise instruction after a massage? I just released another site to help those folks distinguish your services by including exercise. **Refer your clients and patients to FixYourOwnBack.com** where they can get **free education** and for much less than they would pay for an office call, they can **get the exercise plan above** laid out for them as **video tutorials**. Next post, I'll cover deeper functional approaches to managing the lumbar disc patient by **decoupling the hip movement from spine movement**, and improving mobility in key areas. Cheers!

[Got Disc? Put Your Hips Into It! - Part 3 of 3](#)

By Dr. Phillip Snell on May 28, 2012

This is the **third installment** of our series on the 'care and feeding' of the **injured lumbar disc**. In Part 1 we discussed the structural pathology (the broken stuff) and in Part 2 we started a discussion of the functional pathology (why stuff broke). Today, we'll continue the functional discussion assuming you've done some pre-reading or have an understanding of the Joint By Joint Approach. If you don't, follow the link and brush up. Also, these approaches and the exercises associated with each stage of the rehab process are represented in the [library of detailed functional rehab exercise here at MyRehabExercise.com](#). **You can't use them** to help teach your patients and clients **unless you're a member**. Membership is **inexpensive (\$9.99/mo)**, 30 day trial for \$1 and you can **discontinue service anytime**. Follow the links to the right to sign up.

If you don't have an office set up to instruct your clients or patients in rehab exercise, or if you just don't feel comfortable customizing the exercise Rx yet for disc injury, check out FixYourOwnBack.com. There, you can just **refer your patients or clients** with disc injury, disc bulge, herniation, sciatica and for \$9.99/mo they can receive the **self-help education and rehab Rx** that is being discussed in this blog series re: management of the lumbar disc injury.

The Plan—"Plan the work, then work The Plan"

Once we have an injured lumbar disc, **The Plan** (as it's referred to on FixYourOwnBack.com) is as follows:

1. **Stop faulty movements** and postures that "pull the scab off" of the healing disc
2. Learn disc "First Aid" using **McKenzie** methods to assist in healing and control pain
3. Use **McGill's** Big 3 and **DNS** methods to stabilize the lumbar spine
4. Improve **mobility** in the **T-spine** and **hips** to spare the spine
5. Use **FMS-based** corrections to **integrate stability and mobility** achieved in #3 and 4 above into long term sustainable movement patterns
6. **Improve strength** in the muscles necessary to perform #5 above
7. **Improve agility** in those **sustainable movement patterns** to help with resilience when life throws a curve
8. Incorporate **sport specific skills** to help manage disc injury and recurrence

This flow pattern has been put together based on my clinical experience working with disc injuries daily and by studying with the rehab schools of thought mentioned above. Credit for much of the overall flow is from Stu McGill's flow mentioned in his excellent books and DVDs. I have added to that flow pattern as I've added tools from the sources above. Most readers of this blog are already familiar with McGill's Big 3, but perhaps not to DNS. I am waist deep in my training in that school of thought but owe my introduction to the Prague methods to my mentor, Dr. Craig Liebenson.

Craig will be hosting a DNS instructional course in Phoenix in November as well as several other introductory courses in the US in 2012, if you'd like to get started with adding these innovative and effective approaches. Let's segue now to the next area of focus that I often see benefit for with disc patients...mobility limitations in the thoracic spine and hips.

The Stiff Upper Back

Chairs are often the culprits that steal valuable mobility from the t-spine and hips. Prolonged sitting posture often results in slumping, exaggerating the kyphotic curve of the thoracic region. Adaptational shortening of the surrounding muscles and tissues results in **loss of thoracic extension and rotation**. Passive methods can be used to help restore that movement like foam roll and lacrosse ball mobilizations in the gym, or bodywork in the clinic or studio. **Active methods**, in my experience, **take less time** to restore this mobility and tend to **last longer**. Search YouTube and you'll find dozens of exercises that help with this area, but I like the **Modified Sphinx**, **Thoracic Rotation** and **Sidelying Thoracic Extension + Rotation** exercises and they're on the website at MyRehabExercise.com and FixYourOwnBack.com.



Modified Sphinx-MyRehab members can click [here](#) to view the video

The Creaky Hips

Remember, the **Joint by Joint Approach** views problems in the stable joint complex areas to be due to limitations in the mobility of surrounding more mobility-oriented joint complexes. Below the lumbar area are the femoro-acetabular joints...**the hips**...which are **high pay off** areas for long term improvement of disc injury. These big ball and socket joints beg for movement that our chairs slowly suck out of us daily. The 2 planes of movement that are typically lost are extension and abduction, as those muscle groups shorten from lack of frequent length changes. Shortening of the resting length of the hip flexors results in mechanical and neurological side effects.

Mechanical Effect of Shortened Hip Flexors

As the shortened flexors' insertion onto the lesser trochanter persists, the **femur shifts anteriorly** in the acetabulum. When that individual squats deeply, the acetabular **labrum gets munched** and sometimes the repetitive loading of this imbalanced hip into deep flexion can result in **bony changes** now referred to as femoral acetabular impingement (**FAI**). For more info on FAI, check out this link to Craig Liebenson's blog. Learning how to test for this is helpful, as an Xray can point to whether that patient should be in an orthopedist's office. However, all anterior hip pain is NOT FAI, and the condition starts as a soft tissue issue. Catching it early in the progression means you can head off not only a hip replacement years later but also the well-meaning FAI surgery!

Neurological Effects of Shortened Hip Flexors

Charles Scott Sherrington's Law of Reciprocal Innervation won him a Nobel Prize in 1932 for describing the neurological relationships between agonist and antagonist muscle groups. Stated simply, when a muscle contracts, its antagonist on the other side of the joint is reflexively relaxed to allow joint movement to occur. Several decades later, Czech neurologist Vladimir Janda coined a corollary to Sherrington's Law which states that when a muscle's resting length has been shortened, it's antagonist will be reflexively inhibited. Around the hip joint, the tight hip flexors inhibit the large muscles of the buttock...the glute max and the glute med. This condition in the hips has been referred to in Janda circles as part of the **Lower Cross Syndrome**, and years later by Stu McGill as '**gluteal amnesia**'.

What we then see in the clinic is pain in the smaller muscles of the buttock, namely the **gluteus minimus**, **piriformis** and **TFL>ITB**. Pain in these muscles then represents an **overuse syndrome** as the smaller muscles are re-tasked to share the load the glute max/med should be bearing. While manual therapies (massage, myofascial release, Graston, Stecco, foam rolling) are helpful in reducing the pain in these areas, the relief is temporary unless you address the functional causes. **Now that you know this, if you're in the business in your clinic of mining this repeat business for fun and profit, then you're part of the problem.** Either **learn how** to correct the functional imbalances **or refer to** someone who does after you perform the worthy service of helping to manage your patient/client's pain! To improve mobility in the hips, flexor stretches (lunges) are helpful and **Goblet Squats** are the bomb for opening up the medial joint capsule. Many **disc patients** though, **can't manage** the deep squat position of the Goblet without loss of the lumbar lordosis and resultant **stress of the injured disc**. For those folks we have the **Tactical Frog** to help open the hips a bit before progressing to the Goblet.



Tactical Frog-MyRehab members can click to view the video.

Our next step in rehabbing the disc injury then moves to re-training the hip and spine to function well together. In some circles I've heard this referred to as 'de-coupling' the hips from the spine. I see it more as **integrating the stable spine to the moving hip**. We use the **sternal crunch + abdominal breathing pattern** to get the internal spine stabilization system working, then add a high complexity/low load exercise (**Dead Bugs**) on top to groove the pattern. After that I really like the **Leg Lowering progressions from the FMS** corrections to add load. We then borrow a page from Gary Gray and stand the patient up and have them to practice standing hip flexor endurance. The hip flexor endurance test attributed to Shirley Sahrmann was described by Mike Boyle in this paper and the procedure is below.

1. In single leg stance, pull one knee to the chest and release.
2. Observe for failure in ability to maintain >90 degrees of hip flexion for 15 sec.
3. Is there cramping in the TFL?
4. Observe for posterior lean, rounding in the spine or lateral tilt of the pelvis

As the psoas group and the iliacus are the only 2 hip flexors that can flex the hip beyond 90 degrees, the observations above indicate weakness of those muscles if those signs are present. I've found that the test can be effectively used as an exercise by cueing the patient to avoid the above faults and work to increase endurance in the single leg stance from 15-30 seconds. We bring all of the cues together from all of the previous work to get all of the parts working together well...ribs down, be long through the spine, pinch a quarter in the butt cheeks, belly breathe. I also cue them to **place a hand lightly on the lumbar spine to get biofeedback for spine movement and one hand over the lower ribs looking for flare of the ribs**. Your target is to keep the knee over 90 degrees and have NO movement in the lumbar spine.



FixYourOwnBack members can find this as part of Chapter 5-Integrating Stability and Mobility

Once the hips are dialed in, **our disc patient can start having more fun!** Transverse plane movement progressions like rolling>hard rolling>chops/lifts>PaloF presses can begin the journey to strength training and we incorporate those into the program at FixYourOwnBack.com.



Soft Rolling-Lower, From MyRehabExercise video tutorial library



Hard Rolling--from MyRehabExercise video tutorial library



Tall 1/2 Kneeling Chops--from MyRehabExercise video tutorial library



Pallof Presses--from FixYourOwnBack video tutorial library

Since many folks pursue that strength training in a standard “big box” type gym, we take time to instruct them about **specific equipment and exercises to avoid**. Those that have aspirations toward some of the bodyweight “**boot camp**” type programs need **caution** on some of the excellent exercises like **burpees**, **man-makers** and **mountain climbers**. We'll save that info for the next post here at MyRehabExercise.com.

As a reminder, this **progression plan outlined in these posts** is **already laid out** as a self-help membership site at **FixYourOwnBack.com**. **Membership is only \$9.99/month**, less than the co-pay in most insurance plans, and no contract means your patients or clients can quit when they've reached their goals.

Click Here to Get Access to This Disc Injury Rehab Progression at FixYourOwnBack.com

For those **readers already saavy** to these types of functional exercises and who want more control over the exercise Rx, consider membership to MyRehabExercise.com. There you'll find a library of detailed functional rehab exercise tutorial videos you can send to you patients and clients via email to better tailor their progress to your professional assessments. Be well!

For those interested in seeing the **combination of structural and functional approaches** as it applies to disc injury, please visit **FixYourOwnBack.com**. There you will find an organized, self-help exercise program based on the outline modeled here. Arranged in an innovative, interactive chapter book format, users can work at their own pace to address the mobility, stability, integration, strength, agility and power components of complete rehab of the lumbar disc injury.

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