

ELIMINATE PAIN

PREVENT INJURY



BREATHING & **BRACING**

ALEX BROMLEY
EMPIRE BARBELL

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20 years later, he has over 30 Strongman and Powerlifting meets under his belt and has prepped dozens of athletes for competition.

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INTRODUCTION

This book was put together to shed some insight on an important topic to me: longevity. You see, I love lifting, and an important part of that process is the joy that comes from pushing the limits and forcing my body to grow. Many of us have put a lot of miles on our body in the process of pushing those limits, and those miles have likely led to a few break-downs. If too many breakdowns stack up, longevity is no longer an option.

For me, those break-downs have never dissuaded me from pushing on, but there came a point where I realized that something had to change if I wanted to do this for much longer. It turns out that repeated back injuries aren't just bad for your health and well-being.... they are bad for progress.

My first back injury came when I was 16 years old. As most teenagers, I thought I was made out of magic and rubber bands and deadlifted with reckless abandon under the motto "failure is not an option!". I would round and shake and spit and growl to lock out a lift, letting the glory of standing up with a new personal best justify the ugly means of getting it there.

The injury struck me mid-pull on a deadlift in the form of a sudden wet 'POP' and, just like that, I was out of commission for several months.

What specifically went wrong for me was lack of awareness. I never knew how bad I looked during a deadlift until I was old enough to afford a phone with a camera in it (this was back in 2004, before the iPhone and before recording every lift was mandatory). I soon saw how excessive the rounding really was and was shocked that this injury didn't happen earlier. I rehabbed my 16 year old spine (incorrectly, I'm sure), began building back up slowly, and in 6 months time was back at full strength.

New PRs soon began to fall and they were occurring with reasonably

good posture. “I figured it out!”, I thought. “NEVER AGAIN!”. Then... BAM... it happened once more.

With every comeback, I fought to arch my back as hard as I could, vowing to never round a deadlift again. I kept the weights down, and only jumped if I could keep position. Eventually, over the course of years, my upper back stiffened, becoming strong enough to hold position under heavy pulls. My lower back fused into a permanently extended position, eliminating all mobility in the region and creating a pronounced anterior pelvic tilt. I thought this was a good thing! But my deadlift still felt horrible. And I was still getting injured.

Eventually I resigned myself to 'non-deadlifter' status and focused entirely on squatting and pressing. I was done fighting it.

I was still competing, however, and still coaching others. Just by existing in the field, I was slowly being exposed to information and different ways of thinking about how to setup for big lifts. I was picking up bits about increasing mobility, improving motor patterns, and bracing properly; all things that were lost on me in my formative years.

One bit of serendipity landed me at a seminar that Juggernaut Training Systems put on involving Chad Smith, Blaine Sumner, Brandon Lilly, and Sam Byrd. The seminar started with a 'breathing seminar' put on by the Darkside Strength guys, Ryan Brown and Dr. Quinn Hennoch.

In the first 10 minutes, we were on our back with our feet on the walls, red in the face and on the verge of passing out from their bizarre breathing drills.

“What is this voodoo? I'm here for the squats!”.

45 minutes we spent, doing bracing drills, hyperventilating into tensed abs, and discussing the relationship of bad posture and breathing habits to tight muscles and shitty performance. One demonstration

showed how correct bracing can improve the range of motion of a tight hamstring by 20% *immediately*.

These experts... no, these *warlocks*..... had quick, concise, rational answers to every question I had. It had been a long time since I felt so inexperienced inside of a gym. They explained that a rounded back is a shitty position (which I knew), but that overly extended was just as bad (whaaa?). They demonstrated the causes of tight muscles (me), explained what leads to an anterior pelvic tilt (me), and covered the reasons most under perform and eventually get injured (me).

In one session, I learned that everything I had done for the last 10 years was wrong.

I kept learning and paying attention, applying specific cues to my barbell lifts and drilling specific correctional exercises in and out of the gym. I came across guys like Stuart McGill and watched the message of proper back care take hold in the field of competitive lifting.

It's been years since I've had a debilitating injury and I can honestly say I'm stronger than ever. My deadlift setup is now effective and safe because of deliberate changes I've made to it. At the age where lifters typically break down and retire, I'm making progress I have never seen before.

The part of this whole process that makes me the happiest is the fact that I can teach this to others so they get it right the first time. Every person who comes through Empire Barbell gets lectured on proper breathing mechanics. The sound of my voice yelling "Glutes tight...ribs down!!" haunts my trainees when they sleep.

This short book is not to push a single method and it's not a copy and paste job of the websites on page 1 of the Google results on breathing and bracing. This is a compilation of ideas that have changed the way I prepare myself and others for competition.

If you have previous back injuries, these tips will help you. If you are a competitive lifter, these tips will help you. If you have a spine, these tips will help you.

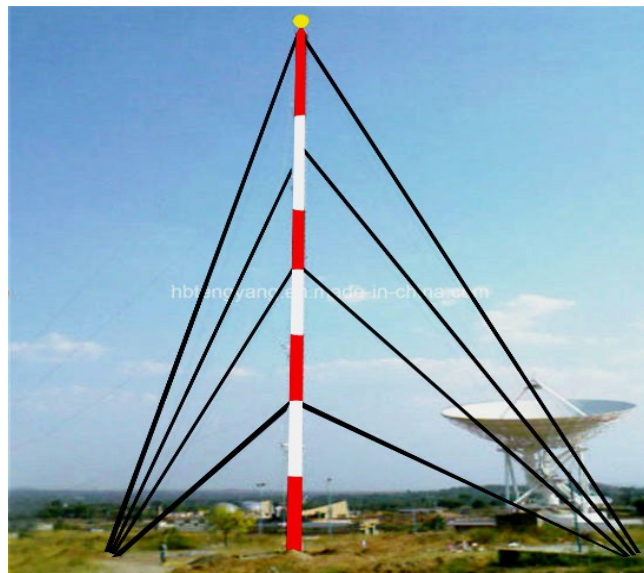


HOW THE SPINE WORKS

The spine is made up of numerous vertebra, small bones stacked on top of each other that allow for a wide range of movement. We can twist, bend, and arch all because of the flexibility the structure of our spine affords. But this comes at a price.

More mobility also means less stability. The fact that the spine is so diverse in its movement capacities is exactly what opens it up to risk. If the vertebra are not properly aligned or braced and the spine is placed under a load, disaster can strike in the form of an injury.

The fact is that the spine actually CAN handle an incredible amount of force before it becomes susceptible to damage, but the load has to be handled with proper alignment and firm bracing.



Think of the spine as a radio tower, standing hundreds of feet in the air. The fact that it remains upright and rigid is due to the cables that pull with equal and opposite force to brace the tower. The obliques pull with equal and opposite force. The spinal erectors and the abdominals pull with equal and opposite force.

The pain and dysfunction that occurs in the lower back is rarely the result of a 'weak back', as many initially believe. Rather, it is usually the byproduct of an inequality in tension between two opposing structures.

Consider for a moment that your abdominals and spinal erectors are tension cables, keeping the spine upright and rigid by pulling against each other. What happens when one is substantially weaker than the other? If you are imagining your spine being pulled to one side like the leaning tower of Pisa, you would be right.

Rather than a 'weak back', the most common issues in lifters that lead to back pain and injuries are the poor bracing habits that lead to non-optimal distribution of the load.

To brace effectively, every structure must 1.) be strong enough to carry it's share of the load and 2.) be coordinated with the other structures so that movement happens in the right order. These two issues can be tricky to diagnose, since it is difficult to differentiate between a muscle being 'weak' and a muscle group simply not coordinating properly.

PATTERNING EXPLAINED

The concept of 'patterning' can throw some for a loop. It's really a substitute term for coordination, just with the added consideration of proper recruitment.

Consider an orchestra as your body and each instrument section as your muscles. If the woodwind section is free-styling instead of following the conductor, there will be serious consequences to how the music sounds. That's poor coordination.

Now, imagine instead that these flute players and oboists are merely asleep and need to be woken up to join the rest of the band. That's

poor recruitment.

Imagine further that they are wide awake and are playing in concert with the rest of the symphony, but they just aren't very talented. That's poor strength.

'Patterning' is how we describe the whole ordeal.

EXAMPLES OF POOR PATTERNING

Having your abdominals relax on the descent of a squat, causing a loss of tension in the midsection and hips (poor recruitment)

Pushing the belly out while taking a large breath and squeezing before a big lift, i.e. belt breathing (poor coordination)

Failing a lift without any deviation in position (poor strength)

Let's break down how everything in your spine SHOULD pattern.

The muscles of the trunk should work to MAINTAIN position.

A common mistake is to work muscles of the midsection through movement, but the muscles of they actually exist to *limit* movement, not create it. This is the definition of bracing.

As the muscles of the upper back, abdominals, obliques, and erectors all coordinate to establish good posture (a neutral spine), **they lock down, limiting movement and creating stability** that allows distal structures (legs and arms) to move more efficiently.

I first heard the finger analogy from Dr. Stuart McGill, but have seen it repeated several times: for the finger to move very quickly, the wrist must be braced, less the whole arm wiggle around chaotically. The same is true for other limbs: *proximal movement requires distal stability*. To run, jump, punch, squat, and deadlift, the midsection must

be braced and stable so the limbs can move effectively.

Once posture is set and stability created, the joints at the hip and knee should move independently of the spine. One of the biggest signs of dysfunction that those with sedentary lifestyles and poor movement habits demonstrate is the inability to separate the movement of the hip and that of the spine.

Ask someone who has spent their entire professional career sitting in a chair to bend over and pick up a pencil. Watch closely to see if they can maintain good posture or if they round down to the ground and uncoil their spine on the way up like a cobra out of a snake charmer's basket.

Sometimes this issue is caused by poor coordination: bad habits developed over time that mix up which things should move when and in which order.

Other times, it's caused by something being tight; for instance if the hamstrings are extraordinarily tight from being shortened all day at a desk job, bending over or squatting down may require deviations in normal movement patterns to complete the task.

Other times still, it's caused by something being weak or not recruited properly; for instance, if the abdominals physically cannot maintain enough tension to brace the midsection, the erectors will become overactive, often leading to back pain and an anterior pelvic tilt.

Most often, it's some mix of all 3.

For this reason, training the body to brace and move effectively should actually cover all three bases, and do so in a specific order.

The primary mistake made when trying to improve abdominal bracing is to focus on strengthening or stretching individual muscles first. We have already covered the importance of proper patterning: *it doesn't*

matter one bit how strong or mobile a muscle is if it's not being used at the right time, or at all.

Building up correct patterning habits, that is, learning how to recruit and coordinate the muscles that hold you up and move you, should always take priority. Only once you understand how to setup and move correctly can you gain any benefit from further stretching/strengthening of problem areas.

1. Improve Recruitment
2. Increase Coordination
3. Increase Endurance and Strength

In that order.

Don't be confused. Many modes of training may work all 3 traits simultaneously (yoga, for instance). The primary point here is to not put the cart before the horse by hammering things like weighted sit-ups or exotic mobility drills before learning to even breathe properly under a load.

INCORRECT PATTERNS (WHAT MOST LIFTERS DO)

By far, the most commonly repeated strategy in the lifting world with regards to staying stable under a big load is to over-rely on a deep breath out against the belt and the Valsalva maneuver. The Valsalva maneuver involves forcing air out against a closed airway, like your pinched nose when trying to clear pressure out of your ears or the back of your throat when bearing down under a load.

Typical fat-powerlifter belt bracing involves the following steps: a giant breath is taken, the abs shoved out in front into the belt, the muscles tensed around that big pocket of air, jacking up the pressure in your abdominal cavity as well as in your head. It's a quick and dirty way to increase intra abdominal pressure, but it sucks for a lot of different reasons.

Here's the top 8.

1. It stretches the abdominal muscles. Taking a large breath and pushing the abs out to the front elongates the abdominal muscles. Strength training 101 says “a lengthened muscle is a weakened muscle”.

2: It does nothing to improve proprioception of the abdominal muscles. Your mind bridges to the muscles it controls when they are contracted. Forcing the abdominals into a stretched position forces the movement to hinge on the size of the breath instead of actual control over the abdominal muscles. BREATHING IS NOT BRACING! The abdominal muscles are what brace the spine and you have to be aware of them for them to do their job.

3: It biases the stability towards the front of the abdomen instead of spreading it circumferentially around the midsection.

“Circumferentially” is fancy speak for 'around'. Stability in the torso

should exist in all directions, not just out to the front. Lifting belts pick up the slack here, distributing that frontwards pressure around the rest of the midsection. Any lifter who is used to shoving the abs out into their belt will see the difference when the belt is taken away. To get this effect without a belt, a different approach is required.

4: It does nothing to stabilize the upper back. Diaphragmatic breathing refers to deep breathing where the diaphragm drops into the belly. When all of that pressure is directed down and to the front of the abdomen, the lungs don't completely fill and the ribs don't fully expand, compromising the stability of the upper back. When the abdominals are instead tensed first, restricting the diaphragm, that pressure is redirected back into the rib cage, creating immense stability through the chest and upper back.

5: It's damn near impossible to do for high reps. At the start of a squat, take a very, very large breath, push your abs out, and complete a repetition. No do it again and again for a set of 15. My guess is you passed out at 10. Learning to utilize the abdominals properly allows you to breathe as you move while maintaining stability in the spine. This is something strongmen know from having to breathe while carrying 1000lb yokes.

6: It coaxes the spine into extension, destabilizing it while lengthening the glutes and hamstrings. When a big breath is taken and the abs pushed out, the tendency is to slip into an anterior pelvic tilt (think lower back over-arched). This negatively affects so many things; faces the pelvic floor and diaphragm away from each other (don't dent the can!), puts shearing forces on the lumbar spine, and pre-stretches the glutes and hamstrings, putting them in a weaker position at the start of the lift.

7: It might pass on a squat, but is horrible for setting up in a deadlift. Super heavy weight equipped squatters have been getting away with the Valsalva for years. In equipped lifting, increasing pressure by filling up the triple ply squat suit is about as important as

anything else. But how does that work out for a deadlift, when you have to start at the bottom? Some take a breath while standing, then dive bomb to the bar in hopes of getting into position before the lights go out. With straps, high reps, or a setup that requires more than 3 seconds of attention, that isn't an option. Many world class squatters vocalize not being able to recreate the tension they can get during a squat in a deadlift (Sam Byrd told this to me in person). Much of this is likely due to their bracing mechanics.

8: Without a belt, it fails completely. The belt takes the pressure from the abdominals being shoved out in front and redirects it around the rest of the midsection. It's easy to feel your first time doing it; take a breath, push out into the belt, and instantly feel tighter through your lower back. Once the belt comes off, this redirection of pressure stops and your lower back again ends up exposed. Rediscovering that stability without a belt means completely retooling the way you brace.

You get the idea. Using correct breathing mechanics while paying attention to posture fixes every single problem just listed. We're not just talking about better performance; fixing these issues has the added benefit of more efficient oxygen uptake and better day-to-day habits for a healthy spine down the road.

Proper Breathing Mechanics

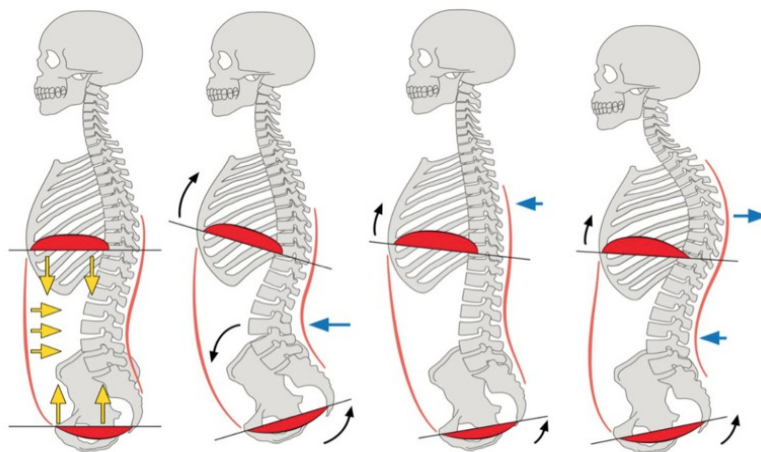
Aside from the misguided big-belly belt-breathing style of bracing that competitive lifters employ, most breathe incorrectly throughout the day, taking soft, shallow breaths and never reaching full exhalation.

Thousands of lazy breaths per day eventually leads to poor mechanics that impact performance in other arenas, including weight lifting. The abs don't get trained to move correctly and the ribs never move to accommodate truly full lungs. Posture then suffers, which destroys the foundation that proper bracing is built off of. Long story short, if you don't breathe correctly, you will never brace correctly.

Proper breathing involves

- 1.) Good posture
- 2.) Recruitment of the abdominals
- 3.) Breathing into the braced abdominals
- 4.) Full inhalation through the stomach and up into the ribs
- 5.) Full exhalation, engaging the abdominals to force air out

Since good posture is the cornerstone of everything else, let's begin with that.

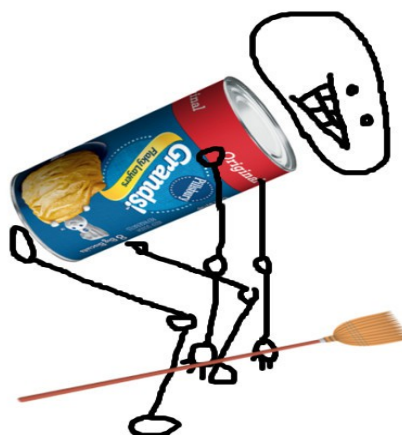


*Imagine the area in red represents a stool. Which one do you trust to support your weight?
(image from EliteFTS.com)*

Good posture requires the diaphragm to be stacked directly over the pelvic floor (figure #1).

This requires neutral spinal alignment and a neutral hip position. Many lifters, through years of poor patterning, develop an anterior pelvic tilt (all images except the first). This is where the hips tilt back, often with the ribs flaring up, creating excessive arching in the lumbar spine. Along with stretching the abdominals and lengthening the glutes and hamstrings (putting all 3 in a weakened position), it also faces the diaphragm and pelvic floor away from each other, creating the shape of a dented can.

Think of the torso as a tube of Pillsbury biscuits. You want the container upright and intact at ALL TIMES, not flexed or dented.



Once we have a concept of proper posture, we can start to familiarize ourselves with the muscles used and exactly how they should engage.

I first came across these breathing techniques in a seminar by the Darkside Strength guys (Ryan Brown and Dr. Quinn Hennoch) at a Juggernaut Seminar a few years back. The simple tasks they had us do were embarrassingly hard and were ultimately what changed how I viewed breathing and bracing.

Let's start with training wheels: the 90/90 position. This position takes the guess work out of posture. When you are on your back with your feet up, your spine is neutral, so you can focus entirely on patterning the abdominals correctly and pacing your breathing.



Think 'ribs down'; this shortens the abdominals, making them stronger, and limits the space in the abdominal cavity, which increases pressure as you inhale.

Pull the abs down and in, tensing them, and breathe in hard and fully against them through the nose. You should feel pressure come in through the lower back, then up into the ribs and upper back as you fully inhale. Once you inhale, you should exhale fully and forcefully through the mouth, contracting the abs as you do (squueeeeee!!) and

fully evacuating the lungs.

I'm serious on this point, breathe ALL THE WAY out. In addition to increasing oxygen uptake efficiency, it will reinforce the relationship of the diaphragm to the pelvic floor. The abs should cramp hard, reminding you how important they are in this process.

One repetition consists of a 5 second breath through the nose into a hard exhale through the mouth, and a set may consist of 5 to 10 repetitions. After several sets, you should be sweating and possibly light headed. *It should be very evident to you how bad you are at breathing.*

Once you understand the order of operations for proper breathing mechanics, you can attempt to reproduce it on your own two feet.

When standing, remember to reset your posture EVERY TIME. The goal is to be upright with a neutral spine and neutral hips. The glutes play a big role here; those with an anterior pelvic tilt can squeeze them to tuck the hips under, bringing the lumbar spine back to neutral.

Avoid the typical arched back with shifted hips, soft belly, and flared ribs. Remember your biscuits! *Don't dent the can!*

Initiate proper posture by flexing the quads first to lock the knees, glutes second to set hips, then pulling in the abdominals to bring the ribs down. You should feel tight, top to bottom. This is exactly what I do at the start of a squat.

With your now-neutral spine and hips and the abdominals drawn in, take a breath into the tensed abs, and push DOWN, locking in the obliques and lats and creating complete circumferential tension. *Imagine your torso is a briefcase and you just latched your ribs into your hips.*

Quads. Glutes. Abs.

Quads. Glutes. Abs.

Repeat it until you hear it in your sleep.

The goal is to optimize stability, which is where posture comes in, and direct that stability in ALL directions, rather than the one direction that it goes when the belly is blindly pushed out.

Tensing the abs first and then breathing creates pressure that can be felt out through the lower back and sides, creating the sensation of an internal 'lifting belt'.

Locking the obliques and lats down into the hips unifies the torso into a single dense cylinder, which will make it easier to conceptualize hinging and squatting without moving at the spine.

Proper breathing is diaphragmatic, meaning the diaphragm drops, as it does when you breathe into your stomach. The problem is that the LUNGS are where the air should be going. Unless the abdominals provide resistance against the dropping diaphragm, air will not sufficiently move back into the chest and upper back.

Remember the crappy belt breathing we talked about earlier? Walk through it right now. Take a deeeeep breath, push your abs out, and squeeze down around it. Feel the pressure? Take note of where the stability is. In your stomach? Your back? Your head? What is your posture doing?

Now, take a few breaths and try it how we just went over: pull your abs in, bring your ribs down, and squeeze your abs FIRST. Once they are tense, slowly start to take a deep, diaphragmatic breath into the tensed abs. Do you feel the tension moving in and around your torso as you inhale? Do you feel the pressure into your lower back, then up into your chest and upper back? Which feels more complete between the two breathing styles? It should be obvious.

This method is how we improve the function of our midsection with respect to breathing and increase tension through the entire system. This allows a fuller breath into the lungs, supporting the chest and upper back. This allows the maintenance of proper posture, instead of tilting the hips, arching the back, or flaring the ribs. This allows the abdominals to function in a SHORTENED position, where they are strong, rather than a lengthened, distended, weakened position as they are in when the big breath comes first.

In addition to better performance, this method also solves some logistical problems created by excessive belly breathing. Setting up at the bottom of a clean or deadlift becomes much easier. Lifters and athletes who gain a reasonable amount of endurance with these techniques can stay braced while breathing and moving under a load. Imagine a fighter trying to take a huge breath and bare down every time they had to make an explosive maneuver, or a bodybuilder performing squats or leg presses for sets of 20 with the same technique. They simply would not work.

Practicing these movements until they become intuitive and automatic is the first step.

The next step is to increase endurance so these cues can be carried out as long as needed without fatigue.

MCGILL BIG 3

Dr. Stuart McGill, author of “Back Mechanic” and “the Gift of Injury”, has received mass acclaim over the last few years for reinventing the way lifters (and the public at large) view abdominal strength and spine health.

The McGill Big 3 are his go-to exercises for preserving back health while practicing and conditioning proper bracing. These three movements are great tools for learning to isolate the abs (and subsequently the spine as a whole) from the distal movement at the limbs. Once proper breathing and posture mechanics are established, the next step is to build endurance in the bracing muscles so that proper position can be maintained for longer periods of time.

Historically, dynamic exercises prescribed to strengthen the core moved through a stretch-shortening cycle similar to other bodybuilding movements: sit ups, crunches, leg raises, twists, etc.

But there's a few problems:

- 1.) As we've covered, this isn't the way the muscles of the core work when they are being used.
- 2.) The flexion and extension that occurs during these movements can exaggerate previous injuries or cause new ones.
- 3.) The proper braced position doesn't last very long in new trainees, so they quickly end up losing position and compensating with other muscles.
- 4.) All of this reinforces bad habits and interferes with correct movement patterns.

McGill has a main premise, which I agree with whole-heartedly: *muscles surrounding the spine exist to limit motion, not create it.*

If you have come across any other websites reviewing McGill's work, you have seen this stated before: distal motion requires proximal stability. Distal means far away, proximal means close. McGill uses the finger analogy; if your finger wants to wag quickly (distal motion), the wrist must stay rigid to accommodate (proximal stability).

Your body is constantly doing this and it's something you take for granted. When you walk, run, jump, throw a punch, or lift weights, movement in the limbs is being facilitated by stability in the joints that support them.

Now consider the heavy movements: squat, deadlift, clean, etc. How efficiently do you think your legs will move against a barbell if there is no stability in the spine that transfers force from one to the other? How *safe* do you think you will be?

To increase performance and prevent injury, the spine should be properly aligned and stiff throughout with movement isolated to the extremities.

Teaching this requires learning how to brace in the right order and then increasing your ability to hold that position for longer periods. The breathing drills we previously went over are a good start, but we can use accessory exercises like these to practice these habits and increase our skill with them.

The 'Big 3' are a group of exercises that work the supportive muscles of the spine isometrically, the way that they will be used in the real world.

Their progression emphasizes endurance as a priority before strength. Most cannot brace correctly for very long, so it's important to lengthen the time you can maintain a proper position before attempting to load it.

Most importantly to those rehabbing an injury, they avoid any

flexion/extension that can aggravate or worsen pre-existing issues. The big power of the Big 3 is that they can be used to treat current injuries. After something in the back goes, whether it's tissue damage or a bulging disc, the worse thing you can do is nothing. However, the inflammation and tightness that results can take a lot of options off the table. These movements are a great way to stay mobile and practice better positioning without contributing to the injury.

CURL UP:

One leg up, hand under hips, and with a neutral spine.

Lift head up (with abs, not neck), hold for 10 seconds breathing into tensed abdominals.

Relax and repeat, after several reps, switch legs.



McGill's recommendation is a descending pyramid to take into account the fact that patterning worsens with fatigue.

Example: 3 working sets might be done with 10 second holds for 7 reps each leg, then 5 reps, then 3 reps. The next workout might go 8/6/4 or add an extra set.

The point is not to blindly carry out a task past the point of fatigue, but to maintain a specific position for as long as possible. Keep a rigid technical ceiling; do not push past the point where positioning is compromised.

Take note of how difficult something so seemingly simple is. This highlights how poorly your body is at maintaining tensed abdominals, and how much worse something as common as breathing can make it. You **SHOULD** be able to breathe through tensed abdominals without shaking. If you can't, how do you expect to deadlift 500lbs safely?

SIDE PLANK:

Top foot in front, hand on opposite shoulder, and body in a straight line. (Begin on knees if too difficult)





It should be obvious how much this movement taxes the obliques. They are essential in bracing during heavy lifting and key for maintaining position while resisting an external force (as in anti-rotation). If the obliques aren't over looked, they are trained outright incorrectly. Endless side bends and twists will fatigue the obliques without ever teaching them how to be strong in the way they are actually used.

Traditional planks are going by the wayside, since most train them for arbitrary time durations and fixate on the number, allowing the abs to soften and the back to arch as long as the arms can still hold them up. The side plank is harder to cheat and for that reason can be pushed farther into the realm of fatigue.

Several sets can be done for 10 to 20 seconds, based on difficulty, and time can be added each session.

BIRD DOG:

Start on all fours, with a neutral spine and hip position, straighten one arm and the opposite leg, and have partner correct spine or hip position if it deviates.

Reps and sets are similar to the curl-up. 10 second holds in a descending pyramid.



This movement is important because it teaches the limbs to move while the midsection is braced, which is the main point of all of this. Proper posture is PARAMOUNT in this; do not allow for posture to deviate to gain more motion in the limbs. Remember, distal movement requires proximal stability. We are concerned with training your ability to stabilize first.

When this becomes too easy, begin to draw circles or squares for a specific rep count on each side and progress with number of reps and total number of sets.

ANTI-MOVEMENTS

Aside from the McGill 3, there are a whole host of movements that can condition the muscles around the spine to brace correctly and do so in varying positions and for longer periods of time. Casually coined 'anti-movements', the common thread between them is that the muscles of the trunk stay braced and work to maintain good posture in the face of an external force that is attempting to break that posture.

If holding one dumbbell to the side creates lateral flexion and you resist that, the exercise is referred to as 'anti-lateral flexion'. If the load causes extension and you resist, 'anti-extension', rotation, 'anti-rotation'. You get the idea.

These exercises test your bracing skills in a wide variety of positions and are a great way to feel the different muscles at play. As movement awareness increases, your ability to hold for longer periods of time should increase as well and the ultimate result will be better lifting mechanics and a healthier spine.

ANTI-ROTATION

'Anti-rotation' describes exercises in which you will be resisting some force that would otherwise cause rotation in your torso, as when you are being turned or twisted to the side. These are comprehensive replacements for movements like Russian Twists or Bicycle Crunches where the torso is actually flexing and twisting.

Removing this flexing and twisting prevents undue stress from being placed on the discs of the vertebra that might aggravate or worsen injury, but the major benefit is that the muscles of the core are being trained *specifically* to do what they do in a squat or deadlift: maintain position while the rest of the body moves under a load.

Palloff Press –

The Palloff press involves holding a band or a cable that is anchored off to your side and pressing it out in front while maintaining posture and keeping your midsection braced. You will notice the further you push the band away from you, the more difficult it is to resist rotation.



Remember, these exercises will prioritize endurance before strength; move slowly and deliberately, giving 5 seconds on the press and 5 seconds on the release. Keep the abdominals tensed and exhale forcefully, squeezing them hard when the lungs are fully cleared.

Variations of the Palloff Press include kneeling, half kneeling, and standing.

Stir the Pot –

This is actually a hybrid movement, involving elements of anti-extension as well as anti-rotation. This is a very unstable movement that works the muscles of the midsection through multiple planes all at once; I don't recommend trying this until you are completely comfortable with the other introductory anti-extension movements.



Take a stability ball and use it to prop yourself up in a plank position. Keep your chest elevated off of the ball, feet together, and lower back completely neutral. You might notice just holding this position without rolling off is a bit tricky. Once you are stable, begin to move your arms in very small circles counter-clockwise, just as if you were stirring something in a pot, then switch directions.

The key here is to have absolute control over what the abdominals are doing. They should be tight, like at the top of a crunch, and you should feel them contract hard with every exhalation. One recommendation was to use 'candle breathing', a method of short, quick breaths in and out as if you were trying to blow out then suck in the flame from a candle. This method reinforces abdominal control in a braced position.

Move slowly and deliberately, giving a couple of seconds on each rotation. Don't work this movement past your ability to maintain a neutral spin; you may have to start with only a few reps per side and progress to more working sets and higher reps over time.

Cable Chop –

Similar to a Palloff Press, the cable chop involves bracing while the arms move diagonally across your body. They can be done with a high to low, low to high, standing, kneeling, or half kneeling, with a band, a cable, or even a free weight. The same rules apply, perfect posture (diaphragm stacked over the pelvic floor with a neutral spine) and aggressive bracing (abs pulled in and tight the entire time).



Despite the name, we aren't actually swinging an axe here; don't move at the hips or spine, instead stay rigid as your arms sweep across your body. With correct positioning and a steady tempo, you won't need a lot of weight to make this one work for you.

Any Horizontal, Unevenly Loaded Movement -

There's endless variations of anti-rotation movements. Aside from the staples, any movement where your torso is horizontal and weight distribution is loaded to one side will achieve a similar effect.

Examples include: bent rows with a single dumbbell, single leg Romanian deadlifts, back extensions with a dumbbell loaded on one shoulder, bench presses with one dumbbell, and any variation of situps with the weight held on one side. Don't let the variety of options stun you; you simply need to pick a few solid choices and work them diligently for several weeks before rotating something else in.

ANTI LATERAL-FLEXION

'Anti lateral-flexion' describes movements where you resist bending to one side. An easy analogy is carrying a suitcase with one hand; the tendency is to be bent to the side by the weight of the suitcase but the muscles of your obliques work hard to resist.

These movements replace monotonous wastes of time like side-bends, again sparing you from unnecessary spinal flexion while conditioning the muscles to work for the tasks they will be used for. These movements are much more easy to implement in your training than the others, granting you the ability to practice posture, bracing, and breathing without a long learning curve.

Suitcase/Waiter/Ipsilateral Carries, Squats, and Deadlifts -

Any movement where you are upright with a load to one side of you (like holding a suitcase) classifies as anti lateral-flexion. Instead of traditional side bends, these movements teach you to hold the braced position for longer periods of time while eliminating any undue movement in the vertebra.



These lopsided movements can involve carries for distance or time, squats and deadlifts for reps or to a tempo, or any other movement where the torso maintains upright as the legs move, like step ups,

lunges, or split squats.

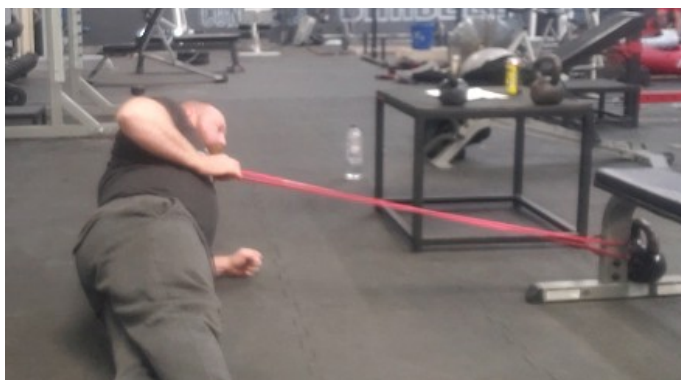
“Suitcase” implies holding the weight off to the side, where “waiter” holds involve holding the weight overhead at arms length like a waiter's tray. Another option is to hold a kettle bell to one side in a front rack position. Whatever the option, the point is that you are loaded more to one side than the other.

Shovel Deadlifts -

This is a great way to practice proper bracing and movement in the context of the king of all bracing exercises. Loading a barbell unevenly in a deadlift will force you to be aware of your posture and positioning and to pull evenly and deliberately, which is not how most pull. Again, treat these for what they are, an exercise in bracing and proper movement mechanics. Do NOT turn this into a heavy pull and go nuts on your max effort day. It should go without saying that you need to hit both sides with this one.

Side Plank -

One of McGill's Big 3, the side plank is a low tech way to condition your midsection and can be done without any equipment. Even though this puts the strain in the obliques, don't sleep on the rest of your midsection. Maintain posture and brace the front of your abdominals hard. When these get too easy, you can spice it up by attaching a band to something in front of you and row it with your top arm, adding in an element of anti-rotation.



ANTI-EXTENSION

Anti-extension describes movements in which you resist extending (arching) the spine. During traditional abdominal exercises like situps, planks, and leg raises, a common complaint is that tension is felt in the lower back. As the abdominals fatigue and lengthen, taking you out of a braced position, the set is still continued for the sake of meeting some arbitrary rep or time goal.

If you can't maintain a neutral spine with your body weight, how do you plan to do it with a loaded barbell? Before you attempt ab wheels and minute long planks, make sure that you can handle these simple anti-extension exercises first.

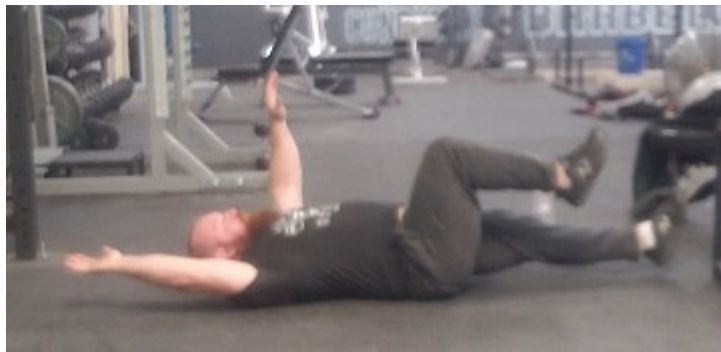
Curl Up -

Another one of McGill's Big 3, the curl up is like a crunch without the movement in the spine. Tension is held just enough to get the shoulders an inch off the ground and there's no real coordination required. Think of this as a 'feeler' movement; a way to become aware of the abdominals and improve your ability to recruit them at will.

Dead Bug -

Dead bugs are like a 'Curl Up Plus'. Once you are able to maintain a curl up for a significant period of time without shaking every time you take a breath, you can start to add in limb movement.

Lay on your back in the 90/90 position (feet in the air) and both arms straight up. Keeping absolute tension in the abdominals (a la the curl up), straighten your left leg and right arm to just an inch above the ground and return. Complete a set number of reps and switch sides.



Keep in mind that moving the limbs is not the exercise: this does nothing unless proper tension is maintained through the abdomen. Move slowly and deliberately and at an even tempo. Think of these as a bird dog in reverse, and practice these cues when you eventually move into a bird dog.

Plank -

Planks seem like an easy, low tech option, but many trainees can't hold position in their lumbar spine for very long. Doing a 2 minute plank does absolutely no good if the back arches 15 seconds in. Spending time with the curl ups and dead bugs first will help increase your awareness of your lower back position and give a bit of endurance to your abdominals.

Be completely militant with your position and only hold right up to the point that your back begins to arch. When you're able to hit a minute with perfect positioning, then you will be ready to progress to more advanced variations, like single leg, weighted, or on a stability ball.

Roll Out -

Ab rollers fall into the same category as planks, often used but almost never correctly. Only attempt these after you have mastered a traditional plank. Start on your knees, initiate the movement by pushing your hips to the ground, and do not progress past your ability to keep a neutral spine. With those who have become very comfortable with rollouts, we usually progress to doing them on the toes with a band around the waist, until the band can be eventually taken away.

MOBILITY

We put this at the end because many 'tightness' issues are not stand alone problems; rather they are a direct result of poor moving mechanics. Tight hamstrings, for instance, are common in those with anterior pelvic tilts and all the stretching in the world won't loosen them up if the position of the hips isn't corrected first. It simply doesn't matter what areas are tight when you are in a bad position; only when you understand what good posture and breathing looks like can you find which problem areas actually need to be released.

At this point, we have drilled all of the breathing and postural cues into the ground and you should have a good idea of what it should all look like. It's possible that tightness in one area or another is impacting your ability to hold a desired position, if you can get into it at all. Being able to find those tight areas and force them to comply will go a long way towards improving your setup.

Start with some type of soft tissue therapy before stretching. Foam rolling, Graston, deep tissue massage, body tempering, they all do the same thing: mashing up glued down areas of muscle tissue, forcing them to release and slide against each other better. Trouble areas can be found in the form of knots or sensitive areas (no, muscle tissue should not hurt to the touch).

After trouble areas have been worked on thoroughly, you will likely find that range of motion in that muscle has increased dramatically. At this point, focused stretches can be worked for multiple 30 second to 2 minute rounds on a daily basis to condition better movement ability. The result will be an easier time finding correct posture, ultimately leading to better breathing and bracing during big lifts.

CALVES

If you don't have one of those fancy, textured mobility sticks, use a rolling pin from the kitchen. Lay on the couch on your stomach with one leg propped up on the arm rest and have a partner slowly roll from your Achilles tendon up to the bottom of your knee. Once a sensitive spot is found, it can be rolled over back in forth in short pulses or the pin can be pressed into it for 20 or 30 seconds.

My favorite technique is to have a towel over my leg (to avoid rug burns) and have the pin pressed into the tight spot while being see-sawed back and forth. The pin will walk up and then back down the sensitive spot. It hurts. A lot. But releasing knots in the calves goes a long way to loosening up your entire posterior chain and can also help with heel pain caused by plantar fasciitis.

After the calves are thoroughly mashed, they can be stretched more efficiently. Isolating them in a stretch is easy; simply put your toe up against a wall or door jam with your heel as close to it as possible and straighten your leg. As you move your straight leg closer to the wall the stretch intensifies. At least 30 seconds in a deep stretch (preferably more) and switch.



I prefer to emphasize the calves as part of hamstring stretches. The next time you are in a deep hamstring stretch, flex your ankle (point your foot back towards you) and enjoy the excruciating pain that runs up your lower leg. In this position, I will wiggle my toes and rock my flexed ankle side to side. As the calf eventually releases, so will the tension on your hamstrings.

HAMSTRINGS

Soft tissue work on the hamstrings is best done by a partner. I've experimented with solo techniques, and had limited success. A foam roller can get in there somewhat, but it's awkward and usually more effort than it's worth.

A trained massage therapist, on the other hand, can make them sing. I have extremely tight hamstrings directly related to my anterior pelvic tilt and was able to put my palms on the ground after my last good deep tissue massage.

Another option is body tempering with a weighted pipe like Donnie Thompson's 'Ex Wife'. A heavy enough pipe is hard to come across (they get well over 100lbs), but if you can get creative, letting the weight sit on the muscle for an extended period of time can greatly improve the ability of the tissues to slide. It's beyond the scope of this book, but search 'Body Tempering' for more info.

As far as stretching, you always hear gurus giving their 2-cents about how not to stretch. 'The toe touch just stretches your lower back'. I don't care what anyone says, touching your toes stretches your hamstrings.

Given how infinitesimally small the number of people is who sustain injury from improper stretching when compared to the rather large number who injure themselves from tight hamstrings, I feel confident recommending that you err on the side of recklessness and do your toe touches.



Don't just bounce for a few seconds and call it good; stay braced and move deliberately. The abdominals should be engaged start to finish, even as the spine eventually rounds forward. And remember, you have to hold any stretch for a *minimum* of 30 seconds for it to make a difference.

I do 2 types of toe touches: postured up with a neutral spine, like a Romanian deadlift, and a complete dead hang.

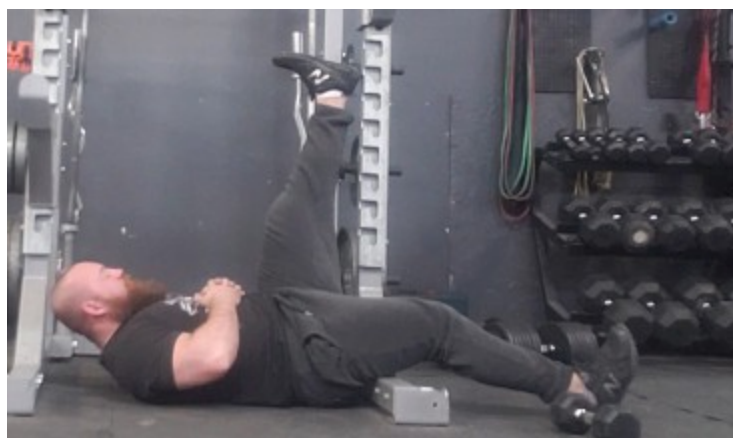
For the first one, follow all of your bracing and posture cues with soft knees and slowly push your hips back. You should feel tension in your hamstrings and possibly glutes pretty quick. I will hang in this position 30 seconds to a minute, emphasizing abdominal tightness the entire time as they fight against my hamstrings.

The hammies are tough, angry muscles and your midsection has to be absolutely rigid to win this fight. This can be a hard one to practice for very long, as the abdominals, erector, and mid-back muscles will fatigue pretty quick.

After this, I will go into type 2, the dead hang. I reset with feet wider than shoulder width and slowly start to hinge. This time, as I move, I will allow my spine to deliberately round, almost as an exercise in thoracic mobility. I will exhale, still contracting my abdominals, and arrive at a dead hang with my arms crossed and head completely down. As I release all tension through my neck and upper back, a series of cracks usually follows.

A lot of things are happening in this position: my spine is decompressed from my hip to my neck, my abs are braced, and my elongated hammies and glutes are holding the entire load. Here, I will hang as long as I can stand the pressure in my head, usually for several minutes, while keeping tension in the back of my legs. A few rounds of this paired with controlled bracing and I typically have a few extra inches of movement.

Other methods of stretching the hamstrings should be passive. I like to isolate each leg because the hamstrings put up so much of a fight. I will sit on a bench with my leg under the bar and use the bar to pull myself into the leg for a minute at a time. I also like to lie on my back next to a door jam or squat rack with one leg vertical, since it's an easier position to hold for longer periods of time.





Some light stretching before lifting is generally a good idea, but these long, deep stretches should come after. Intense stretches in the main movers right before a big lift will have a serious impact on your performance that workout. Use your warm ups to get nimble enough to perform the lift safely, but save the long torture sessions for after the workout.

HIP FLEXOR/QUADS

This is a big one because tension in this area is very often responsible for crappy hip positioning which directly effects posture and bracing.

This one is also dear to my heart because of, again, the anterior pelvic tilt. The hips tilting back shortens the hip flexor and keeps it that way, limiting it's ability to slide and move as needed. When you stand on two feet and run through your posture cues, flexing your glutes to neutralize your hips, do you feel tension in the front of your hips? If so, it's a good sign that your hips are anteriorly tilted and that your hip flexors and glutes need some work.

This is one of the easiest areas to roll out. Lay face down on the ground with a roller under your hip and one leg elevated. Slowly move yourself up and down the roller from the crease of your hip to just above your knee cap. Hunt around for tender spots and hold position there or see-saw back and forth. Hit every part of your thigh, the

vastus lateralis on the side, the rectus femorus in the middle, and the vastus medialis on the inside, 20 passes on each part. Do the same up by your hip, holding position in tender spots and rocking side to side.

The only stretch you will ever need to do here is some variation of the couch stretch. Think of a typical lunge type stretch, the only difference is that the knee is flexed so the foot is back behind you.



The couch stretch works great, but is a pain in the ass to hold for long periods of time so I prefer to do it standing. All you need is a box or safety pin at the right height so you can place your foot comfortably on it behind you. Hop forward a bit and squat down slightly while squeezing your glutes to keep your hip open. The tension down the front of your leg should be intense. 1 minute hold then switch.

ADDUCTORS

Most of you will probably cringe at the idea of doing the splits, which means your adductors are tight and weak.

I'm unaware of tissue release commonly being done in this area; seems like foam rolling would be awkward and a massage therapist might send the wrong message trying to get into that area. But one thing is sure, virtually everyone needs work on their adductors.

Aside from injury prevention, weak adductors will lead to glute inhibition. We already know how important the glutes are on hip positioning, and the position of your hips affects your posture, how you breath, and how you brace.



Stretching does not need to be dramatic, since we aren't auditioning for the Van Damme's role in the reboot of Kickboxer. A simple butterfly stretch held for 30 seconds to a minute along with a few rounds of Cossack squats will do wonders when performed regularly. Strength tends to be the bigger issue.

Adductor machines work well enough if you have access to one. The

benefit is that they are easy to scale and progress on. The negative is that you aren't working your adductors in concert with the rest of your body.

A better alternative are pinch planks, but these can be hard for most to hold right out of the gate. I recommend starting with 5-10 second holds for several sets and slowly progressing to a minute per side. They can also be done for reps, lowering yourself to the ground and popping back up. Remember to brace and mind your posture.

Banded adductions are a happy medium, since they can be scaled more easily but are also done while standing on your own two feet.

GLUTES/PIRIFORMIS

A big assumption here is that the glutes are being regularly utilized through some mode of squatting or deadlifting and, if there is a problem, it is due to being tight and overdeveloped. Some may have the opposite issue, problems stemming from inactive glutes.

Let's start with the tight glute crowd. Like the quads, the glutes are easily hit with a foam roller. Sit on the roller with one leg crossed over the other. Lean to the side of the elevated leg with one hand on the ground behind you. Rock back and forth and side to side looking for tender spots. I get locked up hard high on the hip where the glute ties in to the lower back as well as off to the side. Find where it hurts and dig in. If this is too awkward, seek out the elbow of a masseuse, a significant other, or an open minded friend.

After rolling, there's one simple stretch that can be done a few different ways. Sit on a bench with your left leg on a short box and your right leg crossed over your left. Lift the heel of your left leg, elevating your knee and bringing your right leg with it. Pull your knee up and feel where there is tension, then push your knee down. This can be done lying down with your legs crossed in a figure 4 and standing while placing your leg on a box or bench.



Just like the hamstrings, avoid overdoing the stretching right before a heavy workout.

For those with dead glute syndrome, warm ups should center around getting them firing. You want to feel them working on key movements, either by getting pumped or through the burning sensation that usually accompanies fatigue. If you do a glute heavy activity, like glute

bridges, and only feel your hamstring or lower back, you have work to do!

Glute bridges, done with both legs or one at a time, and lateral steps with a band are good tools to get the gluteals up and running. Minute long isometric holds on a 45 degree back extension usually do the trick as well (remember to brace to prevent excessive arching).





Commonly prescribed exercises like pull throughs and kettlebell swings are good on paper but they won't do anything unless you focus your energy on squeezing as hard as you can at the top. Pro tip for glute activation: finish every single hip extension with a hard glute squeeze at the top. It may take time, but you will feel them kick in eventually.

Remember, the glutes are a key part of your 'core' and are essential in setting proper hip position. Without them working to capacity, the whole bracing system falls apart.