

Deep Muscles of The Back I

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Abstract

There is an awe inspiring density found deep within the back, that demands unspeakable respect. The discussion is based on the very foundation upon which our upper quadrant rests. The infamous sacrospinalis. When developed it not only adds stunning thickness to the entire back complex, but also carries with it the secret to Herculean strength.

Within the next several pages, we will analyze intrinsic muscles of the dorsal complex, their function, the vast degree of mass they contribute to the sport of bodybuilding, and finally, the dangers one must avoid when training them.

Innervation and Purpose

An important concept discussed in this back series was the study of development. By studying the growth of a baby from week one to actual birth, we can get a much firmer grasp on the actual purpose of each muscle in the body. We noted that superficial muscles of the back, began by forming in the shoulder region, while you were developing inside your mother. These muscles then migrated down to the back area for several reasons, which have been explained. The point however, was that they originated in the shoulder region, and still, to this day, act at this particular joint.

There is a clear difference, between superficial and deep muscles of the back, and this must be clearly understood, if anything good is to come of this article. You see, deep muscles, began by developing in the axial skeleton region, and to this day remain in this very position. This lends us to three conclusions. One being the fact that they act, solely on the axial frame, namely the spinal column, two is that, this is obviously completely different from migratory muscles(these do not move the spine at all, and this is vital!), and finally it is a fact that deep muscles are innervated completely separate from their superficial counterparts.

Why are these three points important? Quite frankly, it is due to the fact, that separation, must be approached when training the dorsal complex. This is to say, performing pull-ups can work a number of superficial muscles, it will not target the intrinsic ones however(the word intrinsic means to have originated in a region, i.e. if you live in California and were born there, you are intrinsic to the state). You will have to work by literally focusing on the vertebral column, and this is a completely different aspect of training.

On a final note, when I say innervated differently, I am referring to ventral primary rami, as opposed to dorsal primary rami. You can learn more in this regard by reading my nervous system article by [clicking here](#). Briefly however, ventral primary rami, are nerves that branch off to the front of the vertebral column, these innervate the superficial muscles of the back. Dorsal rami, are nerves which branch to the rear, and these innervate the muscles that act on the axial skeleton.

Erector Spinae and Transverso-Spinalis



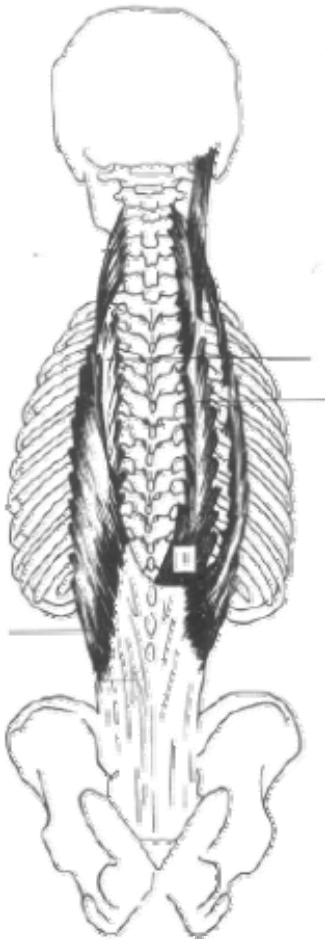
1. Aesthetics – Both of these muscles lie on the vertebral column. When Combined they add the following.

A. Borderline Density and Separation – The spine lies directly down the center of your back region. By laying down thick layers of mass, directly on this aspect of your frame, you will effectively add what I call borderline density. I say this because the vertebral column forms a natural line between the right and left aspects of the dorsal region. Muscle in this area, literally will add what looks like thickened pillars spiraling all along the center of your back. It is the hallmark of a Herculean physique.

B. The coveted Christmas Tree – The latissimus Dorsi spirals out laterally as it descends. As it does so, it creates a Backwards V, which looks like a gap down the center of your lower back. Within this space, one can clearly see the spinal erectors. When this muscle is developed, it forms what is known in bodybuilding as the Christmas tree aspect of the back. How important is this? Simply put, the lower spinal erector area of the back, is just as vital to this area, as the abdominals are to a finished anterior view of the body! Perhaps even more so.

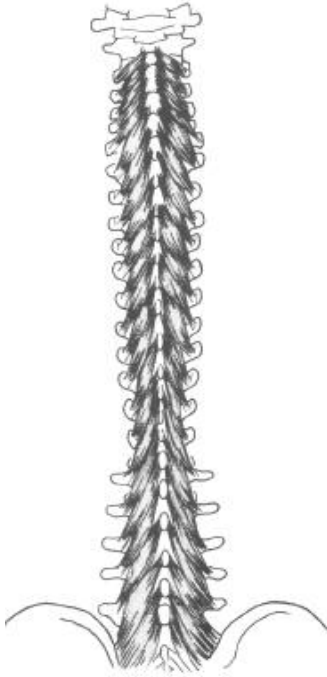
C. The Shrink Wrap Look – One of the most difficult aspects of bodybuilding is to get that shrink wrapped, paper thin skin look in the abdominal region. One of the ways to accomplish this, is to literally tighten the skin in the area by filling it in with muscle. By adding direct mass to the spinal erectors, you will not only build the Christmas tree look, but you will literally pull the skin of your lower torso backwards, thereby tightening your waist and etching more cuts into the abdominal region!

Anatomical Analysis of The Deep Muscles of The Back



1. Spinal Erectors – This is actually a group of three different muscles. However, we will view them as one large unit, with one specific action. An explanation, in regards to origin and insertion points, is fairly easy, in that this muscle group is also named the Sacrospinalis. Meaning that it originates and inserts all along the vertebral column, beginning at the sacral region(the gluteal region, or your rear end if you will) all the way up the spine to the cervical or neck region. It also has some of its origin along the ribs and iliac crests(the hip bones).

2. Transversospinalis – Again, the name says it all. Every vertebrae has a spinous process and two transverse processes.



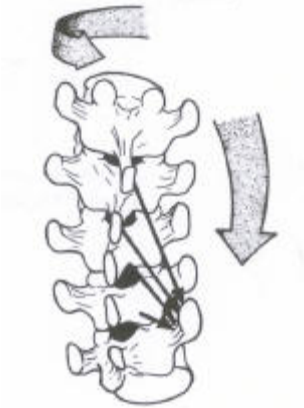
This muscle runs along the entire vertebral **column**. It is a tremendous muscle group to say the least. It is responsible for separating the left side of the back, from the right. Its origins lie on the transverse processes, and its insertion points are always on the spinous processes. I stated origins, due to the fact, that the transversospinalis is a group of short strap like muscles all along the vertebral column.

And of course, collectively they form two massive pillars descending down the entire back region.

Physiological Analysis

Spinal Erectors – As the name implies, when these muscles contract, they extend the spine and keep it in an erect position.

Transversospinalis – Muscles almost always pull insertion points, toward origins when at work. This muscle, therefore pulls the transverse processes toward the spinous processes, in effect, it produces localized rotations of the vertebral column. It can also initiate side bending.



Before we can apply the actions listed above, I would like to analyze the mechanics involved when considering the backbone / vertebral column.

Gravitational Influences on Weight Distribution

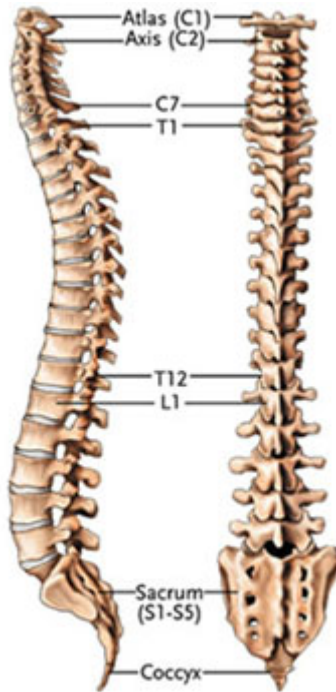
In order to clearly understand the vertebral column / backbone, one must once again analyze its development embryologically. When you were in Utero(your mother's womb) you were positioned in a fetal position, which translates to a respectively curved backbone. This curvature appears to look very much like the letter

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Anatomically this is stated to be a primary curvature(meaning that this was the state in which your spine originally was positioned). We can also state this as being posteriorly convex. The word convex simply means the object(vertebral column) is curved or rounded relative to the area to which you referred(to the rear of your body, or posterior to the body).

Near the end of your time in the womb, you begin to hold your head back, and after birth you quickly master the process. As you continued to hold your head back on your own, your nervous system began to adapt, as well as your musculature, until you were strong enough to maintain this position as the permanent standard. In doing this, your spine adapted by developing a secondary curvature. This morphological change occurred in the neck or cervical region of the backbone, and it faces opposite to that of the fetal position, which is to say, it is posteriorly concave(if I were to stand behind you, I would see your neck curved inwards).

When you began to crawl, and eventually walk the vertebral column developed an additional secondary curvature in your lumbar or lower back region. However, the other aspects of the column remained in a fetal position. These include the thoracic(rib region – for every rib, you have a vertebrae), the sacral(gluteal region), and coccygeal region(near groin area).



What was just discussed above is vital. I say this, because these curvatures occur for a very specific reason. That reason is to adequately distribute the force of gravity throughout the body, with as much energy conservation as possible. If we understand, how the line of gravity, passes through our body, we can better grasp, how the muscles of our spine react to this specific pull.



The line of gravity when you are in a normal erect position, maintains the vertebral curvatures by intersecting the secondary and primary curvatures exactly at the point in which the cervical region meets the thoracic region, and where the lumbar meets the sacral region. In doing so, the force acts in such a way as to pull the vertebral column forward. In other words, while standing, the muscles in your back, namely the sacrospinalis, must continually contract against gravity in order to stay erect. This means that these muscles are continually at work!

If we further analyze this however, we see that the cervical region, only bares the weight of the head, and neck, this is why the vertebrae here are not as large as their descending counterparts. The thoracic region is larger, and gets much support from the ribs anteriorly, however, the lumbar or lower back region, must carry the passing weight of the head, neck, thorax and abdomen. It must essentially bare the weight of half of the body! This leads us to a greater understanding of where injuries will most likely occur!

Finally, the line of gravity passes posterior to the hip joint, anterior to the knee joint, and anterior to the ankle joints. In order to stand your hips and knees must be extended. By passing posterior to the hip joint, gravity helps extend the hip, and completely extends the knee joint. While standing you do not need to use your quads to maintain extension! However, gravity passes anterior to the ankle, pulling it into a dorsi flexed position. By doing so, if an erect position is to be maintained, the posterior calf muscles must continually contract. This is why many people have naturally large calves. By way of design, there is a huge vein and artery which

supply the calves with blood and drainage in the posterior leg. This explains why blood pumps are obtained so quickly in the area as well.

Working With Curvatures

The contours within the vertebral column are there for a reason. To provide the least amount of strain to muscles, tendons, and ligaments in this vital region. I say vital, because this is the machinery that houses one of our most precious assets, the spinal cord! Additionally, a strain in this area, can and will affect your entire mode of transportation, and ability to perform in the gym.

My goal, therefore, for you, as an athlete, is to maintain and actually maximize your vertebral curvatures. If they are compromised in any way, shape or form, it will affect future lifts, and seriously heighten your risk for future injuries.

Imbalances Explained

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Imagine, that your back bone is the center pole in a tent. Attached to either side of this pole are guy wires. The pole supports the guy wires, the tension of the guy wires, in turn affects the poles positioning. If the guy wire on the left side is of equal strength to the wire to the right, then the pole will stay centered, and the tent will maintain a perfect structure, and function. However, let's say that the right wire is twice as strong, and pulls twice as hard on the center pole, then compared to the left. What will happen? The center structure will be pulled and lean toward the right, and in turn, your tent will be completely crooked.

This same principle can be applied to the curvatures in your back. If your abdominals, are weak, then the strength of your deep back muscles will pull the curvatures into an exaggerated formation. When this occurs, back aches, or future strains are heightened! Therefore our first goal is to strengthen the abdominal wall. I will cover this greater, when I write the anatomy article for this muscle group, but my point is, that you will want to work this muscle group as often as you work your other muscles. You can find current information for this subject, by clicking on the links below:

1. [Animals Guide To Abdominal Training](#)
2. [Animals Eight Week Abdominal Program](#)
3. [Basic Abdominal Program in 12 Weeks To Burning Fat](#)

Aside from the above links, I must emphasize an excellent technique for improving vertebral curvature in the lumbar region. This has been used for as long as exercise physiology has been around, and I recommend it highly. The process is known as the pelvic tilt. Here is how you are to perform it.

Pelvic Tilts – **A.** Lie on your back and bend your knees. Your head should be flat on the ground, and you should look straight towards the ceiling. The goal here is to flatten the lower back out here. By bending your knees towards you, you will in turn tilt your pelvis beneath your body, and begin to flatten your back out. Remember,

the goal is to flatten your back before performing crunches. **B.** From here rotate your pelvis up and toward your abdominal area. You will know you are performing this correctly if your back flattens out. Here is an illustration.



The Key is to tighten your stomach muscles and gently press the arch of your back into the floor

The purpose of this, is straight to the point. If you have weak abdominals, this relieves the over exaggerated curve in the lumbar spine while you are performing abdominal exercises. Additionally, it places more overload on the target muscle group. The real crux of the situation is this: You are trying to build your back extensors bodybuilding purposes, but you must counter act this muscle gain, with a set of strong flexors. It would be a mistake to work one, and ignore the other, as an immediate imbalance, can and will occur.

Posture

Right now, without changing your positioning, check out, how your posture is while seated. It seems, a natural tendency to hunch semi forward, slouching if you will. This can have serious and adverse effects on your training regimen. Aside from having antagonistic muscles(ones that perform the opposite movement of each other), in your torso, you also have ligaments, that are polar opposites of each other.

Posture, that emphasizes slouching will strain your posterior ligaments, and seriously weaken the inter-vertebral disks in between adjacent vertebrae. It also has a third adverse affect however. A continual stretching of the posterior back muscles will lead to extremely tight anterior muscles. As you will see shortly, this is an extreme negative.

To improve your posture, you will want to sit up straight, put the small of your back into the chair(as you did while performing Pelvic tilts) , straighten your neck, and contract your posterior, superficial back muscles(rhomboids and traps) so as to keep your shoulder blades back, and together. Keeping your abs tight, will also contribute to strong, and optimum back curvatures.

Eliminate Disk Problems

Without all contradiction, disk problems are an athlete's greatest foe. I cover this subject extensively in my first back article. [Click here](#) to be taken to the exact spot of reference.

As a quick review to the above link. Between each adjacent vertebrae lies a disk of cartilage which absorbs shock, and allows an athlete great mobility. If this disk slips out of place, you are screwed, as such a herniation will press directly onto a nerve, causing excruciating, unimaginable, agonizing pain! Within the disk lies an extremely jelly like substance, called the nucleus pulposus. This lies more posterior within the vertebral disk. This, like jelly in a donut can rupture through the disk, causing it to squirt out, and again hit a nerve, or something worse. The key points are

1. You have weaker ligaments dorsally, then ventrally on your backbone.
2. The nucleus pulposus is directed more posteriorly, in the disk.
3. There is a hole(foramen) posterio-laterally between disks

All this leads to one conclusion. Most injuries occur to the rear, and side of the column.

What we will do now, is discuss in greater detail, how to avoid such injuries. It is apparent that you are in your most vulnerable position, when the spine is flexed. In other words, when you bend forward, the disk has the least amount of protection.

*That is what happens when we flex our spines, or bend forward if you will. As you can ascertain, the more force placed on the disk, during flexion, the more pressure is placed on the posterior aspect of the disk. Imagine bending down, flexing your spine, and deadlifting a few hundred pounds. The pressure you just placed on that disk is enormous! **Anatomy of The Back I***

Conceptually, one must first understand, in what order muscles are recruited during basic lifts. The greatest notion to understand, is that when my spine is flexed, my extensors are not at work. Therefore if I pick up a weight, with my spine flexed and lift it, all the pressure of that weight, has just been transferred to my posterior ligaments(risking strain, and weakness), and is of course daring your disk to rupture or slip.

Several people will go the middle route, and begin slightly flexed, and extend during the lift. This is again highly dangerous. Which leads to an extremely vital point. That is, one must maintain a tight, strong arch, namely in the lumbar region of the spine when lifting a weight.

Your lower back has a natural secondary curve. When you are lifting heavy weight, you will want to tighten, and emphasize this curve. By doing so, you will eliminate the tremendous high risks discussed above. Furthermore, when we look at building the back up, we need to realize that they are primarily extensors. Maintaining a tight extension, will not only lower injury, but build a freaky back, that much quicker! This is also, a proven method for improving the squat and deadlift immediately. As soon as this strong arch is lost, during any power movement, you lose the extreme power provided by your extensors, and with it, you lose the battle against the weight.

Tips outlined:

1. Never, ever begin, by picking a weight up, with any forward curve in your spine.
2. Begin, all your lifts with a tight arch. This is formed, by a keen understanding of the secondary curvature in your spine. You can get a greater grasp of it, by practicing the following cat and camel stretch:



Arch back and hold for target time.

Apply that same arch to your lifts and you will succeed. One outstanding tip, from our local deadlifting expert JP, is as follows:

Looking straight up(when deadlifting) is one of the easiest ways to exaggerate the motion and get your body locked in the strong arch. It might look funny to people around you, but when their puny backs snap like the pathetic weakened twigs they are, you can simply stand there and laugh. Look up, lock the arch, and be strong!
Quote – **Mr. Deadlift**

The man, has a way with words, there is no doubt! You might try that as well, it is excellent advice.

3. During any lift, focus, on never losing this positioning. As soon as you begin leaning forward, check yourself. It is at this moment, when the arch is usually lost. And at all costs, do not supercede your flexibility. Take the stiff legged deadlift for example. Stop your decent, right when you feel tightness in the muscles, to the point that any further movement would require you to round the back. This is the beginning of sorrows for any athlete.
4. Just as you did, to fortify your posture, you will want to squeeze your shoulder blades together tightly.

5. By flexing your abdominals, you will enhance force output in the lift, and avoid strains from hyperextension. This flexation, is vital for maintaining a proper curvature in the spine. Keep them tight!

The final suggestion I have, is to eliminate other weaknesses in the body, that would adversely affect the spine. Namely, tight, and or weak muscles. We will analyze this below.

Final Factors - Effective Safety and Flexibility

If there was a specific truth I could highlight, it would be this: when studying joints, specific movements, and namely attachment sites, always evaluate each and every muscle that has a connection to that specific site. That is to say, if the pelvis attaches to the vertebral column, what else attaches to the pelvis? This is for quite obvious reasons. As tight muscles, opposite of the spine, will adversely affect pelvic alignment, thus affecting spinal function, and natural curvatures. You will have a difficult time maintaining your strong arch, and most definitely a very arduous time maintaining a full range of motion, without compromising form.

What we will want to focus on, therefore, will be to keep key muscles loose, in turn, allowing the spine to function in a top flight manner. My suggestion, is to therefore, stretch each of these muscle groups, at least lightly before performing any exercise, that is going to work the back. Or at least, stretching them thoroughly once a week. The key to any stretching routine, is to understand, what the muscle group, or groups do in the body(i.e. biceps flex the elbow joint) and then stretch them the opposite way. If the quads extend the knee joint, then flexing it will stretch them.

1. Hip Flexors – This is a major target area. The main hip flexors are worked tremendously in squatting exercises. Many athletes are extremely strong in this area, but they face a major, major problem! You see, this set of muscle groups passes anteriorly to the Os coxa(another name for pelvis, this region consists of three bones, the ilium, the ischium and the pubic bone, we will thoroughly discuss this when we delve into the anatomy of the lower extremity). Having a strong set of hip flexors are excellent, if they are flexible! However, I will again, use your forearm flexors as an example to illustrate my point. Look at your hands at rest. Your fingers are naturally curled correct? This is due to the fact that you have stronger flexors then extensors. This pulls the phalangeal joints in the hands into a generally closed position at rest. The same holds true for the hip flexors. If they are stronger, they will pull your Os coxa ventrally due to extreme tightness and literal shortening of the tendons. By stretching this area, you will alleviate this problem.

These muscles flex the hip(pull it towards your chest), you will want to therefore extend it for maximum results. I recommend lying face down on the ground, and pushing up(just like a pushup) with the arms, you will feel a tremendous stretch in the flexors.

2. Hamstrings and Glutes – Tight hams and glutes would have the opposite effect on the pelvis. Additionally, they are one of the major, major culprits for the inducement of back injuries. When our hammies are tight, we almost always tend to lean towards the tips of our toes, and in turn compromise the strong arch. An athlete can live with a substandard, poor range of motion their entire career or zap it at the source.

3. Groin – Again, this is a major target area for screwing your range of motion, during deadlifts, or squats. I recommend the basic butterfly stretch.

4. Calves – You would be surprised at how much more you can immediately lift when squatting by just stretching the calves. Namely your shin region.

For further information on stretching [click here](#)

Before entering into the realm of inducing hypertrophy in the final muscles of the posterior complex, I had to cover the vitality of range of motion, curvatures, and injury prevention. This is an extremely serious area for any athlete to address. But you came here to get freakier, and it's high time we got into that very subject!

[Click Here](#) For Part II of Deep Muscles of The Back

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