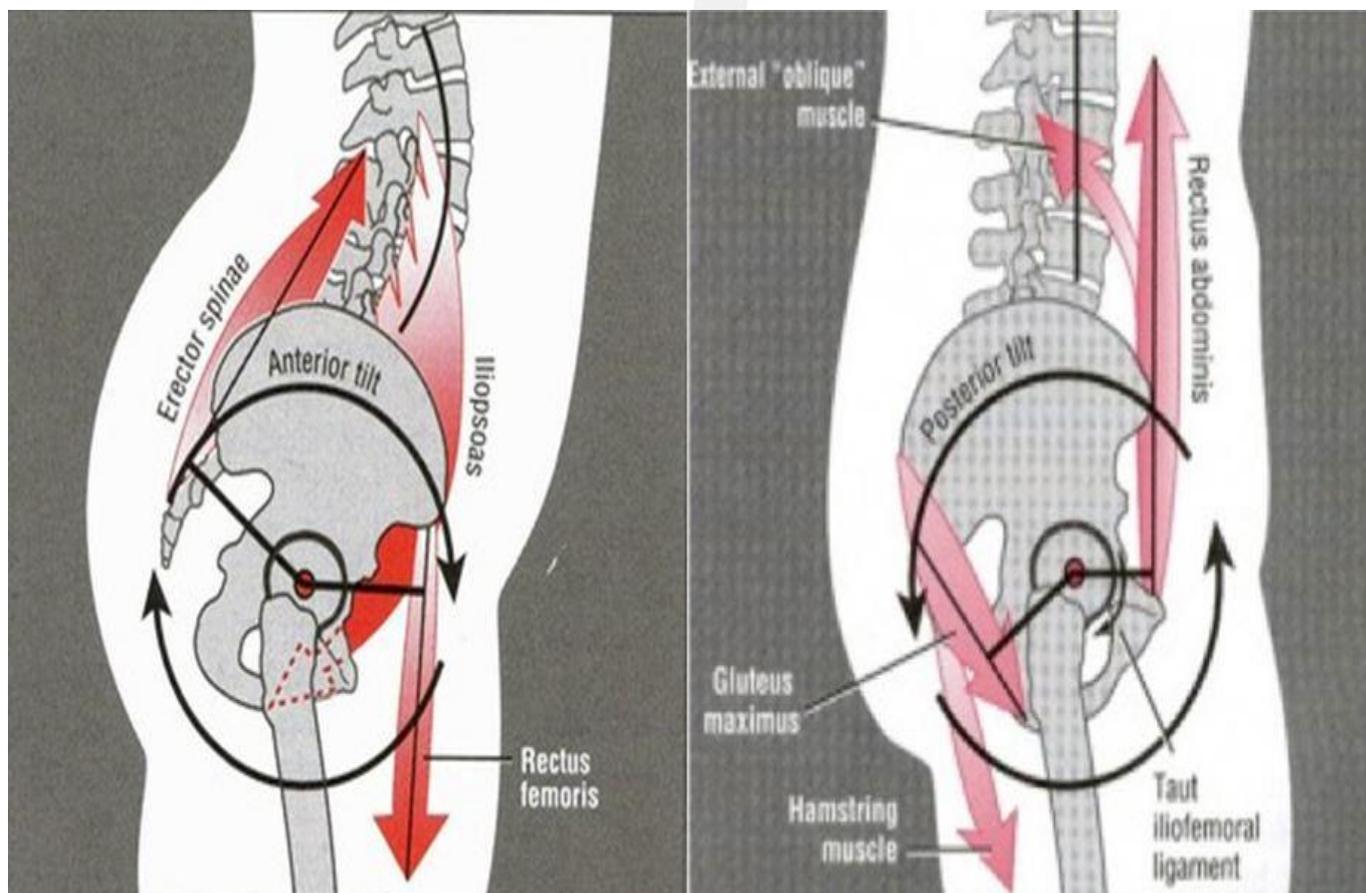


## Why do I Anterior Pelvic Tilt?

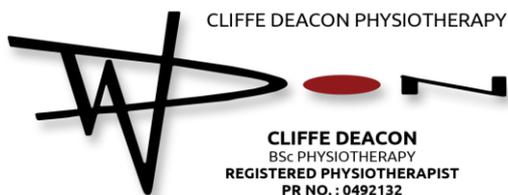
By: Bret Contreras

When performing hip extension exercises, an alarming number of lifters move their pelvises into excessive anterior tilt. This can occur during squats, deadlifts, good mornings, back extensions, reverse hypers, hip thrusts, and barbell glute bridges. It's important that the reader first understands what anterior pelvic tilt is before reading further. See the picture below. Tilting the pelvis forwards as in the case of the first picture is referred to as *anterior pelvic tilt*, whereas tilting the pelvis rearward as in the case of the second picture is referred to as *posterior pelvic tilt*.



### Anterior pelvic tilt vs. Posterior pelvic tilt

Stand up and take a moment to move your pelvis into these positions. Notice the different musculature responsible for producing these motions. If you do them correctly, you'll feel the lumbar erectors and hip flexors tilting the pelvis anteriorly, and you'll feel the glutes and low abs tilting the pelvis posteriorly.



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## What's the Safest Pelvic Position During Resistance Exercise?

What's the safest pelvic position during heavy resistance training? The answer to this question depends on who you ask. [Stu McGill](#), the world's leading expert in spinal biomechanics in relation to strength training, would tell you that the neutral position is always best for spine safety...both neutral spine and neutral pelvis. However, two legendary sports scientists by the names of Yuri Verkhoshansky and Mel Siff (also the authors of [Supertraining](#)), felt otherwise.

According to them:

The pelvis plays a vital role in the ability of the athlete to produce strength efficiently and safely, because it is the major link between the spinal column and the lower extremities... a *neutral pelvic tilt* offers the least stressful position for sitting, standing and walking. It is only when a load (or bodymass) is lifted or resisted that other types of pelvic tilt become necessary. Even then, only sufficient tilt is used to prevent excessive spinal flexion or extension... The *posterior pelvic tilt* is the appropriate pelvic rotation for sit-ups or lifting objects above waist level. Conversely... the *anterior pelvic tilt* is the correct pelvic rotation for squatting [and] lifting heavy loads off the floor. – Supertraining 2009 (Hat tip to Pavel Tsatsouline for finding this quote)

I've asked Stu for his take on this matter and again, he believes that neutral spine and neutral pelvic position is always best. However, I'm inclined to agree with Yuri and Mel. Don't get me wrong, I've learned much of my spinal biomechanics knowledge from Stu and highly respect him. In this case, I feel that some slight pelvic tilt can help buttress the spine by creating torque in the necessary direction in order to help stabilize the spine and prevent buckling. However, the pelvic tilt isn't to end-range so it doesn't dramatically impact spinal posture, but rather keeps it in check.

## Why Would Optimal Pelvic Position be Different for Squats & Deadlifts Versus Hip Thrusts and Back Extensions?

The most challenging portion of the squat motion is the parallel position, and the most challenging portion of the deadlift is at lift-off. At these positions, tremendous spinal flexion torque is induced upon the spine, along with tremendous posterior pelvic tilt torque. Strong erector spinae muscles must counter this torque by providing sufficient muscle force to stabilize both the spine and pelvis.

However, the most challenging portion of the hip thrust and back extension motions is the very top, at lock-out. At these positions, you won't find the tremendous spinal flexion and posterior pelvic tilt torques that you see during squats and deadlifts, but nevertheless the erectors typically fire very hard during these movements, creating high muscle forces and therefore spinal extension and anterior pelvic tilt torques.

If you haven't yet watched this video, check it out and things will hopefully click:

## Why Does My Body Want to Anterior Tilt the Pelvis Rather than Stay in Neutral?

There are two main reasons cited by most S&C experts as to why a lifter moves their pelvic into excessive anterior pelvic tilt during hip extension exercises:

1. Substituting lumbar extension for hip extension (also referred to as “lumbar compensation”)
2. Stabilizing the lumbar spine through body approximation

I don't feel that either of these explanations paint the entire picture. During planks and push-ups, many individuals will indeed stabilize their spines by hyperextending the lumbar spine. Rather than rely on muscle force to stabilize their spines, they just let the spine stabilize itself and allowing the posterior aspects of the vertebrae to jam together.



Excessive anterior pelvic tilt and lumbar hyperextension during push-ups

With squats, especially deep squats, the pelvis is often pulled into posterior tilt and then the lumbar spine goes along for the ride into flexion, due to the hips running out of flexion ROM or excessively tight musculature. To deep squat properly, a lifter must possess great hip flexion mobility and be able to produce impressive levels of spinal extension torque and anterior pelvic tilt torque at the

bottom of the squat movement to prevent the spine from rounding. The same is needed for deadlifts as well.

But with back extensions and hip thrusts, lifters move into excessive anterior pelvic tilt for different reasons. This is why:

1. Hip extension requirements are very large, and the higher you rise, the harder it becomes
2. As the movements rise, the hip extensors must contract very hard to produce hip extension
3. Hip extension torque is carried out primarily by the gluteus maximus, hamstrings, and adductors
4. Some lifters rely more on hamstrings for hip extension torque production, some adductors, and some glutes
5. If the pelvis is kept tilted anteriorly, the hamstrings are lengthened slightly, putting them into better positions to produce force
6. The majority of lifters initially possess weak glutes, both as end-range hip extensors and as posterior pelvic tilers
7. These lifters tilt the pelvis in order to further recruit the hamstrings in order to compensate for their weak glutes

In summary, I believe that these lifters overly-tilt their pelvises forward in order to allow the hamstrings to produce more force to compensate for weak gluteus maximus muscles that aren't strong enough to finish off hip extension and provide sufficient posterior pelvic tilt torque to stabilize the pelvis (and therefore spine).



Excessive anterior pelvic tilt and lumbar hyperextension during back extensions



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### How Do I Go About Fixing This?

I wrote a detailed article on this topic [HERE](#). Please click on the link and read up if you're interested. Essentially, you can stretch the hip flexors and strengthen the low abs, but by far you'll get the greatest bang for your buck by performing hip thrusts, American deadlifts, and RKC planks.

In a couple of days I'll post a couple of new videos showing variations of barbell glute bridges and back extensions. These videos will further assist lifters in correcting lumbar hyperextension and excessive anterior pelvic tilt during resistance training. Please stay tuned for that.



Excessive anterior pelvic tilt and lumbar hyperextension is okay in some situations