

# The Fallacy of Hyperextension

by Ken Hutchins

Often, therapists, trainers, chiropractors, and orthopedic surgeons witness back arching during exercise, subsequently remarking that this is somehow dangerous and that such *hyperextension* (especially of the back) is to be avoided and unethical to encourage.

The term, *hyperextension*, is fraught with confusion. It is often misapplied for two major reasons. We beseech physicians and therapists to sit back and reflect on what they mean by the term. They should then consider if what they fear actually happens in those exercises that traditionally elicit their criticisms.

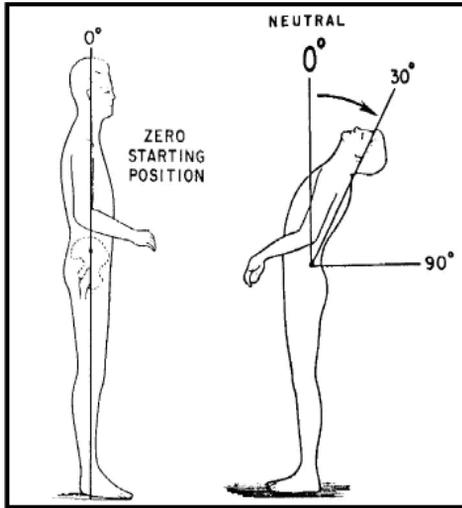
We will focus on this term as it applies to the back, or more particularly, the torso.

## Three Definitions

There are several possible definitions for “hyperextension.” Although we may explore more, three stand out.

**First Definition:** The first definition involves the term as defined by conventional standards of anatomical position. *Joint Motion—Method of Measuring and Recording by the American Academy of Orthopaedic Surgeons* states that hyperextension is “motion [or position] opposite to flexion at the zero starting position....”

“Zero starting position” or neutral position of the spine is depicted in the accompanying diagram. Of course, this varies between



individuals, but the standard is defined here for practical reference. By definition, hyperextension is any spinal position behind “0.”

Wait! There remains one more often-overlooked qualification. The AAOS nomenclature guide also restricts use of “hyperextension” to those joints where movement position behind anatomical zero is “unnatural.” For example, movement or position behind anatomical zero of the knee or elbow is deemed “unnatural” and hence “hyperextension.”

The use of natural is poor distinction as it was abused as early as Aristotle when he claimed that the locomotion of mollusks was unnatural. Well, if nature created it, “how is it unnatural?” I plead.

But such movement or position is deemed “natural” for the shoulders, wrists or spine. Hence, *hyperextension* does not apply to these bodily excursions. So, many professionals mistakenly carry the concept of hyperextension beyond its formal restriction.

The use of “natural” and “unnatural” contributes nothing but more confusion. These are unqualified descriptions that are often called to arms to boost support for weak arguments. Similarly, I once (about 1980) entertained the criticism from John Pate, M.D., (one-time family friend of Arthur Jones in Deland, Florida, before

he became the ENT department head at Tulane Medical School.) that the performance of stiff-legged deadlift is “non-physiologic.” I remained confused about this statement for years until I unraveled in my mind the definition of “exercise” and realized therefrom that exercise is based on muscle and joint function, not behavior. This is where Pate was off tract.

Just for the record, stiff-legged deadlift with a barbell is an excellent exercise when performed with the right subject in a very controlled environment and in a very controlled manner. And since this control is very unlikely to be had I recommend against this exercise.

**Second Definition:** the second definition might also be called “full extension” or “furthest active extension due to volitional muscular contraction.”

Stand erect. Slowly begin to extend your entire torso. Eventually do so as hard as possible, but apply the muscular force slowly with gradual intensification. The greatest extension attained is then your “full extension” or “furthest active extension due to volitional muscular contraction.”

By the way, this is similar to one of the extension exercises prescribed in New Zealand (Robin Mackenzie) and Australia for patients suffering from sciatica and other back problems. The extension approach seems to have better results for many patients that do not respond to mainstream therapy concepts.

The rest of Western medicine goes the opposite direction for most back therapy. Myth and conventional wisdom prevail saying that flexion of the spine avoids compression of the nucleus pulposus—the disk—and that extension is to be avoided. This is epitomized by the popular physician’s standby: *Williams’ Flexion Exercises*.

Williams’ Flexion Exercises are often helpful. They at least show a patient how to round out the lower back to sometimes relieve

tension and pain. They also enable the patient to endure long-term standing and sitting by using the pelvic tilt. The flexion concept is great for *postural correction and pain relief* in some cases.

Williams' Flexion Exercises; however, must be placed in their proper context. They do not serve—as misstated by Williams—to strengthen a weak back. Abdominal strength is not the major concern in back rehabilitation—Williams and others emphasize abdominal strengthening. Also contrary to Williams: many sciatica patients gain great relief from strenuous back extension exercises using a Nautilus Lower Back machine or the MedX Lumbar. This appears to agree with the approach of the New Zealanders.

Indeed, the facets located on the posterior aspect of the adjoining vertebral bodies serve both as articulating surfaces and fulcrums. Decompression, not compression, of the nucleus pulposus results during extension. Perhaps this explains why so many sciatica patients find instant relief when performing extension on the Nautilus Lower Back machine and the MedX Lumbar and then complain of pain in the most-flexed position. Often, the flexed position must be delimited.

**Third Definition:** Now extend your torso beyond your full extension. [This is a thought experiment. Don't really do this!] To extend past your full extension, you require additional force other than that from a slow, even muscular contraction. This additional force may be the result of momentum or applied force from an outside source.

For instance, if we lock your pelvis and lower body in a restraining device and then apply adequate force to your chest or shoulders, we can push your spine beyond *full extension*. This is the third definition of *hyperextension*. It most appropriately carries the negative connotation and imagery of the prefix, *hyper*—excessive, extreme, too much.

Just in case we've confused these three definitions for

*hyperextension* with explanation let's briefly repeat them:

First—*back extension movement or position past (behind) anatomical zero.*

Second—*complete or full extension.* Note that this may or may not be beyond (behind) anatomical zero, depending on the limitations of the subject.

Third—*Dangerous Extension beyond full extension.*

There remains one more inconsistency in the sloppy usage of *hyperextension*. If *hyperextension* of the spine is applied to anatomical zero—as the AAOS manual indeed restricts but most practitioners overlook—then *hyperextension* is movement or position posterior to anatomical zero. Are we now so silly as to say that movement or position anterior to anatomical zero is “hyperflexion?”

And if we accept the negative connotation of the prefix, *hyper* are we then to conclude that any position other than anatomical zero is somehow *bad*? Are we not then defining the only *proper* or *safe* position of the spine as zero and that no movement is to occur? Of course, this becomes ridiculous.

We should also briefly acknowledge that *hyperextension* is also used as the name of a back-extension exercise movement, per se. This might be a fourth use of the term. This merely contributes more confusion. In addition to adjective, it is now nomenative.

## Misplaced Blame

We mentioned earlier that *hyperextension* is misapplied for two reasons. The first is the definitional inaccuracy we have already discussed. The second reason is a misplaced fear toward particular exercise machines and/or exercise movements.

Natural tendency was to fear extension in the Nautilus Hip & Back and the Lower Back machines, In fact, standard procedure for the Lower Back machine protocol at one time was to delimit extension—not for fear of physical injury but to appease the fears of those who did not understand what they were seeing. Nautilus was simply trying to avoid “screaming fire in the theater,” so to speak.

Note that the resistance direction in these machines impedes and inhibits extension, though the machine certainly cannot prevent excessive and injurious extension if the subject moves excessively fast.

Let’s return to the demonstration where you achieved full active extension of the back. To achieve the necessary direction of force to push the torso beyond full extension requires a resistance applied in the direction toward extension. This excludes the Lower Back and Hip&Back machines. If any suspicion is to be laid, it should point toward the Pullover and the Abdominal machines—the therapist’s favorite focus for back therapy.

This unjustified fear of complete trunk extension is manifested in the MedX Lumbar machine design as well.

## Pain

Pain, especially joint and nerve pain, is a negative indication to many things. Still, the origin of pain and the conditions of its eliciting must be assessed by the physician or therapist. Doing so becomes an art form in itself. Pain limitations, despite common classification of exact diagnosis, often appear differently in each patient.

For example, if ten patients are diagnosed with the exact same condition by the same competent physician, each patient will exhibit pain limitations and tolerance to a different mix of Nautilus exercise selections. Some Nautilus movements (example: Leg

Curl) are suspiciously pain eliciting for all back patients. But the therapist really doesn't know the patient's tolerance for certain until he tests the patient on every available Nautilus machine and exercise movement. Often, the Leg Curl is found to be innocent. [Due to the inability to stabilize the pelvis in a prone leg curl, only a seated leg curl is appropriate for safe use regardless of the subject's back condition.]

Extreme “arching” (a bad word as arching occurs in many directions), more correctly, *extension*, of the lower back is definitely contraindicated in many back patients. This is an individual assessment, however, and applies independently to static and dynamic conditions. The common-sense guideline remains as the old dictum, “if it hurts don't do it.”

If a back patient encounters sharp pain with any selected position during acute inflammation—at rest or otherwise—this is the sign to avoid said position and movement. After inflammation has subsided, such positional pain often decreases, moves to other extremes or arc locations, or totally disappears. SuperSlow strengthening exercises can and must then commence within the range restriction of pain.

Furthermore, the hope of improvement must be relinquished by many patients if we are resigned to avoid pain entirely. We must strive to simulate muscular strengthening anywhere and everywhere we can within the limits of pain. And sometimes we must work right up to the edge of painful positions, even endure moderate discomfort on occasion.

To relate this to our discussion of hyperextension: extreme extension of the torso—in and of itself, especially in Hip&Back or Lower Back or Leg Curl or MedX Lumbar machines—is not to be feared. This is true unless we are dealing with a debilitated condition—either rehabilitatively or from the standpoint of preexisting trauma. In either case, pain, not position, will almost always signal contraindication.

## Summary

The concept, *hyperextension of the back*, is a morass of confused definition, irrational fears, and misapplied mechanics. Since a dialogue on this subject rarely includes pre-established meaning, usage of *hyperextension*—as with any subject devoid of definition—rarely serves a beneficial purpose.

[Please note that I wrote this in 1990, before the advent of SuperSlow, RenEx, and my Linear Spine machine development.  
—Ken]