

# Are Crunches and Back Extensions Breaking Your Spine?

Traditional sit ups, crunches and back extensions do more harm to the lower back than most people realize. What is worse is they do very little to improve core stability and protect the lower back from injury.

Dan Gabelman

**Many of my clients and some athletes at MBSC have asked why there are very minimal "crunches" and no back extensions in the training programs they perform. The information presented below is what I simplify in my answers to them and will either be a great reminder or enlightening information on how these exercises affect your spine. In addition I will explain the function of the "core," and why there is still some "crunching" in programs using a straight leg sit-up progression.**

## **A couple of reasons to avoid these exercises:**

1) "The traditional sit-up imposes approximately 3300 N or about 730 pounds of compression on the spine." (McGill, 88) This means that every time you do a sit-up, knees bent with feet locked under something, sitting up from the ground to vertical, that amount of pressure is crushing your intervertebral discs. Since most people seem to think that 300-500 crunches a day is necessary for six-pack abs that is 990,000 N or 219,000lbs of pressure on your spine and discs at a minimum. Lastly, "The National Institute of Occupational Safety and Health has set the action limit for low back compression at 3300 N. Repetitive loading about this level is linked with higher injury rates in workers, yet this is imposed on the spine with each repetition of the sit-up!" (McGill, 88)

2) Back extensions are no better. On the roman chair (this is the piece of equipment that is set at 45 degrees and you can lock your feet and rest your thighs on it so that you can drop and lift your upper body, working the back) performing one back extension, imposes over 4000 N or about 890lbs of compression on the spine (McGill 91). In addition, there are many exercises performed on the floor lying on the stomach where some combination of the arms and legs are raised, or the entire torso is lifted off the ground. These types of exercises impose up to 6000 N or over 1300lbs of spinal load and compression (McGill, 91). These exercises are referred to as the "superman", "opposite arm opposite leg raise", "prone cobra", etc. Please avoid these exercises at all costs! Finally, the front squat (my personal preference) and deadlift both work the back and spine in the biomechanically correct fashion. Any variation of these such as the kettlebell deadlift, off-set kettlebell squat, front squat, 1-leg SLDL, trap bar deadlift, plate deadlifts, etc, function the same way. There is no isolation of the muscles and the body works as one functional unit.

## **So how does the core function?**

3) I think my favorite explanation of the core and its function comes from Dr. Shirley Sahrmann, DPT, and her textbook Diagnoses and Treatment of Movement Impairment Syndromes. In this text she states, "The most important aspect of abdominal muscle performance is obtaining the control that is necessary to 1) Appropriately stabilize the spine, 2) Maintain optimal alignment and movement relationships between the pelvis and spine, and 3) Prevent excessive stress and compensatory motions of the pelvis during movements of the extremities." (Sahrmann, 69)

4) Hopefully Point 3 above enlightens you as to why we do so many cable chops, lifts, and anti-rotation exercises. When we look at the core and these exercises you can see that what we are trying to do is train the core to stabilize the pelvis, and to efficiently transfer force to the arms and legs.

## **What does this all mean?**

5) In the end, what I'm trying to get across is that you may have to take a second look at some of what people feel are their "favorite" exercises and view them differently to try to make intelligent choices when training. There is obvious risk taken by working out, but if we can make good choices we can do a better job at avoiding injury.

6) As I stated in the opening, from my point of view, sitting up and spinal flexion, although hard on the spine, is still necessary strength. When we look at function and everyday life, if you sit up to get out of bed, get up from a deep couch, are involved in any type of martial arts, boxing, or sports it is necessary to have abdominal strength in flexion. The straight leg sit-up is taken from Sahrmann's book and is an exercise that as Mike Boyle has said to me, and I paraphrase, a good way to train spinal flexion with minimal reps and spinal loading while still working hard. By taking an exercise that is tough to do we can work the abs while minimizing the spinal loading and reps performed.

7) Finally, I have been asked many times what the best exercise for achieving six-pack abs is, and as always I print them a copy of Mike Boyles article, The Truth about Abs. In this well-advised article he states that the best way to achieve six-pack abs is the Table Push away Diet where you should push yourself away from your plate of food. Diet is king to body composition change. Professionally advised Interval Training will also help speed fat loss.

**Summary:** Avoid thousands of crunches and any type of back extension where possible and try to work the core as it was meant to function. Lot's of front support, side support, chops, lifts, and anti-extension exercises with a healthy dose of full body compound exercises.

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*Dan rejoined the MBSC staff in November of 2007 after coaching in Winchester during the 2007 summer session. Prior to working at MBSC Dan interned with Mike Boyle and the Boston University Hockey Strength and Conditioning program for the 2006-2007 season. He graduated from Boston University with a degree in Exercise Science in 2007.*

*Working at BU and MBSC allowed Dan the opportunity to coach private training clients and athletes of all levels from beginner to elite. In addition, he has helped coach pee-wee and bantam hockey teams, as well as ice hockey goaltenders of all ages. Before BU Dan played junior hockey in western Canada for two years and then walked-on to the BU hockey team for the 2002-2003 season. He was also a White Water River Guide from 2002-2006 in eastern Tennessee.*

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