

# Newsletter

August 2010

## Down with sit-ups!

### Strong abs don't result from bending the spine

Jill Barker, Canwest News Service February 26, 2010

The reasons to stop doing sit-ups keep piling up. First, Stuart McGill, professor of spine biomechanics at the University of Waterloo, declared the sit-up more harmful than helpful. And now a study out of Youngstown State University in Ohio says sit-ups don't build strong abs.

The goal of the study was to find the most effective method to strengthen the rectus abdominus, the long flat muscle that runs from the sternum to the pubic bone and forms the much coveted "six-pack." Despite the fact that we have been doing sit-ups for years, there is a lack of definitive research stating the optimum training protocol necessary to maximize strength gains.

Some experts suggest that the abs, like any other muscle, benefit from an every-other-day training routine. Others maintain that a daily diet of sit-ups yields the best results. And then there is the question as to whether a traditional sit-up done without any added resistance (beyond body weight) provides the necessary training stimulus to strengthen the abs.

The Youngstown State University study, published in the October 2009 edition of the "Journal of Strength and Conditioning Research," separated 71 men and women into three groups. The control group did no sit-ups. The other two groups performed three sets of 20 repetitions (30 seconds rest between sets) of three distinct abs exercises for 11 weeks. Group One performed the sit-ups three times a week on non-consecutive days and Group 2 trained the abs six days per week. The ab exercises increased in difficulty every four weeks and speed was regulated by a metronome.

The results surprised even the researchers. None of the three groups of exercisers demonstrated any strength gains. Nor did they reduce their waist circumference or percentage of body fat.

"This finding suggests that training the abdominals with resistance levels short of fatigue is inadequate to produce strength gains and may be consistent with findings suggesting that pushing a muscle to repetition failure is more effective in producing strength gains," said the study authors, Jennifer Pinter, Ken Learman and Renee Rogers.

The authors did acknowledge that the exercise regime may have improved muscular endurance, but it was not measured in the study.

What does that mean for anyone who wants a stronger set of abs? The message is clear - sit-ups aren't going to get the job done. Muscles need to be sufficiently fatigued before they can build strength. That fatigue is notable only when the muscle has reached its repetition limit - at which point your abs are so fatigued that you can't perform even one more sit-up.

That being said, when it comes to well conditioned abs, strength may not be your ultimate goal. McGill suggests that building muscular endurance is more important than building muscular strength -- at least initially. Which means training the abs to work harder longer is better than developing strength without endurance. He also says that repeated bending of the spine (similar to the action that occurs during a sit up) increases the risk of back pain.

"Realize that the spinal disks can bend only so often before damage ensues," McGill said in a January 2010 article titled The Painful Lumbar Spine, published in the "IDEA Fitness Journal."

Then there is the issue of function. The primary role of the core muscles is to stabilize the torso, not perform the type of torso bending action found in a sit-up.

So, if curl ups don't strengthen the abs, don't train the core for everyday use and do more to provoke back pain than diminish it, why do them? McGill preaches improving stability, not mobility, and training all the muscles that surround the trunk, not just those that build a six pack. He also recommends a revamped curl-up that saves the spine while contributing to a core that is better able to withstand the demands of everyday life.

If you want a better-conditioned set of abs, substitute curl-ups for stability exercises like the plank or consider trying McGill's modified curl-up (see below). Time in the gym is too precious to waste it on exercises that fail to live up to their billing.

Stuart McGill's modified curl-up: Lie on your back with one leg straight and the other bent. Place both hands under the small of the back. Lift the shoulder blades off the floor (don't curl the spine), hold for a couple of seconds and return to the starting position.