

Thinking Man's Guide to Ab Training

by Ian King | Fri, Sep 22, 2000

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The Thinking Man's Guide to Ab training
Everything you always wanted to know
about abs but were afraid to ask
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Why do abdominal training?

There are a number of reasons why you should be doing abdominal exercises. They include:

Visual impact: Most people who are strength training are pursuing this goal. I'll leave out the "spot reducing" debate, assuming that it's been kicked to death, and say that there's potential for improved visual impact if the abs are kept in a shortened state through strength training.

Transfer to sport: The contribution of ab training to sports performance has received no shortage of press, but I suggest that many principles are misguided. For one, the statement that "a strong midsection is needed to transfer the force from the lower body to the upper body" is nice, but perhaps unsubstantiated.

Secondly, whether application of sports specific abdominal training has superiority over nonspecific abdominal training (combined with on-field specific training) is also unclear. Additionally, appropriate periodization from low level of difficulty to higher level of difficulty is often overlooked in the pursuit of immediate application of apparently specific exercises.

Injury prevention: This isn't a new concept. For example, Charles Mac Mahon was writing about the value of strong abdominals in injury prevention in 1931.⁽¹⁾ The exact role of the abs and other trunk stabilizers has received appropriate attention in therapy and injury prevention studies. This information has yet to fully filter down, however, based on the incidence of injuries that can be attributed to inappropriately prepared abdominal and trunk stabilizer muscles.

A place to store coins: Personally, I don't like carrying a change purse, so I find it much more convenient to store them in the deep furrows between my abs.

What have been the historical trends in abdominal training?

The historical emphasis may have been biased towards the performance of trunk flexion, which, for the sake of convenience, we'll call a dominantly "upper ab" exercise. Take for example a general strength circuit used by the US Marine Corps Physical Fitness Academy in the 1960s.(2) In a one exercise per major muscle group circuit, straight leg, anchored situps were chosen.

This isn't to suggest that there's been a lack of awareness of the multifunctional and multidirectional role of the abdominals. Bill Starr in his 1976 classic book, *The Strongest Shall Survive*, wrote that the abdominals "...can be strengthened in a wide variety of ways. Situps of all types, leg raises, and trunk rotation movements all involve the abdominal muscles to different degrees." Bill Pearl's 1986 classic *Keys to the Inner Universe* lists and graphically illustrates over 100 ab and trunk exercises! Despite all this info, there seems to be a gap in the knowledge and the actual practice. I still see exercise programs that select only one abdominal exercise, usually a trunk flexion movement. Would you use only one exercise to train your legs or your chest?

Frequency

How often should I train my abs?

Rather than getting caught up in a discussion as to whether abdominal muscles are phasic (power producing) or tonic (stabilizer contributing), I'm going to simply stress the inverse relationship between volume and intensity.

In other words, your abs need to recover too! If your primary concern is injury prevention, I lean towards more frequent, lower load (i.e., volume and intensity) exposures. For example, a total of 2 to 4 sets done five or six times a week. If your primary concern is performance specific power production, a higher load, less frequent exposure may be more effective, say on the order of 2 to 3 days per week. If your focus is injury prevention and visual contribution, a medium load and frequency may be effective, e.g., 3 to 4 days a week. (See Table 1 below)

Volume

How many sets should I do?

In his 1931 article Charles Mac Mahon wrote, "It is surprising, I might add, how little exercise is required to keep the muscles strong enough to prevent injuries."

I've also found this to be true. If injury prevention is your goal, 1 to 4 sets per workout may be sufficient. If your primary concern is to specific power production, a higher volume of say, 6 to 10 sets per session may be effective. If your focus is injury prevention and visual contribution, an intermediate volume of 3 to 6 sets per session may be more effective. Here's a summary:

Table 1

Abdominal training goal & recommendations for frequency and load.

Training Goal	Frequency per week	Load	Example
Injury Prevention	5-6 days	low	2-4 sets
Performance Specific	2-3 days	high	6-10 sets
General	3-4 days	med	3-6 sets

Intensity

How hard and heavy do I need to train?

We can treat the abs much like any other muscles. Going closer to muscle fatigue and failure will increase the fatigue curve. Only do this if you don't plan on training that abdominal muscle group for another 2 to 3 days. With regard to loading, the lower reps may have a greater training effect on the fast twitch muscle/motor units and the higher reps on the slow twitch muscle/motor units. I match the loading to the specific training goal:

Table 2

Generalization for load relative to specific training goal in abdominal exercises

Specific Training Goal	Reps	TUT (sec)
Control/Stability	10-30	40-100
General strength	10-20	40-70
Maximal strength (and visual impact)	5-15	10-40
Explosive power	5-15	10-40
Strength endurance	20-100	40-100

Isolation vs. Integration

Is it true that isolated exercises are best?

When sport scientists first analyzed the "unanchored" straight leg situp many decades ago, the conclusion was that the iliopsoas and other hip flexors were too involved. The concern here was inadequate stimulation of the other abdominal muscles and the injury potential of the anterior shear on the lumbar vertebrae.

Since those observations were made, there's been an out of control drive to find and exclusively use exercises with no hip flexor involvement. Well, guess what? Hip flexor involvement isn't all that bad! There's definitely an argument for strengthening the abdominals in isolation, but then the periodization of the ab training should consider a progression towards integration. Lack of exposure to compound movements (involvement of

more than one joint and muscle) can create a functional weakness in itself. The aerobic industry was one sector responsible for advancing the myth of isolation-only exercises.

Sequence

What stage of the workout should I train my abdominals?

The continuing dominant paradigm is that the abs should be trained last in the workout. But what if they're the weakest body part? Doesn't seem to matter to some "experts." What if they're the number one training focus for performance? Again it doesn't seem to matter — they're placed last. Why? The repetitive answer I get to this is, "They cause fatigue of stabilizers and it would be dangerous to do things like squats after doing abs."

Where's the evidence, empirical or research? Again, that doesn't seem to matter. *Nobody* does abdominals first! What a load of trash! The excuses support the paradigm, nothing more. I train abdominals first when they're the priority for whatever reason, and only put them at the end of the workout when I don't want to dilute substrate or emotional energy prior to a maximal strength workout. In other words, I wouldn't want the total body fatigue draining the neuromuscular system, thus reducing the potential for load. So there's an occasional reason to place ab training last in your workout, but it has nothing to do with preventing injuries!

Periodization

How should I periodize my abdominal training?

Generally speaking I like to commence a training career, year or block, with the mastering of the control/stability sub-quality (see Fig 1 below), and then over time phase along the sub-quality continuum to my end goal. This is simply moving from left to right along the strength sub-qualities continuum. If the sub-quality I want to peak on is one from earlier along the continuum, I return to it.



Fig 1 — The strength sub-qualities continuum.

Muscle Group Division

Is there more than one abdominal muscle?

I break the abdominal down into six muscle groups or functions. This may not be technically correct in the strictest sense, it's just a simple and effective approach to ensuring exposure to every "part" of the abs and other trunk stabilizers.

1. "Lower" abdominal e.g. hip flexion
2. "Upper" abdominal e.g. trunk flexion
3. Lateral flexion e.g. side bends
4. Rotation e.g. Russian Twists

5. Co-contraction of abdominal and gluteal

6. Integration of total trunk stability

Muscle Sub-Group Allocation

Which of the above 6 sub-groups do I train on which days?

If you're training with a day or more rest between sessions, you can afford to do all six sub-groups within one training session. You don't have to, but you can. If you're training two or more days in a row with no day off, then I recommend you don't train all six in the one session. I might allocate abdominal muscle sub-groups in the following way in a four day split :

A	B	C	D
Lower abs	Upper abs	Lower abs	Upper abs
Lateral flexion	Rotation	Lateral flexion	Rotation
Co-contraction Integration		Co-contraction Integration	

Sequence of Abdominal Sub-Groups

Which muscle sub-group do I work first?

I apply the priority sequence rule: I find out the weakest to strongest generally speaking, and do them in that order. This is why most programs might have the lower abs receiving a higher sequencing in the training week than the upper abs. Many people have stronger upper abdominal function from a training history biased towards this movement.

Common Faults In Program Design

What are the ones I see most?

The most common faults I see in abdominal program design include :

- No abdominal training at all!
- No assessment of weakness/strength or attempts to determine the sequence by priority of need.
- Focus in sequencing and volume on strength, not weakness.
- Use of inappropriately high level of difficulty exercise, e.g. a person with zero lower abdominal control trying to perform straight leg raises hanging from a chinning bar!

Some Exercise Examples

Lower Abs: "Thin Tummy"

Perhaps the most popular hip flexion (lower ab) exercise is the knee-up drill, done either with a low pulley or on an incline (or at the extreme end, vertically i.e. hanging from a chinning bar.) I see little value in doing any ab exercise that exceeds your ability to selectively recruit the desired muscle groups in the desired joint positions.

Hip flexion drills deserve this conservative "selective recruitment" approach the most of all the six categories because of the direct potential involvement of the hip flexors. Stresses on the lower back are greatest in these drills as well.

My preference is to master a drill I call "thin tummy". I've seen this drill done in the kneeling position, but I have a preference for doing it on your back, knees bent to 90 degrees, feet flat.

Place your little finger in the groove between your thigh and trunk, underneath the belt line. Have your thumbs on your upper tummy. First, suck your tummy inwards, making your abdominal circumference as thin as you can (just imagine you are on the beach and a good looking gal walks by!). Then attempt to recruit the abdominal muscles under your little fingers, i.e., the "lower abdominals." Minimize or avoid upper abdominal contraction and definitely no bulging of the upper tummy. You must maintain that "thin dish." Initially you may struggle to even find the muscles I want you to contract! Work with five second holds, 10 reps a set. The next step is to be able to breath normally during the isometric contractions!



The thin tummy drill is the cornerstone I build my abdominal programs upon, so yes, I believe it should be mastered first and foremost. (If you're still a bit confused about this drill, you may want to check out my video series *How To Teach Strength Training* which covers over 100 exercises in detail including the thin tummy. You can find them [here](#).)

Upper Abs: Slow Up / Slow Down

Perhaps the most popular abdominal drill for the upper abs or trunk flexion is a variation of the situp while holding a weight plate on the chest. My base exercise for this abdominal category is what I call the "slow up/slow down."

Lie on the ground with your knees bent to 90 degrees, feet flat, hands parallel to the ground by your side. Then sit up slowly, taking five seconds to come up fully. This phase should be performed using a constant speed (i.e., no acceleration) and in the absence of momentum from other body parts, which is one of the reasons I ask the arms to remain straight and parallel to the ground during the situp. Then take five seconds to lower back down, again with no change in speed of movement.



Rotation: Russian Twist

Rotational movements are more commonly seen in bodybuilding or sports training. This rotation can involve either the trunk or the legs. The traditional movement in bodybuilding has been the old "sit on a bench with a broomstick and rotate." Anyone who hasn't seen this done is really showing their youth! Criticized for the lack of external resistance to overcome and then the potential for jamming up the lower vertebra, other alternatives have become more popular.

Arguably the Russian Twist is the most popular trunk rotation drill. Sit on the ground with knees bent to 90 degrees and lean your trunk back to 45 degrees. Keeping this trunk angle, and with arms out straight, fingers interlocked and arms maintained at 90 degrees to the upper body, rotate the trunk from the waist (not the shoulders!) To increase the level of difficulty I like to use a concurrent alternate leg cycle (so that the legs never touch the ground).



Of course, you can add an external load (weight plate or medicine ball) to the hands, but I don't feel this is necessary when the drill is performed in a controlled fashion at a 202 tempo* and later down the sequence of abdominal drills. Remember, rotation drills for the lower body can be performed in addition to, or instead of, upper body rotational drills.

Lateral Flexion: Side Raises on the Ground

Lateral flexion drills are less commonly witnessed in the gym, but the most popular ones are side raises off the end of the Roman Chair (or bench) and standing low pulley or single dumbbell lateral trunk bends. I think the lateral trunk flexion off the end of a bench is the king of these exercises, especially when you add a twist. But for starters, I like to use the simple, controlled drill of side raises on the ground.

Lie on your back, bending both knees to 90 degrees. Then, keeping the knees together, roll them to one side so that the outside of the lower knee is in contact with the ground. Touch the forehead with the fingers of each arm and have the elbows motionless at 45 degrees from the head. Take 2 to 3 seconds to flex or sit up as far as you can, which won't be far! Pause for a second at the top, then lower down in 2 to 3 seconds.



Do 10 to 30 reps on one side before repeating the same on the other side. This is nowhere near as demanding as the side raises off the end of a bench, but if you sequence this drill towards the end of your ab workout and use a strict technique it will certainly do the job!

Co-Constrictions: Seated Cheek-Abdom Squeezes

These fall into the "co-contraction of the abdominals and gluteals" category and have a greater application to those interested in performance and injury prevention. There's no traditional movement of this kind that I'm aware of.

Sit on a bench, knees together. Contract the lower abs and gluteals, attempting to "levitate" up from the bench as high as you can. Hold this for 5 seconds, repeated 5 to 15 times. Try to breathe normally during the isometric contraction! You can have your fingers placed on the lower/outer abdominals during this to act as biofeedback devices.



This isn't a drill that will create a lot of pain or discomfort as you do it. The value is significant, but subtle.

Integration: Integrated Trunk Drills

Many of the above exercises use more than one group of muscles. This category's goal is to involve them all. Many of the drills on the Swiss ball fall within this category, but I'll give you a simple drill requiring no equipment.

Go into a push-up position on the ground. Keeping the body totally flat (parallel to the ground), raise one arm up. Ideally raise it to parallel to the ground in front of you, taking 5 seconds from take off to landing. Bring the first arm down, then do the same with the other arm. Now try 5 second holds with one leg up, then the other. Lastly, raise the opposite arm and leg at the same time.





By the end of the sequence, you'll have performed a total of six 5-second reps. You may wish to repeat this cycle one or more times. Remember to keep the body flat, not allowing the hips to sag down. If a push-up position is more than you can handle, work off the knees.

Closing

There you have it: A complete guide to ab training based on your specific needs and goals. All you need to is look at the tables provided, decide what your training goals are, choose a few exercises from each category, and go to work. Combine this with a good diet and maybe you won't have to suck in on the beach anymore!

*Please check our **FAQ** section if you're not familiar with tempo prescriptions.

References:

1. Everyone has a weak spot physically, *Correct Eating -- Strength, Vol. XVI(6)*, p. 38-40.
2. Rasch, P.J. 1966, *Weight Training*, Wm C Brown Co Publishers, Iowa.

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