

# Articles

## Back to the Future of Abdominal Training

Paul Chek

Today's world is ab crazy! Book stores are loaded with exercise books promising to flatten your abs, countless TV infomercials are selling hundreds of abdominal conditioning gimmicks guaranteeing "rock-hard" abs and every fitness magazine available has a monthly article focusing on ab training. People going to gyms apparently weren't getting enough abdominal results from aerobics and sculpt classes so they invented "Ab Blast" classes; classes designed to torture your abs, and only your abs, for thirty minutes or more! As if that weren't enough, there are companies trying to convince you that with the application of a special cream or use of an electrical gadget, you will flatten your abs in just a few minutes a day performing less work than ever!

Is all this necessary or even worth the time, money and effort? More importantly, does all this abdominal blasting have anything to do with improving performance in a functional environment (See article [What Is Functional Exercise?](#))? To answer these questions, we must look at the role the abdominal musculature played in ensuring man's survival while under selective evolutionary pressures.

### DID CAVE MEN DO SITUPS?

Imagine primal man out on a hunt. He has been hunting for hours but, having no luck, decided to hit the dirt and knock out a few crunches to keep the abs looking good for the primal babes (Figure 1). Does this scenario seem very likely? I don't think so!

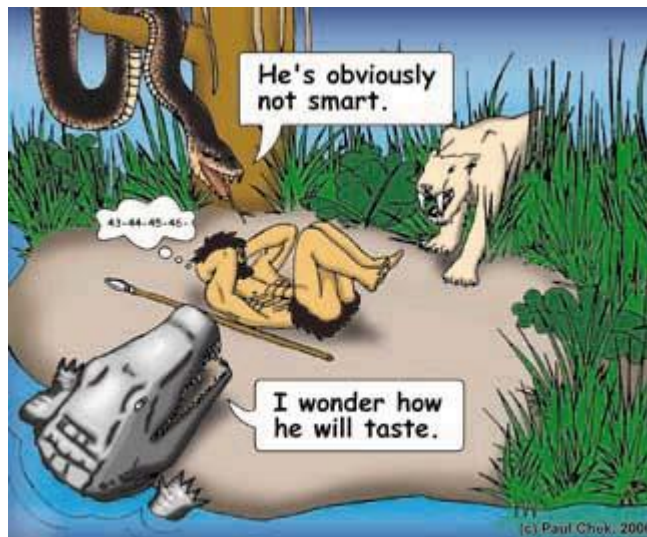


Figure 1

The actions of the abdominal wall are quite complex indeed. It is common for us to think of the abdominals as muscles whose primary function is the aesthetics they provide in front of a mirror. This sort of thinking is analogous to thinking that a car is a box on wheels, the sun is merely a light source for earth, or that having a headache is an indication of an Aspirin deficiency! To appreciate both the complexity and capacity of the abdominal wall, we need to briefly look at how the abdominal muscles are innervated.

## INNERVATION OF THE ABDOMINAL WALL

The abdominal muscle group receives innervation from every segment of the spinal cord from T-5 all the way to L-1 (Figure 2). Now, to give you a perspective on the significance of this, most muscles in the body have only two sources of innervation - one primary and one secondary. For example, the deltoid is primarily innervated by C5 with secondary innervation by C6. This knowledge allows doctors and therapists to assess neurological function by testing specific muscles innervated predominantly by one segment. For example, the deltoid is commonly tested to assess the C5 nerve function.

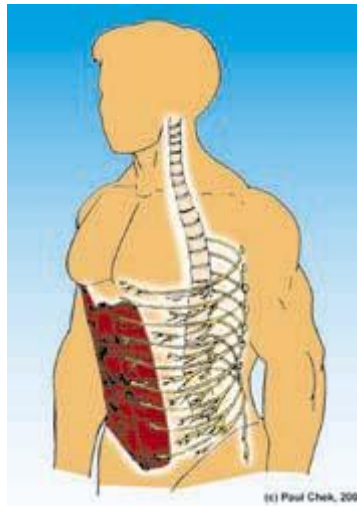


Figure 2  
Each section of our spinal cord receives and sends information, acting as a brain and controlling each of the muscles it innervates.

This is such an important distinction to make because each nerve is a branch from a specific segment of the spinal cord. There, motor cells stimulate the nerve which then stimulates the muscles it feeds. The nerve cells in the spinal cord are stimulated by motor cells in the brain, which acts like the conductor of an orchestra (Figure 3).



Figure 3

The throwing arm and opposite lead leg are drawn closer to one another by coordinated contraction of the Anterior Oblique System. Primal men who had a better developed and more finely coordinated system stood a greater chance of survival than someone with a less functional Anterior Oblique System.

Each section of the spinal cord acts like a brain with the respective nerve delivering it's message to the muscle and specific muscle fiber it feeds. Therefore, considering that the abdominals have nine innervations per side coming from nine different spinal segments (brains), the abdominal muscles could be considered as having nine spinal brains directing and controlling them. Think of all the tasks you could carry out if you actually had nine brains in your head!

When one considers all the vital functions provided by the abdominal wall, including joint stability, visceral (organ) support, respiratory support, circulatory/immune system support and digestion/elimination system support, the necessity of such intricate innervation becomes obvious.

Although I will expand on each of these issues in my upcoming book "Flatten Your Abs Forever! - Secrets Of Abdominal Training", what I would like to show you today is a retrospective analysis of man's evolution as rationale for how we should train our abdominals. It will become blatantly obvious that, with the exception of specific rehabilitative attempts to isolate weak upper abdominal muscles, base conditioning programs focusing specifically on hypertrophy of the abdominal wall, or purely aesthetic conditioning, crunches, sit-ups and similar isolation tactics are relatively useless for improving abdominal function and performance!

## **BACK TO THE FUTURE OF ABDOMINAL TRAINING**

Who we are today, is an expression of what our ancestors were a long time ago. Scientists have strong evidence that our direct ancestors, Homo erectus, began to inhabit the planet about 1.6 million years ago (1).

An interesting and somewhat controversial scientific supposition is that it takes 100,000 years for 0.001 percent of the genome to change (2). Therefore, using this information, it can be stated that our bodies are almost identical to our ancestors roaming the planet over 100,000 years ago. Correlating with this genetic information, researchers state that Homo sapiens, better known as modern man, appeared in South Africa around 100,000 BC, and within the next 70,000 years had replaced all the previous species of hominid throughout the entire globe (1).

During the majority of the past 100,000 years, we existed as hunter-gatherers, surviving on available meat and plant life. Scientists suspect that our ancestors (Homo habilis) developed a taste for meat as far back as 2.3 million BC. Meat was not only preferable in terms of flavor, but nutrition as well. Two pounds of venison, for instance, provides almost six times as many calories as the same weight in berries or green vegetables (1).

With that in mind, it is safe to assume that when ever possible, man favored hunting for meats over foraging and harvesting berries and vegetables (Figure 4). Throwing rocks, using clubs and throwing spears were all methods of choice for killing meat sources that, for the most part were much bigger and faster than man, not to mention protecting oneself. To accelerate a spear adequately enough to penetrate and sufficiently wound the hunted prey required a well coordinated effort between the deep abdominal wall to stabilize the necessary joints and the larger outer unit muscles working to accelerate the spear (Figure 5).

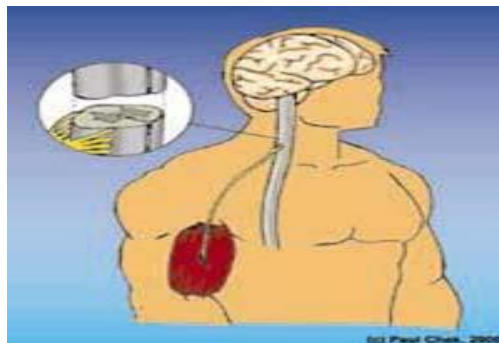


Figure 4

You can see that the tension of the musculoskeletal "sling" between the opposite shoulder and hip creates a powerful pulling mechanism in the body.

As you can see in Figure 5, the musculature of the anterior oblique system work together producing a synergistic action between the lead leg, torso, and opposite shoulder and arm. This is important to note because in most functional activities there are necessary requirements for the same degree of synergy. My question is, can this synergy be maintained and developed with the abdominal exercises primarily used in gyms and athletic training programs today?



Figure 5

Once a primal hunter downed an animal, it is doubtful he could convince it to follow him home! He most likely had to pull the animal to a suitable location (Figure 6) to gain adequate leverage and get it on his back (atop of a log for example) or he had to share the load with fellow hunters. If that didn't work, he would have cut it into sections small enough to pack and bring home. Quite a tough job with a piece of sharpened flint or a sharpened antler!



Figure 6

The Anterior and Posterior Oblique Systems represent a complex network of musculofascial integration designed to allow primal man to meet the demands of daily life with minimal energy expenditure. These systems were essential to the survival of primal man.

During the action of pulling, the posterior oblique system (Figure 7) serves as the agonist or prime mover for the majority of the pulling force (3,4). Because it is often more natural to pull with greater force from one arm to move heavy and/or awkward objects, a rotational torque would have been placed on the hunter's body. The abdominals contributed to the combined actions of pulling and trunk rotation, and as antagonists (stabilizers) for the prime mover muscles of the posterior oblique system.



Figure 7

The Lateral System provides essential frontal plane stability (left-to-right) allowing primal man to ambulate while reducing the risk of back, knee, hip and ankle injury.

To get an animal home, the hunter had to hoist it onto his back (Figure 8). This would have required a bend pattern, from which he may have used a power clean type movement to get the deer in to a comfortable carrying position. During the bend pattern, the deep abdominal muscles (inner unit) play a vital stabilization role, providing segmental stabilization for the pelvis, thoraco-lumbar fascia and spinal column. There is also a production of intra-abdominal pressure, which via the tendons of the diaphragm, may decompress the lower lumbar segments (5, 6). The outer unit muscle systems will serve to provide gross stability and helps to prevent the hunter from losing his balance during this lifting task.



Figure 8

Getting the animal home would have required that the hunter trek back along trails and through the bush using a combination of the gait pattern (walking), high stepping and lunging. During the trek, the anterior oblique (Figure 9-A) and posterior oblique (Figure 9-B) systems would have been intimately involved in producing an efficient gait pattern. To appreciate the contribution of the oblique systems, Gracovetsky (3) identified the increased demand on the abdominals while running in sand. Because the ground was not as paved and perfect as it often is today, the primal hunter would have needed fully functional abdominals to handle the challenging terrain while ambulating through the wild, particularly with a load on his back.



Figure 9-A

Figure 9-B

During his trek through rough terrain carrying a heavy load, the primal hunter would have encountered numerous obstacles including large rocks and logs. Traversing across these objects required the hunter use a lunge pattern (Figure 10). As many of you are aware, performing a loaded, dynamic lunge requires significant stabilization from your abdominals, not to mention the added work associated with acceleration and deceleration of the load atop the hunter's body while traveling over unpredictable terrain. This constitutes real abdominal training!

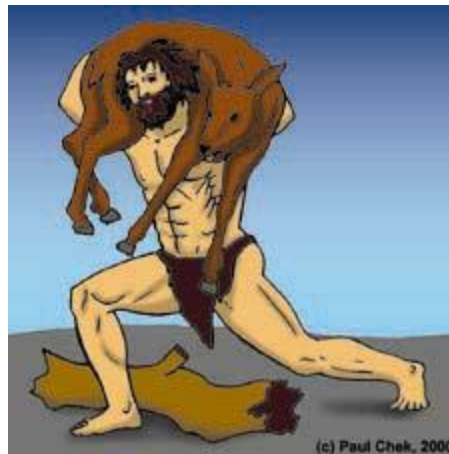


Figure 10

Now that you can appreciate what it would have taken for the primal hunter to get his prey home (walking, lunging, climbing), you can understand that a system of muscular actions designed to support and move the body laterally would be mandatory. That system is called the lateral system (Figure 11).



Figure 11

Upon returning home with his kill, there was a threat that he would have to fight to protect his food from less fortunate hunters. Such combative situations would have required the use of a primal push pattern (Figure 12). Such combative interactions would have required full and synergistic activation of the anterior, posterior and oblique systems . . . more good abdominal training!



Figure 12

Aside from the duties of feeding and protecting his family, primal man had to work with family members to build and maintain their shelter. As demonstrated in Figure 13, there would have been countless opportunities to use the primal squat pattern, particularly the more functional front-loaded squat pattern, requiring functional stabilization from the abdominal muscles.

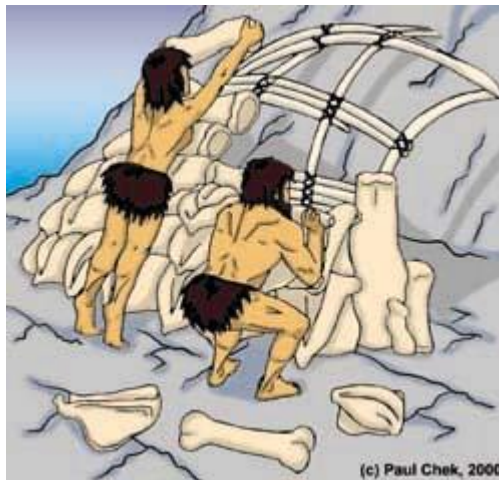


Figure 13

## **OUT OF THE PAST AND INTO THE FUTURE OF ABDOMINAL TRAINING**

Today, there are many debates regarding how the nervous system stores and accesses movement information, otherwise known as motor programs. One contention is that the brain is not large enough or fast enough to store the billions of movements that we perform in a lifetime, nor can it create new movement patterns at real-time speeds of movement.



Of the numerous proposed theories, Schmidt's theory of generalized motor programs (6) has always correlated my own clinical observations. Schmidt proposed that the brain stores key movements with a relative timing sequence that allows them to be easily modified to become other movements both in velocity and amplitude. For example, there have been numerous research studies that have proven squatting improves vertical jump performance far more than leg presses, knee extensions and leg curls.

The reason the squat is superior to any form of isolation or machine training is because the relative timing (rate at which body segments move relative to one another) is similar. This means that when you improve squat strength, you are developing strength in a sequence that the brain can immediately apply to similar movements, such as the vertical jump, because it shares a similar relative timing sequence.

Using my clinical observations and correlating them with motor learning research, I have developed a system of exercise based on the movements I felt were necessary for survival in our developmental and primal environment. I call this system the "Primal Pattern™" system (7).

I've proposed that any primal man or woman who could not perform any of the primal patterns (squat, lunge, bend, push, pull, twist and gait) from a standing position, would have perished. Based on countless clinical examples of people that were not successful with the traditional approach to conditioning or rehabilitation, I have found that their ability to perform one or more of these Primal Patterns? was notably deficient and/or dysfunctional.

I have surmised that most all sports or work activities can be broken down to any single Primal Pattern? or combination of primal patterns. Appreciating the essential role of the abdominal wall as a key stabilizer mechanism and literally the "core" of most movements, I have found that abdominal conditioning using Primal Pattern? movements is critical to long term athletic success and injury prevention!

Most interestingly, one need only look back in the literature to find that abdominal isolation exercises such as the crunch are relatively new. They are exorbitantly new in terms of the evolutionary development of our nervous systems! In fact, the US Army's "Manual of Physical Training," published in 1914, is a 335 page book, chalk full of exercises to train soldiers. Take a guess how many sit-ups, sit-up variations, crunches or such abdominal isolation exercises were presented in this thorough manual of physical conditioning? If you said "0", you are correct! There were however, multitudes of Primal Pattern? movements found on page after page of this manual!

Examples of functional abdominal training, the kind that gives you a "six pack that works," are the Single Arm Cable Pull (Figure 14), the Single Arm Cable Push (Figure 15), the Wood Chop (Figure 16), and any of the other Primal Pattern? movements. These exercises all meet the requirements of functional exercise based on the guidelines used here at the C.H.E.K Institute and serve, not only to improve one's abdominal aesthetics, but when executed correctly they will train and maintain optimal motor skills in the body.



Figure 14

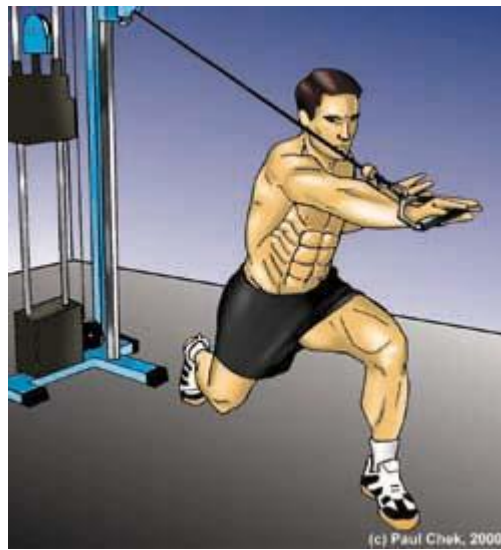


Figure 15

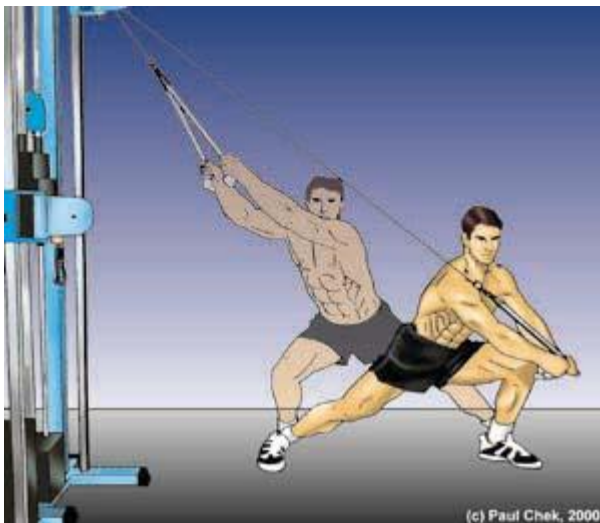


Figure 16

**TRAINING FOR THE GOLD AND A SPOT ON THE PODIUM!**

After all this, I am not saying that abdominal isolation exercises are useless. What I am saying is that they are only training the body to be strong at the particular movement of that exercise. Doing crunches makes you strong at crunches, but does nothing to improve your ability to swing a golf club, bat or hockey stick!

Aside from rehabilitative settings, first phase base conditioning and bodybuilding competitions where isolation and hypertrophy are necessary to achieve a specific objective, Primal Pattern? training can be considered as real abdominal training! As outlined in Figure 17, the way to the podium is through a careful and intelligent progression of abdominal or "core" training. The ultimate goal of any exercise, aside from the benefit of improved strength, is to develop automaticity. This is the ability to produce movements, or their approximations, with optimal form and at real-time speeds without having to think about it. After all, if you have to think about how you are moving, your brain will not be free to concentrate on how to win the game!



Figure 17  
References

1. Constable, George. TimeFrame: The Human Dawn. Alexandria, VA: Time-Life Books, 1990.
2. Sibley CG, Ahlquist JE. 1984. The phylogeny of the hominoid primates as indicated by DNA-DNA hybridization. *J Mol Evol* 20: 22-25.
3. Vleeming A, Mooney V, Snijders C, et al. *Movement, Stability and Low Back Pain: The Essential Role of the Pelvis*. New York: Churchill Livingstone, 1997.
4. Lee, D. *The Pelvic Girdle (2nd. Ed.) - An Approach to the Examination and Treatment of the Lumbo-Pelvic-Hip Region*. Edinburgh, London, New York, Philadelphia, Sydney, Toronto: Churchill Livingstone, 1999.
5. Chek, P. "How to Be Back Strong and Beltless." *Testosterone Web Magazine*. URL: <http://www.t-mag.com> (Sept. 8, 2000).
6. Chek, P. 1999. *The Inner Unit - A Frontier in Abdominal Training*. *The IAAF Technical Quarterly*. Vol. 14, pg. 27-34.
7. Schmidt, R.A. *Motor Learning & Performance: From Principles to Practice*. Champaign, IL: Human Kinetics, 1992.
8. Chek, P. *Advanced Program Design*, correspondence course and video cassette series. Encinitas, CA: A C.H.E.K Institute publication and production, 1997, 1999.
9. Bompa, T.O. *Theory and Methodology of Training*. Iowa: Kendall-Hunt, Dubuque, 1983.