the CrossFit JOURNAL ARTICLES

KingKinggg KongKonggg

A CrossFitting strongman thought a King Kong video was so mind-blowingly nice that he just had to do it twice.

Rob Orlando

WMV

MOV

Wednesday morning, October 15th, I woke up, checked my email, and then made the second stop of the day: CrossFit.com. It's a ritual that is years old, but today was different. The video for the day was of a man, a large man, doing a workout called "King Kong." Right away I knew this had to be something different. You don't call your workout "King Kong" unless you mean business, right?

I clicked on the video and watched "Big O" perform 1 deadlift at 455, 2 muscle ups, 3 power cleans at 250, and 4 handstand pushups for 3 rounds. It took him 7:37. Impressive no doubt. But at the end of the video a tag ran across the screen that read, "Anyone else care to try?" The trap was set and I took the bait.

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My CrossFit journey started years ago when a client of mine turned me on to the site. My ritual of checking the site to see the latest concoction was immediate. One of the things that turned me on most about CrossFit was the competitive spirit that seemed to ooze from its participants. These people took fitness to a new level and they turned it into a sport with scores, winners, losers, and stats. Case in point: the first video I saw was Annie and Greg doing "Fran" and I thought, "How hard could that be?" I'm not the first or the last to think that, by the way. The following day I was in my basement working out and decided to perform "Fran" with 135 pounds instead of the prescribed weight of 95 pounds. It took me about 6 minutes to finish the workout. It took me an hour to pry myself off of the floor and stop wheezing like an asthmatic squirrel. I was hooked.

Although I checked the site each day for workout ideas, I didn't fully embrace CrossFit until the last 6 months. My sport was competitive strongman so, foolishly, I refrained from doing any of the WOD's that contained cardio. I also refrained from doing almost anything that would take my time past 2 or 3 minutes of work because strongman events are never more than 90 seconds long. My single rep strength was good and my conditioning mediocre at best but I was still competitive and placing in the top 3 in most of the shows that I entered.

It all changed when I opened up my own gym in Stamford, CT in May of 2008. I would post workouts on the board and clients would inevitably ask, "How fast do you do this?" The response usually was embarrassing because I didn't train myself the way I trained my clients. Wanting to be the example, I started training like a beast. CrossFit programming with strongman equipment. It made perfect sense to me and the changes to my performance were immediate. My "Fran" time went from 4:30 to 2:48. My "3 Bars of Death" time went from 50+ minutes to 23. What I found most interesting was the very small drop on my "Total" from 1294 to 1274. Those gains took place while I lost 30 pounds of excess body fat. (My weight is now 200 pounds).

"King Kong" lit a fire similar to Greg and Annie doing "Fran." I had to try it and I actually lost sleep between Wednesday night and Thursday morning. Thursday afternoon I got a text message from my partner Stefanie Tropea that read, "Is that King Kong thing still making you mental?" The answer was most definitely. I was torn because I had done the "Total" on Tuesday and I wasn't sure how my body would respond to the deadlift and cleans in Kong. I knew that I could do it faster than 7:37 but my partner challenged me to do as many rounds as possible in 7:37. I took it one step further and decided to double the work to 6 rounds and try to finish under "Big O's" time.

Thursday night, after running a mile at 7pm with a group of hockey player clients, the gym was empty and quiet. No music, no distractions, no cheerleaders.....just me and King Kong. This would be a test run to see how fast I could complete Kong as prescribed. 3...2...1...GO!! I charged through the first round in less than 45 seconds, but on the second round, I got too far back on my heels during the catch on one of the cleans and fell flat on my ass. That cost me at least 10 seconds. After the fall, it went smoothly and I finished in a decent 3:01.

Feeling good about my score, I decided that I would try again in a week or so. Monday, October 20th, I was in the gym alone around mid-day. After watching Coach Burgener work with Dutch and Nick Hawkes, I began my oly workout. First the snatch. I performed a bunch of sets and never quite got into a rhythm. After 25 minutes of trying to get something going and failing, I threw in the proverbial towel. I was so distracted by the question mark of Kong that I loaded the bars and said, "Screw it." I don't need to wait another minute.....it's on!

3...2...1...GO!! I flew through the first 3 rounds in 2:45 and then settled in for the hard part: rounds 4, 5, and 6. My lungs burned going into round 5 and my stomach started to churn when I got into the cleans on round 6 but I thought, "Work now, rest later." The cleans were done and the last 4 reps of HSPU were a cake walk compared to everything else. Kong had been slain but how long did it take? I didn't have anyone to pace me so I had to watch the video back and time it that way. After watching the video I decided that my 7:15 score was good but could have been faster if I had spent less time panting like a race horse and chalking up. It's possible to do in less than 7 minutes and someday I will try again.

There is no doubt that someone in the CrossFit community will shatter that time. That's the beauty of CrossFit: the competition drives the machine. Someone will see my video and think, "I can crush that." Then it will be their turn to lose sleep wondering what the outcome will be when they make their attempt.

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Rob Orlando runs Hybrid Athletics in Stamford, CT. WEB

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Muscle Damage and Soreness: An Overview

Tony Webster

You need a little soreness—it means you're adapting, getting stronger. But too much means you're risking injury or overtraining. Here's why.

From my interactions with other CrossFitters, I've found that muscle soreness seems to be treated like the stereotypical mother-in-law. You're not really sure if you like her or not (or maybe you're very sure that you don't like her!) but you accept that she's part of the deal, she'll keep coming back, and you just find a way to deal with her until she goes home. As CrossFitters we understand the meaning of *real* muscle soreness. The kind of soreness that makes you hobble out of bed in the morning and clutch at handrails when walking down stairs. It seems as though it is almost a rite of passage in this sport. But have you ever stopped to think about why you are getting sore? Why do some workouts cause severe muscle soreness and others not? What could one do to prevent or reduce it? If these thoughts have crossed your mind at some point, read on.

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Technically, the kind of soreness we are referring to is called "delayed onset muscle soreness" (DOMS) in the scientific literature to distinguish it from more "immediate" soreness that might be experienced as a result of injury. There is a lot of SB (or *silly bullshit,* to use a Rip expression) swirling around the topic of DOMS in the fitness industry. For example, it is often taught by fitness experts, and even by many sport coaches, that muscle soreness is a sign of having "overdone" it, to be avoided where possible. It is also taught that lactic acid is the cause of soreness and that post- exercise static stretching will reduce or eliminate DOMS. More on these points later. For many specialized athletes, muscle soreness tends to be an issue only after prolonged layoffs from their sport or after training sessions that have been unusually tough or substantially different from normal. In CrossFit, of course, there is no "normal," just constantly varied functional movements performed at high intensity: the perfect recipe, as it turns out, for ongoing muscle damage and soreness.

Mechanisms of muscle damage: Eccentric overload

For something so commonly experienced by us all, you may be surprised to know that the exact mechanisms of muscle damage and the cause of the subsequent soreness are still unclear. It has been, and still is, a source of quite active debate amongst muscle physiologists. There are essentially two hypotheses for what initiates muscle damage in the first place: a "metabolic" hypothesis and a "mechanical" hypothesis.

The "metabolic" hypothesis, predominant for many years, states that muscle damage is caused by metabolic deficiencies or excesses. It was believed that lactic acid (generated during high intensity exercise) was the cause of muscle soreness. While it is fair to say that muscle burn or discomfort during high intensity exercise has been linked to lactic acid, there is no evidence to suggest that this is in any way linked to subsequent muscle damage or soreness. Therefore this idea has been disproved (I will elaborate on this point a little more below).

While there are undoubtedly many metabolic consequences of muscle damage, most in the scientific community now agree that its initial cause is mechanical in nature.

The "mechanical" hypothesis points to *eccentric* actions of muscles as the main cause of muscle damage. What are eccentric actions? Well, there are essentially three types of muscle action (note I am using the word action as opposed to contraction – read on to find out why). There are *concentric* muscle actions where a muscle shortens when it generates tension, a true "contraction." This usually refers to the actual lifting phase or acceleration phase of any movement: think of the "up" phase in a squat or shoulder press for example – muscles are shortening and the weight is lifted. There are *isometric* actions when muscles generate tension but there is no change in length: think about holding a handstand position or attempting a deadlift which is simply too heavy for you to move – lots of muscle tension but no movement. And there are *eccentric* muscle actions usually associated with the lowering phase or deceleration phase of any movement. During an eccentric muscle action there is tension in the muscle but it is actively lengthening at the same time. The "down" phases of a squat or shoulder press are examples. It turns out that eccentric actions are structurally much more stressful for muscle fibers than any other form of muscle action. The exact reason

why is unclear, but it appears that during eccentric actions the weak links in the microstructure of the muscle fibers are more likely to "pop" or "tear" than during other forms of muscle action. This can actually be seen in the muscle fibers under a microscope. At very high magnification, there is a characteristic array of regularly repeating bands (Figure A) within healthy muscle fibers. After severe eccentric exercise these bands can be seen to be disrupted (Figure B).

Figure A
Electron micrograph showing the normal arrangement of muscle proteins. Note the regularly repeating bands called Z discs.

Figure B
In this micrograph after eccentric exercise, note that the bands are now disrupted. This is called Z disc streaming.

I return for a second here to the old metabolic theory that suggested lactic acid caused muscle damage: The interesting aspect of eccentric muscle actions is that they are *metabolically* less stressful than concentric muscle actions. In other words, they generate less metabolic by-products such as lactic acid than concentric actions, yet they still manage to cause more damage and soreness. This has been a convincing line of argument which helped to disprove the metabolic theory.

It is important to understand that eccentric actions are a key ingredient in order for muscles to adapt effectively to a strength or power training program. These are the actions that break down the muscle to a greater degree, thus stimulating greater eventual repair and adaptation. In comparison, concentric actions just do not have the same anabolic effect. Studies have shown that muscles loaded with only concentric contractions fail to respond to a strength training program to the same degree (in both strength and size) as muscles that are exposed to both concentric *and* eccentric actions. In the CrossFit FAQs Greg Glassman estimates that CrossFitting will build greater mass than bodybuilding, assuming that both are done clean (without steroids). He attributes this to the greater neuro-endocrine response elicited by CrossFit workouts. I would suggest that the major emphasis on fast, full range of motion multi-joint movements, and the associated eccentric muscular breakdown and repair could also be an important contributor.

Consequences of muscle damage: Temporary swelling and pain, lower power and range of motion, and tremor

The main consequence of muscle damage that we all feel is DOMS. This is soreness that first appears about eight hours after the exercise bout and typically peaks about 24-48 hours later. It's particularly noticeable when you get out of bed in the morning. We experience muscle tenderness, pain when we touch the muscle, and stiffness that causes pain when we move or stretch it. With some gentle movement the pain usually subsides, but after prolonged periods of little movement (sitting in front of a computer, for example) it rears its ugly head again. Usually the DOMS will have mostly disappeared after about four to five days, but can persist for longer in some cases, as most CrossFitters can tell you.

So why do we get sore? It seems reasonable to speculate that it evolved as a way to tell us to "ease off" while the muscle is recovering. To repair the microdamage to the muscle fibers the body initiates a local inflammatory response that starts the healing process. As we all

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know, inflammation is usually accompanied by pain, swelling, and redness. Since the inflammation is inside the muscles themselves, we can't see the redness (increased blood flow) or the swelling, but we can sure feel the pain! So you might be thinking, "Maybe I should just pop an anti-inflammatory?" Well, not so fast – we'll discuss that later.

In addition to soreness there are a number of other things that happen as a result of muscle damage. In most cases after muscle damage, the membranes of muscle fibers are compromised, allowing substances to spill out into the bloodstream. These include muscle proteins like creatine kinase and myoglobin, and certain electrolytes such as potassium. In the vast majority of cases, these effects are entirely normal and reversible, but in very rare cases the spillage is excessive and can lead to serious medical complications. This is the exertional rhabdomyolysis that many have heard of. In severe cases, "rhabdo" can lead to cardiac arrhythmias (due to blood electrolyte imbalances) and/or potential kidney failure (when the muscle proteins accumulate in the kidneys and prevent them from filtering the blood normally). If your urine looks like Coca Cola in the hours or days after a hard workout, this may be a sign of rhabdo (go to the ER immediately!). Rhabdo has been covered eloquently in previous issues of the CFJ by Eugene Allen (#33) and Greg Glassman (#38), so I will say little more on this topic. The key to avoiding rhabdo is judicious and gradual introduction to intensity for athletes who are unaccustomed to training that involves significant eccentric muscular stress.

Further consequences of muscle damage include loss of muscle function – the muscle does not recover its strength and power capabilities for at least several days after the exercise bout. One may assume that the muscle is fully recovered when the soreness has disappeared, but the time course of soreness and strength loss is not as closely linked as one might think. The muscle may feel fine but may not recover its full force capability for a few more days. Loss of muscle function in the days after a hard muscle workout can also be seen in the form of shortened (contracted) muscles at rest and an inability to contract fully. In other words, the range of motion through which the muscle can effectively operate is significantly reduced while it is recovering. Studies have also shown that during recovery from muscular overload there are significant changes in our gait biomechanics, and that there are significant decrements in sprint and endurance performance. There is also evidence that damaged, sore muscles have reduced insulin sensitivity and thus are less able to recover their normal glycogen levels.

Another example of loss of muscle function after strenuous eccentric exercise is greater tremor and impaired performance of fine motor tasks. Ever noticed that you feel a little shaky after a hard workout? The exact reason for this has been difficult to determine but is probably due to some subtle changes in the function of the nervous system "wiring" that connects the brain to the damaged muscles. These changes probably also contribute to the loss of proprioceptive function that is seen in damaged muscles, i.e., a loss of ability to "sense" where our limb is in space. It also appears that after unaccustomed eccentric exercise we are unable to gauge the force output from our own muscles with normal precision. Better make sure if you are going in for delicate surgery that your surgeon is not a CrossFitter who has PR'ed on Linda that morning!

Silver lining: Less damage and pain next time

I know it all seems very negative to this point. But there is a silver lining. It's called the "repeated bout effect." This refers to the fact that another similar bout of exercise will not have the same consequences as before. We all intuitively know this. This is what training is all about: improving our muscular work capacity and recovery capabilities. The exact "black box" adaptations within the muscle that are contributing to the repeated bout effect have not yet been elucidated, but they

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are probably a combination of increased structural strength of muscle fibers, metabolic adaptation and neuromuscular changes. A key point is that if we go back to being a couch potato all that good work and adaptation will disappear within a few weeks.

Pain a la CrossFit: Fast, high-rep, full-range movements are a potentially potent cause of DOMS

You probably don't need me to explain that the major reason why DOMS is a recurring theme in CrossFit is the emphasis on constantly varied movement patterns. A specialized athlete will typically use similar muscle groups day in and day out. Thus, the specific muscles concerned will adapt and become quite resistant to muscle damage and DOMS. The CrossFit athlete is using a far greater diversity of muscle groups with constantly differing movement patterns. The result is that we will regularly be hitting muscles with unaccustomed exercises. *Voila!* DOMS is inevitable in this scenario.

Think about the types of CrossFit workouts that make you sore. What are they? The thing that has surprised me most about CrossFit is the degree and depth of soreness that one gets from the high repetition bodyweight workouts. I remember the first time I did the pull-ups/pushups/squats of Cindy (it wasn't even a full Cindy – only 12 minutes). I thought I was reasonably fit, but that was close to being the most soreness I have ever experienced in my life! I was initially surprised that the heavy strength days (workouts with rep schemes like 1-1-1-1-1-1-1 or 3-3-3-3-3) while tiring, didn't produce the same level of soreness as some of those other bodyweight workouts. So what might be the explanation?

Research has shown that *faster* eccentric contractions tend to cause greater strain and thus greater damage within muscle. This is why many people really notice soreness after workouts that involve explosive and/or jumping type movements. With a high repetition bodyweight workout such as Cindy, I think the degree of soreness can probably be attributed to two things: first, the high number of total repetitions/work done (20 rounds of Cindy equates to 100 pull-ups, 200 push-ups and 300 squats) and, second, the relatively high speed at which these repetitions are performed. Compare these numbers to a heavy back squat day of 3-3-3-3-3. Yes, the tension in the muscle will be higher with the heavier weights but the total repetitions with the heavy weight are only 15 and, critically, those repetitions cannot be performed at the same speed as during an unloaded Cindy, thus resulting in potentially less intramuscular strain and thus damage.

There is also good evidence to suggest that there is a length-dependent component in the development of muscle damage. Muscles that are stressed quickly and eccentrically *while simultaneously being close to their fully stretched position* (think about the quads, adductors and glutes in the full squat position during wall ball for example) are more likely to become damaged than if the eccentric action occurs only during the mid-range of movement or earlier (i.e., if you fail to squat down adequately between reps). Thus CrossFit's emphasis on quality *full range* movements performed at high intensity is a perfect recipe for muscle damage and repair, i.e. adaptation.

Practical recommendations: Go easy on extremely sore muscles, don't expect much from stretching and massage

Let's address some practical issues and some of the SB out there regarding muscle damage and DOMS.

Should you train if your muscles are sore? There are many fitness experts who would tell you a flat "no." Well, the real answer is: *it depends*. You are the owner of your body and you need to make that call for yourself. Mild to moderate DOMS is unlikely to be a problem. However, if you have severe soreness in a particular muscle group I would suggest that you provide that body part with some relative rest. An example: if you have severe soreness in your legs from squatting during Cindy, then you would be prudent to avoid attacking a workout with heavy back squats the next day (a very similar movement pattern). I see less of a problem if you *run* on those sore legs, as the movement is quite different from what caused the damage. Just be aware that your run performance will probably suffer in comparison to running on fresh legs.

Note that chronic muscle soreness that seems to linger for longer than usual may be a sign of over-training, or under-recovery, whichever way you choose to look at it. If you are feeling unusually unenthusiastic about your training, and you are noticing chronic muscle soreness, you would be well advised to listen to your body and take appropriate rest until your body and mind are back in the game.

Remember that muscle damage and soreness are essential and probably unavoidable pre-requisites for optimal muscular adaptation. If you have an aversion to feeling sore, you can either stop doing CrossFit (not an option for most!) or reframe your attitude. How? Try any or all of the following:

1. DOMS can make you feel less guilty about taking rest days.
2. DOMS is a sign that your body is adapting.
3. DOMS gives you valuable delayed feedback about your performance in the exercises concerned.

As an explanation for point 3, let's say you have done a heavy deadlift 3-3-3-3-3 WOD. You can expect that you will feel some soreness/fatigue in the lower back muscles in the days after this workout, as it is primarily a low back exercise. But if you notice excessive soreness in an unusual place this may be a signal that your technique might need some work. If you keep a log or record of your workouts, you should make a note of where you felt sore and use this information to help you tweak your technique the next time.

How about stretching? Can it reduce muscle damage and DOMS? There are some good discussion points here. First, *gentle* stretching of a muscle that is already sore is perfectly acceptable, is not likely to negatively affect muscle recovery, and can be used to minimize the short-term sensation of pain and soreness. But what about post-exercise static stretching? It is often claimed that static stretching after a hard workout can reduce muscle soreness in the coming day(s). Well, now that you understand the initial cause of muscle damage (microtears within the muscle fibers) you should also appreciate that this claim simply does not make sense. Is stretching after a hard workout going to "undo" the damage in some magical way? Clearly not. And scientific studies have also consistently failed to find an effect. Static stretching after a workout when the muscles are warm is an excellent idea and, when done on a regular basis, can significantly improve muscle extensibility. This improved flexibility may assist in improving performance and probably assists in preventing strain type injuries. But let's be careful about claims that we make for post-exercise stretching and short-term DOMS.

How about warming up and stretching *prior* to a workout? Can this influence the DOMS that we may experience? It would seem logical to suggest that warming up might offer some protection against muscle damage by increasing muscle temperature and "loosening" up the muscle(s) concerned. Unfortunately, there is minimal evidence to support this either! Of course, this should not be interpreted as a reason not to warm up – warming up can improve subsequent performance and potentially minimize the chances of muscle strain injury. Just don't expect that you will necessarily be protected from DOMS in the days afterwards. While on this topic, most CrossFitters are well aware that the best form of stretching prior to explosive or powerful exercise is dynamic stretching, i.e., controlled movements that challenge a muscle's range of motion. Prolonged static stretching prior to exercise has consistently been shown to reduce the subsequent explosive ability of the muscle and is best left to the post-exercise period, as I mentioned above. Ballistic stretching (repetitive bouncing near the end range of motion of a muscle) is less effective at improving flexibility than either dynamic or static stretching, may predispose to injury and is not recommended for most athletes.

What about massage after exercise? While it may be very relaxing and assist in general recovery, there is no conclusive evidence that this will reduce the extent of DOMS. Cryotherapy (ice) also appears to have minimal effect. And this brings us to anti-inflammatory medication. Popping an ibuprofen or other non-steroidal anti-inflammatory drug to reduce DOMS might seem like a good idea but is not recommended. It may indeed reduce the amount of discomfort that you feel, but (a) soreness is there for a reason and by artificially reducing it you run the risk of further injury to a muscle, and (b) there is good evidence that anti-inflammatory medication can slow down the adaptive processes in muscle.

Conclusions: Progress sensibly and don't take long layoffs

So the bottom line, as with other things in life, is that there is no easy ticket. Muscle damage and soreness should be accepted as what it is – useful feedback from your body telling you to give the muscle(s) concerned some relative rest. Everybody has a different body and you must learn to listen to yours. As a novice or intermediate CrossFitter your best bet is to progress gradually in your workouts in terms of weight and repetitions used. Reel in that ego: don't ski with the experts on a double black diamond run if you are a green run skier. Also, don't take long layoffs from CrossFit-style training. You are probably better off doing fewer WODs more consistently than overdosing on WODs and taking long breaks in between. One of the beauties of the CrossFit approach is that if you are away from your gym for a significant time it is easy to concoct workouts consisting of air squats, push-ups, pull-ups and sit-ups, etc. If performed at high intensity, these will prevent your muscles from "de-adapting." Oh, and a final word of advice: take at least 10-15 minutes to stretch after your workouts. Though this may not necessarily protect you from DOMS, the increased flexibility will make you feel better and may improve your performance.

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Overhead Is Rising

Misunderstood, often-ignored, and unfairly tarred as unsafe, overhead exercises like presses, jerks, push presses, and push jerks can help a wide range of athletes build wide, powerful, and flexible arms, shoulders, and back. Here's how to do them right.

Bill Starr

Overhead strength provides functional power to athletes in every sport imaginable, yet the lifts used to build this strength have been largely neglected for a long time. In fact, since the bench press replaced the military press as the standard for upper body strength and overall strength in the early 70s, (see sidebar below, "Why the Overhead Died") overhead movements are often banned from strength training programs as being ineffective and unsafe.

If you ask me, that is simply wrong. In my opinion, the overhead press is not only safe when you do it right and safer than a flat bench press, it is capable of being a far superior strength and fitness tool for athletes. There are a host of reasons:

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WHY THE OVERHEAD DIED

Prior to the 1970s, everyone who trained with weights did a great deal of overhead work. In most cases, at least one-third of the routine was dedicated to those exercises. Strength-trained athletes, fitness enthusiasts, bodybuilders, and, of course, Olympic weightlifters always included several types of overhead lifts in their programs.

Yes, even aspiring bodybuilders did them. That's because nearly all the contestants in the top physique shows did presses and jerks, and many also added push presses and push jerks. They also snatched and clean and jerked. Why? So they could compete at Olympic meets and gain those much sought-after athletic points. Those five points often proved to be the difference between winning and floundering way back in the pack.

Then, in the early 1970s, several events occurred in rather quick succession that drastically changed the face of physical culture in this country, and proved to be the death knell for the overhead lifts except for those who participated in the sport of Olympic weightlifting. However, even this group of athletes was affected when the press was eliminated from official competition by the International Olympic Committee in 1972.

This decision ended up having far-reaching implications. The reason the press was dropped was because it was deemed potentially harmful to the lower back. However, those close to the sport knew the real reason the lift was suddenly no longer part of the competition and it had nothing to do with safety. That was no more than a smoke screen. Lifters were not injuring their backs anymore than they injured their shoulders, elbows, or knees. The press was

1. "Convertible" strength

The strength gained from doing presses and other overhead exercises is applicable to more athletic events than any other shoulder girdle movement—especially those sports that require the athletes to extend their arms overhead, including basketball, volleyball, tennis, baseball, lacrosse, swimming, the field events in track (javelin, shot put), and nearly every position in football. Only interior linemen benefit from doing flat benches, whereas the backfield, defensive backs, linebackers, wide receivers, and tight ends use the strength gained from overhead work more so than the flat or even the incline bench. There are others, too, but you get the idea.

Overhead lifts are even more convertible to other lifting exercises. I knew of many Olympic lifters who were pressing 300 or more who could lay down on a bench and use 400 without any prior practice on that exercise. Conversely, I have never seen a 400-pound bencher be able to overhead press 300. Most are barely able to handle in the 225 to 250 range.

2. Proportionate strength

Overhead exercises develop a more proportionate strength in the shoulder girdle than any other upper body movement. Presses, jerks, push presses, and push jerks create wide, powerful arms and shoulders, with less emphasis on the chest muscles, which play a minor role in nearly every sport. Overhead work does hit the high portion of the chest—a good thing since that part of the pecs helps to stabilize the shoulder girdle.

3. More flexibility

Overhead exercises do not hinder shoulder flexibility. Rather, they enhance it—an important point for anyone participating in a sport which requires a high degree of shoulder flexibility, such as gymnastics, the martial arts, and wrestling.

4. Works back, hips, even legs

While most upper body exercises only work the groups that make up the shoulder girdle, overhead movements also strengthen the back, from the traps to the lumbars, and also directly involve the hips, glutes, and legs. Most do not think about how much the back is utilized during overhead lifts. That is, until they go though a strenuous overhead workout. Then it becomes quite clear. When I start an athlete on overhead presses or jerks, the area of his body that gets the most sore is almost always his back.

eliminated because judging the lift had become very erratic and inconsistent. Judging the newer style of overhead press, which was much more explosive than the traditional technique, became more subjective and varied from class to class, depending on who was sitting in the judges' seats. One group might be allowed to knee-kick the bar upward at the start and lay back to ridiculous extremes, while the very next group was required to do the lift in strict form. On the international scene, the press became a political football. A judge from a rival nation would turn down an attempt even when it was done in perfect fashion. When those in power determined they could no longer control the situation, they decided that it would be easer just to eliminate the lift than try to enforce stricter standards from the judges.

The early 70s saw the spread of strength training for athletic teams sweep across the country, especially for football, like wildfire. Even small high schools and Division III colleges had some sort of strength program. Those routines usually had three or four primary exercises for the back, hip and legs, and shoulder girdle. The exercise of choice for the upper body was the flat bench, not the overhead press. The reasoning behind this decision was based on: 1) the notion that the press was a risky lift and 2) it was much easier to teach the flat bench than the overhead lift. But the bigger of the two factors was certainly safety. School administrators and coaches wanted no part of exercise that an international body had determined to be unsafe. They were correct about the overhead press being more difficult to

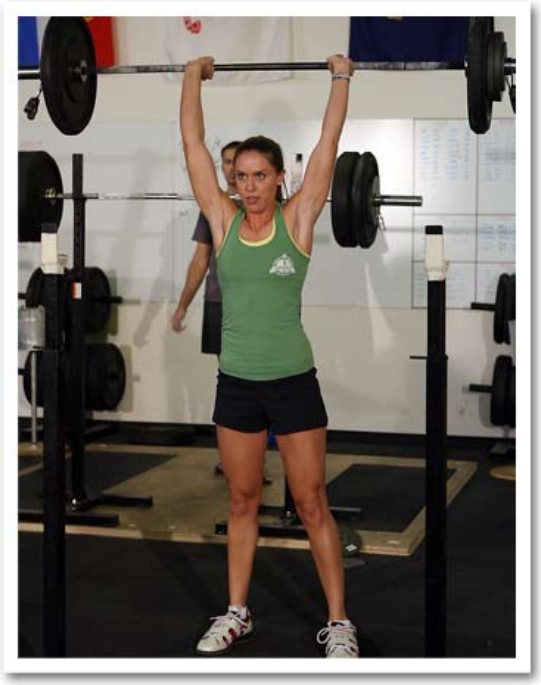
5. Protects rotator cuffs

The area of the back that get the most sore is usually the middle or right over his shoulder blades. Gaining and maintaining strength in this latter area is extremely beneficial since this is where the muscles that constitute the rotator cuffs are located. Back when the overhead press was the primary upper body exercise, rotator cuff injuries were unheard of. We didn't even know there were such muscles. But when the bench press replaced the overhead press and the lifters failed to do specific work on their upper backs and therefore the rotator cuffs, injury rates soared for those small but critical muscles.

In this regard, I should add that the very best way to rebuild a slightly damaged rotator cuff is by doing overhead presses. Start with dumbells, gradually work up to the barbell and proceed from there. It takes a bit of time, but eventually you will be able to strengthen those small muscles. It sure beats the alternative of surgery.

6. Balance and good looks

The overhead lifts belong in the routine of every strength athlete—including bodybuilder. Presses, jerks, push presses, and push jerks build a more balanced and pleasing physique than other upper body exercises.



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teach than the flat bench because it is. And since the majority of the strength coaches in that time frame were really football coaches, they did not have the expertise to teach their players how to press the bar overhead correctly.

While this was happening, Joe and Ben Weider took control of physique competition with the lure of sizeable monetary rewards that were not offered by the A.A.U. or Bob Hoffman. One of the first moves the Weiders made was to drop the athletic points. That meant the bodybuilders no longer had any motivation to lift in Olympic meets, so they stopped pressing, snatching, cleaning, and jerking. This drastic change in training procedure had a filter-down effect on younger bodybuilders. If the top guys didn't do any overhead lifts, then they wouldn't either.

The early 70s also saw the emergence of the new strength sport of powerlifting, mostly because the bench press, squat, and deadlift were much easier to learn than the high-skill snatch and clean and jerk. Rarely did a powerlifter include any overhead lifting in his routine.

The final straw in the demise of the overhead lifts came with the introduction of many well-designed machines such as the Nautilus. Now a person could gain size, strength, and a higher level of fitness without having to deal with barbells or dumbells. At least, that's what the manufacturers and proponents of the equipment proclaimed, and a great many people bought the concept. Machine training was easier than working with free weights, and it seems the majority of the population is always eager to take the easy over hard.

OVERHEAD EXERCISE TUTORIALS

Correct form is absolutely key for all overhead exercises, whose balance component requires a much higher skill level and more practice than exercise performed closer to the core of the body. For the record, the overhead press is a safe exercise when done right. Those very few who did sustain some type of lower back injury while performing a heavy press did so because of leaning back excessively. Some were able to lean so far backward that the lift resembled a standing bench press. It goes without saying that this outlandish maneuver should be avoided, but the truth of the matter is, this move is almost impossible to achieve unless it's practiced for a number of years.

A slight backward lean is acceptable, even beneficial in helping to keep the bar over the base of power, yet in most cases, the athlete has trouble bowing his back at all. It's not a natural move. I've never had any athlete hurt his back doing an overhead press because of leaning too far backward. The problem is getting them to bow their backs in perfect timing and coordination with the drive and rapid follow through.

In regards to injuries, the bench press ranks the highest of all exercises in strength training, but no one has ever suggested that this popular lift be removed from any program. Ugly form is tolerated, even encouraged by strength and sports coaches so that they can boast of x-number of 300-pound benchers. Quite often, bad technique is coupled with gross overtraining on the bench and as a result, elbows, wrists, and shoulders pay the price.

Here's how to perform the various overhead exercises safely and effectively.

Military or Overhead press

This is an exercise that's easy to learn but difficult to master. In my 15 years of coaching at three universities, only two athletes were able to do a 250-pound military press, while I had several dozen who benched over 400—proof that pressing heavy weights overhead is really a high-skill exercise and takes a lot of training to achieve.

Feet first

Stand at shoulder width, with toes straight ahead and on a line. One of the most common mistakes beginners make is to place one foot out in front of the other. This

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So after only a few years, the only group of strength athletes who continued to do any type of overhead lifting were Olympic weightlifters. And they, for the most part, just did jerks. Very few did any overhead pressing, which many strength coaches, myself included, believed to be a huge mistake. Those muscles and attachments used to press heavy poundages are the same needed to control and fix a heavy jerk overhead.

Editor's Note: Obviously, the full spectrum of overhead lifts are central to CrossFit's programming. In addition to the press, push press, push jerk, and split jerk, we incorporate thrusters, swings, overhead squats, and snatches. Coach Starr is referring to the predominant tendencies in Globo-gyms, bodybuilding, and the presently established strength and conditioning protocols for universities and professional sports teams.

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is incorrect, because it creates a weaker base and it also places an unequal stress on the lower back.

Hand and elbow position

For most, grabbing the bar with a shoulder-width grip works. Extend your thumbs so that they barely touch the smooth center of an Olympic bar. Naturally, those with narrow or very wide shoulders will have to alter their grips slightly, but a bit of trial and error will take care of that. Just remember, when doing any type of pressing movement, your elbows should always stay directly under your wrists. That means your forearms will be in a vertical position throughout the lift.

While learning this exercise, you can either clean the bar or take it off the rack. Either way is effective. Once you learn the proper form you might want to start cleaning the weights because it's actually easier to press a weight after it has been cleaned than it is pressing it after taking it off a rack.

Starting position

Fix the weight across your frontal deltoids, not on your collarbones. To do this, elevate your shoulder girdle to create a muscular ledge. Your elbows should not be high, as in parallel to the floor, or pointed downward, but set somewhere in between those two extremes. Your wrists must be straight and they have to stay locked throughout the lift. If this poses a problem, wrap or tape them. If the wrists are allowed to twist or flex even slightly, the power generated by the back, shoulders, and arms cannot be transferred into the bar efficiently.

Once the bar is set properly on your frontal deltoids, take just a moment to tighten all the muscles of your body. Begin with your feet. Don't just stand on the floor, but drive your feet down into it and think about gripping it with your toes. We liked to use the image of a bird sitting on a tree limb and gripping the limb as tightly as he could. Then move on up your body, contracting your thighs, glutes, back, and shoulders, and arms. Now ease your midsection a bit forward so that you're coiled like a spring. Your knees should be locked and stay that way during the press.

Maintain body position through the press

Look straight ahead from start to finish. Don't follow the bar's upward movement with your eyes, as many do; this will cause you to lean back and take you out of a strong pressing position. Until you learn the form in the

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press, drive the bar off your shoulders deliberately. This will enable you to use the correct line on every rep. But after you feel confident with the lift, begin driving the bar upward in an explosive manner. Think in terms of a boxing punch: quick and powerful.

The start needs to be close to your face with the bar almost touching your nose. The initial drive will carry the bar to the top of your head. Follow through immediately. Any hesitation will cause the bar to stall. As it passes the top of your head, don't lean away from the bar, but extend your head through the gap you've created and bow your pelvis forward while keeping your knees locked. These moves will keep your power base under the bar and allow you to use your levers more effectively.

Be aware that the bar will always try to run forward, especially when the weights get heavy. After all, the bar doesn't have a brain—it goes where you guide it. So drill on the movement until it climbs upward in the same line every time. As soon as you lock out the bar, bring your torso erect and push up into the bar and hold it for 5-6 seconds. This simple act activates all of those groups which are responsible for supporting weights overhead, including all of the back, hips, and legs muscles.

When the bar is locked out, visualize a line running directly upward from the back of your head. That's where you want the bar to be because that places it right over your spine and is the strongest supporting position there is.

The press, like any other exercise consists of a start, middle, and finish. These three segments must blend together into a continuous, fluid movement. After you drive the bar off your shoulders, follow through by applying more pressure into the bar and it will shoot through the middle range. When you do that, you'll find that the finish is much easier.

With emphasis on good form , you will quickly begin to feel the rhythm of pressing a weight overhead. A well-executed press will glide upward as if an unseen hand is lending assistance.

Coming down

Lower the bar back to your shoulders in a controlled manner. Never allow it to crash down, because that will not only bang up your shoulders and collarbones, it will also move the bar out of the ideal starting position and therefore adversely affect your next rep. When the weights get heavy, bend your knees a bit to cushion the descending bar. Then, relock them, tighten all your muscles again, get set, and do the next rep.

Breath control

In the beginning, while using light weights, how you breathe during the press doesn't matter much. However, as the poundages get demanding, breathing is critical. Just before you drive the bar upward, off your shoulders, take a deep breath and hold it until you have locked out the bar or at least driven it through the sticking point. Breathing while the bar is in motion diminishes your ability to apply force to it. This is because inhaling or exhaling causes your diaphragm to relax and this, in turn, creates a negative intrathoracic pressure. In other words, you no longer have a solid base when you breathe. Once you have the bar locked out, take as many deep breaths as you need, lower the bar back to the starting position, reset, and take another deep breath before your next rep.

Reps and Sets

During the learning stage, stay with five sets of five, starting with light weights and working up to as much as you can handle while using good form. Then after six

to eight weeks of practicing the technique and building a firm foundation, switch over to this set and rep formula: two sets of five as warm-ups, followed by three to five sets of triples. Use the same weight on the threes and if you're able to make every rep, increase the top-end weight the next time you press.

Jerks

Jerks are currently done more frequently than overhead presses, because many high school, collegiate, and sports coaches have learned that his dynamic, high-skill exercise increases foot speed and coordination as well as strength. And, like the press, it is very convertible in terms of being able to utilize these athletic attributes in a wide range of sports.

While jerks can be taught when someone is just starting to train with weights, I have found that they do better if they wait until they have built strength first through overhead presses. After a couple of months doing those, an athlete is better able to perform jerks correctly.

Knee kick and fast feet

The fundamentals for the jerk are the same as for overhead presses—grip, foot, stance, and racking the bar on the frontal deltoids. The difference is that you'll use a knee kick to drive the bar upward and you'll be moving your feet.

Once you have your feet on a line and the bar racked solidly on your shoulders, take a short dip and drive the bar upward. As in the press, it should move close to your face.

Now comes the hard part. As the bar climbs upward, one foot moves forward and the other backward. They must move extremely fast and hit the platform at the same time. Bang them into the floor. Ideally, you will also be locking out the bar when your feet slam into the floor or platform. Your torso must stay erect. Any forward leaning will cause the bar to run out front and if it's allowed to travel too far, you will not be able to fix it overhead.

Which foot you move forward is purely an individual matter. It's like being left- or right-handed. Your lead foot will only travel a short distance, no more than the length of your foot. In contrast, your rear foot will move much further since it's your lever leg. Your front foot will move straight forward and your back foot must also move straight backward. A common mistake most beginners make is they swing the rear leg around slightly, so when

LIFTING BELTS

The question invariably comes up as to whether athletes should wear lifting belts when doing overhead lifts. I recommend that they do wear a belt, but not for the reason most have in mind. A belt, no matter how wide or thick it may be will not prevent an injury if sloppy technique is utilized. However, a belt is beneficial in that it helps keep the lower back warm during a workout and this does reduce the risk to the lumbars. A belt also provides valuable feedback to signal that you're leaning too far backward or forward. And a snug belt helps keep your midsection tight and this is most reassuring when handling heavy weights.

they plant their foot, it's in the middle of their body. This severely affects balance. Also, the rear foot must land on the toes. It can't be turned so the heel or side of the foot is making contact with the floor.

This is a high-skill move and can only be mastered with lots of practice. Stay with light poundages until you get the feel and rhythm of the split. I often have lifters draw lines with chalk to mark exactly where they want their feet to hit. Even drilling with a broomstick helps.

Lock out the weight and recover

Once you're in a split and have the bar locked out, continue to exert pressure on it. If the weight is light, merely stand up. However, when the weight gets taxing, follow this procedure: Slide your rear foot forward a bit, then your front foot, rear foot, front foot, until you're stable enough to stand erect. Do not move the front foot first. If you do, the bar will suddenly be suspended over air with nothing to support it. At the bottom of the split, your knee should extend out in front of your lead foot and your rear leg should be straight and locked.

As soon as you have the weight locked out and under control, recover. Don't linger in that split position. Stand up and keep pushing up into the bar. It should be fixed overhead in the same position as an overhead press, on a line extending up from the back of your head, On your final rep of a set, hold the bar overhead for a 5-6 second count. Lower the bar in a controlled fashion, make sure your feet are pointed straight ahead and on a line and your rack is right, take a breath and do the next rep.

Reps and Sets

When learning the exercise with light weights, I have athletes do five reps, but as soon as the poundages get demanding, I recommend threes. The reason: every time the bar is reset after a rep, it moves a bit out of the ideal starting position. Plus, more weight can be handled with triples than with fives and this builds greater overhead strength. If the bar slips off the shoulders too much, stop. Place the bar on the rack and reset it on your shoulders. In some cases, I have the athlete use two reps rather than three if the slippage is severe. Six to eight sets is a good workout.

Push Presses and Push Jerks

After you learn how to overhead press and jerk, push presses and push jerks are a snap. On both exercises, you bend your knees to help you drive the bar upward, but on the push press, once you lock your knees, they need to remain locked. On the push jerk, you can rebend them and the bar will move from your shoulders to lockout in one fast movement. The push press is different in this regard. You want to have to press out the weight for the final 2-4 inches. Again, use three reps when the numbers get higher and hold the final rep overhead for 5-6 seconds.

There is a tendency for beginners to dip too low when push pressing or push jerking. But, when someone dips too low, he has difficulty putting a pop into the bar. The dip is a short, powerful stroke. Your entire body must be rigidly tight and perfectly upright. Both exercises are really drills to help you learn how to drive a heavy weight upward, in the correct line, and to follow through instantly. And since a lot more weight can be used on the push press than with a military press, it overloads those muscles to a greater extent.

If you're not currently doing any overhead exercises, give one or all of these a try. Many find that they have a natural aptitude for the exercises. They will not only improve your physique and strength, they will enhance those attributes that help you excel in your sport.

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Bill Starr is the author of the books ***The Strongest Shall Survive: Strength Training for Football***, ***Defying Gravity***, and thousands of magazine articles. He was the editor of Bob Hoffman's ***Strength and Health***, Joe Weider's ***Muscle Builder***, and a nationally-ranked Olympic weightlifter and powerlifter *back in the day*. Bill was one of the first professional strength coaches in the country, has forgotten more about training than most coaches will ever have the opportunity to learn, and makes a very convincing crab cake if you can talk him into it.

—Mark Rippetoe

the CrossFit JOURNAL ARTICLES

CrossFit in Yosemite: No Walk in the Park

Carrying injured hikers down steep trails. Wrestling drunks. Raiding pot farms. Fighting forest fires. Counseling suicidal teens out of deadly whitewater. Heli-rappelling down the sheer face of El Capitan. It's all in a day's work for a super-fit national park ranger.

Steve Yu

Photo by Dave Pope

It's seven in the morning, the sun isn't up yet, and I open up the garage to get started on my WOD, which for today is 3-3-3-1-1-1 of power clean. I start with the CrossFit warm-up, do a round of the Burgener warm-up, a couple of warm-up sets and then my work sets, which I video and review. I'm pleased to find out I'm getting full hip extension at the top of the second lift, but note that I need to work on not pulling early with the arms when the load gets heavy.

The sun still hasn't broken the Valley rim, and it is quiet other than the sound of the Steller's Jays songbirds calling to one another, a combination of a rapid "shek-shek-shek-shek" rattle and a harsh metal-on-metal ring. The air is cool and moist and permeated with the scent of incense cedar, pine, and granitic soil. These are the quintessential sensations of our home: Yosemite Valley in Yosemite National Park.

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The park itself, larger than the state of Rhode Island, ranges in elevation from 1,700' in the El Portal area to the 13,114' summit of Mount Lyell. Companion to this range in elevations is a huge variety of biotic communities and landscapes. These communities include foothills chaparral dominated by live oak, mixed oak-conifer forests of the valleys, conifer forests dominated by red and white fir, monotypic stands of lodge-pole pine, and montane tundra. The terrain itself has idyllic montane valleys and meadows, rolling hills, steep slopes, horrendous gullies filled with crumbly rock, and sheer cliffs like the ubiquitous Half-Dome and El Capitan.

Add two parts rugged terrain, 3.2 million visitors, one part inexperience, one part bad judgment, and you have a recipe for job security

As rangers and special agents for the National Park Service, we protect those who visit the park from themselves, others, and the park itself. Of course, we also protect the park from those who visit. Most are just ignorant visitors in need of education, but a few would wantonly despoil our shared national heritage.

On any given day, we can be carrying an injured hiker out from the Vernal Falls trail corridor, wrestling a drunk on the Curry Village pizza deck, raiding a marijuana cultivation site on the steep, brush-choked canyon walls of the Merced river, retrieving a body from the maelstrom at the base of Nevada Falls, heli-rappelling onto the sheer face of El Capitan, fighting a forest fire in 100-degree weather, hunting poachers on our boundary, extricating victims from the wreckage of a motor-vehicle accident, or searching for a lost hiker in a winter storm.

Often these incidents will take place contemporaneously, or they can be bizarre combinations that you wouldn't imagine possible: forest fires started by suicidal murderers; a report of "shots fired" that turns into a heli-rappel rescue; three simultaneous El Capitan rescues during a body recovery; a search for a depressed person who, when found, doesn't really want to be found or helped; a 12-year-old girl who slips into the Merced River at full melt-off – a roaring cauldron of white frothy death – and miraculously flushes out unharmed 20 yards downstream; the Half-Dome hiker saved from a sure to be fatal fall by a sweat-pants wedgie. You can't make this stuff up.

To this day I am amazed by the trouble people can get themselves into when taken out of their element. Even

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more amazing is how many visitors make a bad decision, have bad luck, or just plain blow it and still make it out alive if not unscathed.

In the Yosemite Valley, the raven and the coyote are two of the most commonly seen wildlife species. Globally, the ascent of man has caused most other species to decline in range and numbers, but not these two. They have succeeded where others have declined, been extirpated, or gone extinct for one reason: because they are generalists. Specialists require a specific niche, but the raven and coyote can fill many niches. They are intelligent, adaptable, and do many things very well. They do nothing superlatively, except survive.

Like the raven and coyote, rangers are also generalists. Our jobs are all-risk; we are cops, EMT's, firefighters, resource protectors, social workers, and camp counselors all rolled into one package. Specialization is discouraged. We are the jackknives of the service. And CrossFit is practically designed for the demands of our work.

From body-building to rock climbing to CrossFit

I first came to Yosemite in 1989 as a climber. Although no great shakes as a climber (I have a couple of El Capitan routes on my resume and a couple of other routes that I'm kind of proud of), I quickly fell in love with the place in a way that transcended my climber's love of the Valley's cliffs and walls. Splitting my time as a carpenter, wildlife researcher and climbing bum, I migrated back and forth between my home in Wisconsin and the west for the next several years.

In 1995 I worked on the Yosemite Valley Search and Rescue Site. The Rescue Site, or SAR Site, is a patch of dirt in the back of Camp 4, the home for emergency hire climbers. The climbers get to stay on Site for the summer, and in return they carry pagers and respond to search and rescue and other missions for the National Park Service.

While on the Site, I realized that being a ranger was pretty darn cool and went to the seasonal ranger academy in Petaluma, California. I then worked as a seasonal ranger for a few years in several parks (Yosemite, Yellowstone, Grand Canyon, Denali, Joshua Tree) until coming to Yosemite's Valley District full-time in January of 2000. CrossFit came five years later.

I had always been into fitness, or what I thought was fitness. When I was a teen-ager in the 80s, Arnold Schwarzenegger, the king of the box office, had an inordinate influence on my hormone-addled adolescent brain. Arnold-wanna-be-ism (patently ridiculous given my slight frame) led me to the "Muscle and Fitness" globo-gym and 20 years of futility using the body-builder paradigm: isolation movements, split routines, overuse injuries, and very few tangible results.

Going to the University of Wisconsin-Madison opened many doors for me, including the door to rock-climbing. As an undergrad I spent every climbable weekend at the local crag, Devil's Lake, a quartzite remnant of the old Baraboo range, the oldest exposed rock in North America. Devil's Lake's purple quartzite played to my strengths as a climber, with its short, powerful face

Photo by Steve Yu

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Photos by Steve Yu

routes requiring athleticism, finger-strength, and a high strength to weight ratio.

I climbed, virtually to the exclusion of any other physical activity, until the mid-90s, when the demands of being a rookie park ranger and a savage case of medial epicondylitis limited my climbing time. From the mid-90s until 2004, my fitness regime consisted of martial arts, climbing, weight-training and a little running.

When I returned to Yosemite in June of 2005 from the Federal Law Enforcement Training Center, the thought of going to the weight room for 3 sets of 10 and a split routine simply depressed me. I had felt for years that something was missing from my training regimen, but couldn't quite put my finger on it. I felt continually frustrated by what I was doing fitness-wise, never seeming to make long-term gains, always battling one injury or another, and having trouble staying on a consistent program.

Our friend Chris Robinson, who had been suggesting CrossFit to my wife Laurie for months, finally convinced me to try it. After CrossFitting out of our garage gym for a few months, Laurie (a strong climber in her own right and a better CrossFitter than me) and I went bouldering at Camp 4. We proceeded to fire off problem after problem without having climbed for almost a year (I had torn my labrum in 2003 which required surgery in 2004). This display of CrossFit's conditioning effect sold us on the efficacy of the methodology and the soundness of its theories.

Since then, time and again, the functional strength and fitness we have developed from CrossFitting have had real and tangible benefits to our work, our play, and our day-to-day lives. Whether creeping into a marijuana garden, jumping over giant logs, breaking up concrete, picking up a full cooler of food, or cleaning a filing cabinet to my chest and pressing it into a dumpster, I am more prepared than ever to face the challenges of the day, mentally as well as physically.

After becoming believers, like many CrossFitters, we became zealots, preaching the gospel of CrossFit to whatever poor soul crossed our path. Woe upon any who wouldn't listen, for they would suffer the eternal hell-fire of over-use injuries, peaked biceps, and general lame-itude.

Once we got the zealotry out of our system (I was the greater offender), people would start to come over to work out, sometimes as many as four or five in addition to Laurie or me. People would look to me for advice and pointers, but I always felt somewhat inadequate providing the answers. Attendance ebbed and flowed, and I finally attended a Level I cert in San Diego in early May of this year. (Note: A Level I cert does not a trainer make; I have a LONG way to go as a trainer.)

The day after we got home from the cert I gave my first class with three attendees. Since then, word has spread; I still have my three original trainees and now have 15 regulars, not counting Laurie and myself.

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In many ways, the system is tailor-made for National Park Service rangers. The diversity of challenges we face in our environment, the number of hats we wear, and the unpredictability of the call-load all favor the prepared. CrossFit prepares us for these challenges like no other system that I know of. This statement is validated time and again in real-life-out-of-the-gym tests.

- A couple of weeks ago, one of my trainees climbed the northwest face of Half-Dome in a day, part of the Yosemite Hard-Man circuit. Although he had done this previously, he felt stronger than before on the approach, the route, and the descent because of CrossFit. This trainee believes that the high volume of squats were especially instrumental in keeping him strong throughout the day.
- Another trainee, a 55-year-old ranger, told me that although he hasn't been climbing much, when he does climb, it feels like he HAS been climbing a lot. He believes this is a function of a stronger core, developed by CrossFitting, which is critical during climbing movements.
- Another trainee unloaded three pallets of rock before training with us. The DOMS she suffered as a result of this job crippled her for days afterward. After working out with us, she performed the same task with no accompanying soreness. She attributes this partly to better conditioning, and partly to a greater awareness of her hips and the proper lifting technique developed in our CrossFit workouts.
- Another trainee couldn't do a push-up when she first came to me. During a goal-challenge a month ago, four months after starting CrossFit, she busted out 42 push-ups in a minute.

Photo by Dan Horner

Photo by Dave Pope

Photo by Dave Pope

Stronger is Better

As outdoors people and park rangers, much of our training time has been spent hiking, running, biking, climbing, kayaking, and the like. Much of it is skills-based training, which is critical for accomplishing our mission; if a trainee opts for a skills day over a CrossFit day, I support that decision. The drawback to training these skills and techniques is that for the most part it is time spent in the oxidative pathway, with only some time spent in the glycolytic pathway.

Is this a problem? Maybe, maybe not. I have been at many multi-agency incidents where the disparity between NPS ranger fitness and the fitness of other

agencies' personnel is striking; rangers can just plain hike or run other agencies into the ground. On the flip side, put everyone into the gym under iron and the rangers will get crushed. People aren't dying because rangers as a whole aren't that strong; the job still gets done, regardless of what a ranger's bench press is. Yet I can't shake the feeling that we will be better off as an Agency if we as a group get stronger. My conviction is strengthened when virtually all of my ranger trainees want to "get stronger."

In the end, form follows function: we rangers are a lean, wiry bunch because of what we face in the mountains. Those with excessive bulk get punished, badly. For good or ill, the ranger with a 300-pound back-squat is the exception, not the rule. My primary objective for most of my trainees is to make them stronger without sacrificing mountain functionality and endurance. From my own experience, getting stronger, lifting heavy (relatively), and Olympic lifting all have broadened me and made me better in the hills, jumping logs, crossing streams, and hiking up talus fields.

As a trainer, I have a long way to go. People keep coming back, no one's left the gym once they started in earnest, no one has been hurt, and more and more people are coming to me for training. It's a good start. But like CrossFitting itself, for a trainer there is always room for improvement and there is always more to learn.

The day I did the 3-3-3-1-1-1 power-clean workout I hiked to a suspected poacher's hide site. The access to this site included climbing 800' up a hill in less than half a mile, an average 38% grade. I had to do this twice in less than 24 hours, once for size-up, once for the operation itself at 0300 hours. I felt strong both times; it just kind of felt easy and I don't remember that stuff being "easy" before. Perhaps the most germane moment came after I popped over a fallen 3.5-foot diameter tree: behind me I heard my partner mutter, "Damn CrossFit" as he struggled to find a way around the log.

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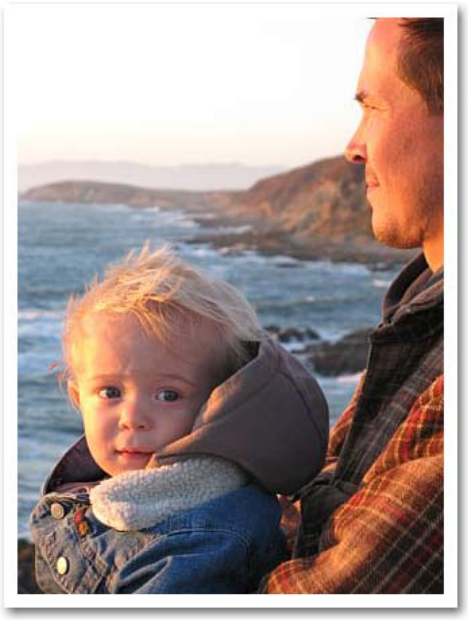

Photo of the author by Laurie Yu

Steve Yu lives in Yosemite National Park with his wife, Laurie and two-year old son, Atticus. An alum of the University of Wisconsin-Madison, Steve has worked for the National Park Service since 1992 as a biological science technician, fee collector, Search-and-Rescue technician, park ranger and special agent. Steve is a former rock-jock whose who has been CrossFitting since 2005, been a CrossFit instructor since May of 2008, and trains people out of his garage gym five to six days a week.

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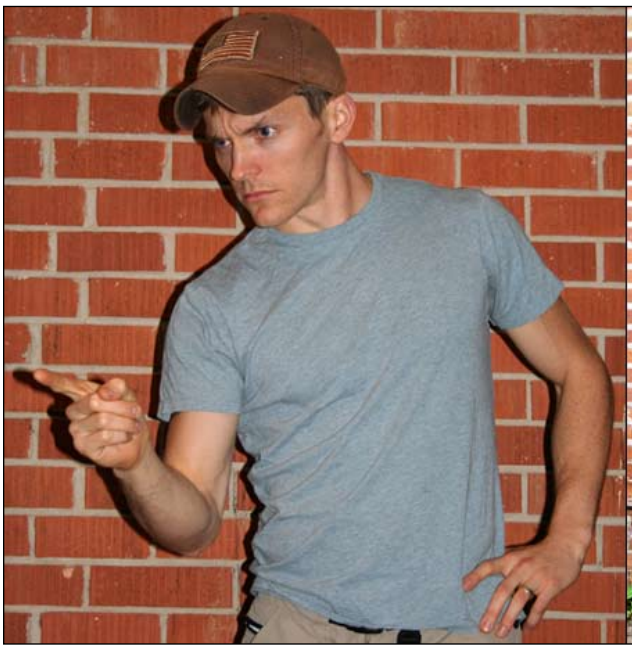
The Politics of CrossFit

Does CrossFit's unique workout philosophy change minds as well as bodies? Russell Berger says yes. Dan Freedman isn't sure.



Russell Berger makes his Point

Dan Freedman's Counterpoint begins on Page 2

It Makes You Libertarian

by Russell Berger

I started paying attention to the CrossFit website four years ago. From the very beginning, CrossFit was built on mold-breaking, counter-culture methodology. One of the cornerstones of CrossFit was its analytical and objective approach to fitness. Establishment, theory, and speculation were cast aside and replaced with workouts that produced results. Recently, I've noticed more and more complaints about the less-noticeable information posted alongside the Workout of the Day. Right-leaning political commentary, articles, and studies are occasionally popping up on rest-day postings. To some this is a perverse and offensive combination. How could partisan journalism be anything but awkward when used as a garnish on a fitness website? If it was anything but CrossFit.com it wouldn't be, but strong conviction to the tenets of individualism and responsibility make CrossFit look less like a fitness program and more like a course in Libertarianism. Not only do these articles "fit the mold" of CrossFit thinking, they embody it.

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Counterpoint: Conformity is whack
by Daniel Freedman

Contrarian provocateurs are my kind of people. They make you think. Even their excesses can build character. (The same could be said of burpees.)

My beef? Some CrossFitters have a reflexive prejudice. They are in love with simple-minded perversity. They seem to think that if most people favor something, it must be wrong. But it ain't necessarily so. Here's the ultimate bit of contrarianism: sometimes the conventional wisdom is right. Sometimes expert opinion is well founded. And maybe CrossFit isn't always and everywhere the right program for all people in all circumstances.

In the fitness realm, who could argue against hard work or individual responsibility? But does it really follow that lax regulation of financial markets is a good idea? Could isolation exercises have a place in rehab programs? Might it be okay to eat bananas after all? Could raising taxes on the top 1% be sound economic policy?

The POSE running technique and privatizing social security are both unpopular. Both may be good ideas. Or not. Or maybe one is a good idea and the other isn't. The connection between a fitness methodology and a political philosophy remains unclear to me. How can CrossFit be said to be "Libertarian?" There are plenty of left-leaning CrossFitters who work hard, accept individual responsibility and voted for Obama. Are they somehow less pure? Or are they okay as long as they have tattoos, swear, and do their workouts without shirts? Just asking!

I do like the CrossFit community. The quality of debate on the rest day articles exceeds what's generally found elsewhere online. (Admittedly, that's not a high bar.) The easily offended should just move along. Or they can approach it as I do Fox News: skipping O'Reilly, but tuning in on Sunday morning for Chris Wallace. In other words, pick and choose when to engage with the rest day articles. If at all.

When you walk into your local CrossFit affiliate for the first time, you have your entire perspective of work, diet, health, and fitness turned upside down within half an hour. First, your are told by some 25 year-old CrossFit trainer that the National Academy of Sports Medicine, Food and Drug Administration, American Heart association, and the American Medical Association, are all wrong. On top of this, he tells you that your vegan sister-in-law, your stack of low-fat diet books, Cheerios commercials, *Runner's World* magazine, and even your own doctor are selling you short on facts.

The importance of this is more than just the physical benefits to you as an athlete; it's the experience itself. Being told that accepted standards are wrong, collapsing your faith in experts and establishment, and asking you to make drastic changes to your lifestyle while the majority continues down the "safe path" can be life-changing. To quote the movie, "Fight Club:"

"It's only after we've lost everything
that we're free to do anything."

The intellectual impact of this experience to the CF newcomer is huge. The idea that professionals and academics can be outpaced by a group of fitness nuts in their garage is empowering to say the least. In short, CrossFit shapes minds, and forces its followers to question *all* established opinions and standards. This healthy skepticism is paired with an understanding that there are often empirically right and wrong answers, waiting to be determined through sound reasoning.

CrossFit works because it has always been an open-source program. Debate and discussion have a vital role in determining its course. In a conversation about the benefits of a high-fat low-carb diet, the subject of coronary heart disease, cancer, and stroke will inevitably arise. Why is it that CrossFitters can so easily make controversial judgments on the prevention of deadly disease, tactical shooting, and techniques used in street fights, but issues of economic and social policy-making are taboo?

What political direction CrossFit.com chooses to take isn't of much consequence. CrossFit is not a public facility. It is not a democracy. It isn't a club, and there are no share-holder rights. It's a concept based on using *what works best* for the desired adaptation. It is the creation of an individual and has been adopted by the masses as a privilege, not a right (much like voting in federal

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I've sometimes been able to score a few points in rest day debates. It's even possible I've helped a few people see old issues in new ways. In the process, I've taken a few punches. That's fine. No one forced me into the ring. And no one is forced to read the wacky right-wing rest day articles. CrossFit should keep posting them. They keep things lively.

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About the Author

Daniel Freedman is a reformed marathon runner, recovering TV News Director and former PBS new media dude. He now consults to non-profits on social networking. He has been CrossFitting in Toronto for 18 months.

elections). The most defining characteristic of CrossFit's existence is the individual responsibility required of its followers. To even begin CrossFit, you must choose to take a different path than the majority of your peers. You must choose to change your perspective on fitness, diet, and work. You must put in the effort as an individual to improve your ability. You must acknowledge your own responsibility to do the exercises correctly and safely. When you fail, it is no one's fault but your own. When your diet starts to slip, it is no one's fault but your own. You rely on yourself for your effort, your results, and your initiative.

If an ideological affiliation had to be applied to CrossFit, it would almost certainly be the "Libertarian method" of fitness. Individual responsibility reigns, and everyone is held to the same standards of performance.

Can you blame Coach Glassman for extending ideas that work so effectively in the fitness world to a larger model? Is it CrossFit's fault for seeing the parallels between a grass-roots fitness methodology and a free and effective society? The concepts that we discuss here are exactly that: concepts, and just as CrossFit makes no attempt to shove its principles down the throats of others, the political articles posted on its site are optional reading material. I have heard three different types of complaints on this subject more than any other, and I will address them separately:

1. You read an article and completely disagree with its content and viewpoint.

Please notice the text below the link to the article: "Post thoughts to comments". This is written under every article for a reason. CrossFit isn't trying to run off those with differing political viewpoints. It is encouraging the same analytical and effective debate you don't see in the mainstream media about fitness *or* politics.

2. You read an article and are offended by it.

Get your panties out of a bunch and go take a Pilates class. By its very nature, CrossFit is not politically correct. We are extremely competitive, we swear, we take off our shirts in public places, tear up our hands, and make fun of people when our girls can deadlift more than they can. What else do CrossFitters do? We offend people. We have opinions that we have forged through experience and hard work and we are not afraid to share them with others. Get used to it.

3. Regardless of your opinions, you would like CrossFit to focus on fitness and leave out divisive issues.

This is completely possible... *for you*. You can do the W.O.D., never even click the link to the article, and no one will ever bother you about it. That's why the site is set up the way it is. If this isn't good enough for you, keep reading:

The most important part of this is that the site belongs to an individual and is provided to you only because that person chooses to do so. You have the choice to do whatever you want, react however you want, and say whatever you want. In a way it's the model of a perfectly free society. This is the Libertarian answer, the CrossFit answer, and the link between politics and fitness. Take it as you will.

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About the Author

Raised in Atlanta, Russell Berger spent four years in 1st Ranger Battalion and saw numerous combat deployments. After starting Crossfit in 2004, he left the military, moved to Alabama and opened CrossFit Huntsville. Currently he splits his time among work, school, arguing politics, and practicing poses just like the one in the attached picture.

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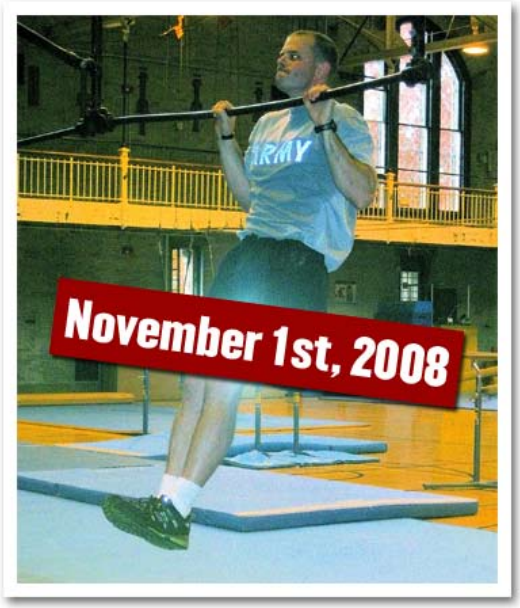
Winning the Battle of the Bulge

How CrossFit helped a hefty West Point officer shape up—and get new leadership skills, too.

Major James Maxwell



"Are you kidding me?" I couldn't believe it. I weighed over 200 pounds again. How is this possible? I had been in the army for over 16 years, doing daily PT, lifting weights... and was over 200 pounds. Diets, starving, taking caffeine pills...over 200 pounds. Thirty-five years old and five-foot ten inches tall... over 200 pounds. Nearly two decades of daily exercise—cross-country and swimming at West Point Prep School, endless activity as a cadet, and starting every day with physical training as a soldier. Still over 200 pounds. Airborne school, Air Assault school, tank company commander in Baghdad. Still over 200 pounds!

"*How is this possible?*" I wondered. Why is every weigh-in before the semi-annual PT test like a weigh-in for a wrestler?

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In December 2007, while assigned to the Department of Military Instruction (DMI) at West Point, I struggled to stay in shape as usual. It had been this way for me since my junior year as a cadet over 12 years ago. I had gone at it hard, swimming at lunch, running, lifting, following a fad diet, but once again injuries started to impact my ability to sustain my program. The pounds came right back on, as usual. I was in a cycle where I would weigh 188 pounds on the day of the PT test, but 195 two weeks later, and back to 200 two weeks after that. Again.

I was at the point where I nearly felt like giving up. No matter what I tried, I could never get and stay where I felt I needed to be to lead soldiers effectively. I started to doubt my ability to stay in the army as a combat leader. It was heartbreaking.

"No way can I do this! What the hell is a 'Muscle Up'? Thirty of them? I can barely do a pull-up!"

About this time I heard about a group of infantrymen and an artilleryman assigned to the department who were doing this thing called CrossFit. It was introduced to them by Lieutenant Colonel Bill Butler, the Chief of Military Training in the Department of Military Instruction. All of them had Ranger tabs. I thought to myself, *"No way could I ever do that. No way. I'm a fat tanker, and fat tankers don't do PT that is THAT hard."*

But, being over 200 pounds again, it was time to do something. So I typed in a web address with no idea that it would change my life: **www.crossfit.com**.

"No way can I do this! What the hell is a 'Muscle Up'? Thirty of them? I can barely do a pull-up!" Doubt filled my head. I almost clicked that "X" in the upper-right-hand corner and closed my browser. *"No, I need to do this," I decided.*

I secured a notebook for my logbook and started. I weighed and taped myself. I started doing CrossFit on January 3rd, 2008, weighing 201 pounds with 31% body-fat. I wrote in the front of my logbook, *"Be an Iron Major."*

My first two days I followed the scaled WODs found under the "Start Here" tab, before deciding to follow the WODs on the main site. Determination became my best friend as I struggled to get through the warm-up, using the Gravitron machine for nearly all the pull-ups and dips. The WODs were worse. My mechanics and form on Olympic lifts were worse than awful; they were non-existent. Each day began for me at 10 pm when the next day's WOD would post—followed by research on the exercises and workouts. I couldn't sleep some nights, filled with anticipation of the next day's WOD, figuring out how I could move equipment in the MWR gym to complete the WOD.

On January 8th I did "Cindy" for the first time. Three rounds as prescribed before I had to use the Gravitron machine to complete another eight rounds. I looked at the message board and could not believe what I read—twenty rounds was considered "good."

On January 15th I did what would become my personal and favorite workout: the "Filthy Fifty." What a train wreck that was! 51:09, and nothing was done right. My knees to elbows were simply knee raises. I had to use a 12-pound ball. I wish I had my burpees on video—I moved a mat over so I could collapse on it, do a push-up, crawl to my feet, jump and clap. After completing 100 singles instead of double-unders, I threw up. I had to pull my truck over on the way home because I kept blacking out.

I was hardly an "Iron Major." I was a weak slob who could talk a good game about Army stuff. I needed to do better. I knew I could.

Nowhere to Go but Down

In a few weeks I started to see improvement. "Cindy" showed up again on January 28th and I was able to do 12 rounds, as prescribed. My confidence was starting to build. I didn't have the equipment to do the WOD posted on February 8th, so I substituted "Filthy Fifty" for it – 50:53. February 14th brought my first "Fran." Having to substitute 55 pounds for the thrusters allowed me to complete it in 9:47. On February 29th I met "Murph" and finished it in 56:59.

A month later I began to see the results. The "Filthy Fifty" reared its head again. This time I was able to get through everything as prescribed, except the double-unders, in 43:06. I was elated—I wrote "BIATCH!" in my logbook. The results were there after 60 days. After 90 days I clocked another "Filthy Fifty," this one at 35:12, with half the number of prescribed double-unders.

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Ninety days since starting CrossFit, I took my first Army Physical Fitness Test. The APFT consists of max reps of push-ups in two minutes, max reps of sit-ups in two minutes, and a timed two-mile run with a score assigned for each. I was able to execute 85 push-ups and 81 sit-ups – both for a hundred points each, and ran the two miles in 14:10, for 92 points. 292 is not too bad, and I was happy. My weight was down from 201 on January 3rd to 186 on April 15th. Then, on May 10th I completed "Fran" for the first time as prescribed, in 9:31. No, not an elite time, but I finished it as prescribed. I felt pretty good about where I was.

I felt as though I was no longer just a guy who did CrossFit. I was becoming—in fact, had become—a "CrossFitter."

About a week later, I posted a twenty-round "Cindy"—a "good" score. But something more than good times and good scores was happening to me. I felt as though I was no longer just a guy who did CrossFit. I was becoming—in fact, had become—a "CrossFitter."

CrossFit wasn't just a part of my day by then, but had become a part of my life.

I started buying rings and kettlebells, building plyo-boxes and parallettes, and looking at how to get to a Level 1 certification. My confidence in my performance got to the point where I started to attend the morning WODs with the DMI "CrossFit Crew." A fat tanker with airborne rangers—and I was right there with them some days. It felt good— I no longer felt as though I was a weak slob.

On May 28th, I smoked my 22-year-old brother-in-law, a cadet here at West Point, in the posted WOD by five minutes (5 rounds for time of 25 of each: 2 pood kettlebell swings, sit-ups, back-extensions, and knees-to-elbows). I still haven't let him forget.

During the summer months, our department would meet and conduct PT every Thursday morning as a group. On June 26th, I was responsible for our department's morning PT. I filled various-sized ammo cans with dirt, made medicine balls out of sandbags, and put the department through a field-expedient "Fight Gone Bad." The morning DMI CrossFit crew loved it; everyone else hated it. It was absolutely beautiful. The following day I clocked a 36:22 "Murph." Writing "PR" next to my times had become a habit.

On July 11th, I was able to complete the "Filthy Fifty" in 24:15, this time 100% as prescribed.

I couldn't believe how far I had come. My weight was 185 pounds. Fran, Nancy, Helen were my constant companions. My now-pregnant wife, recently returned from deployment to Kuwait, pleaded with me to STOP talking about all these other "women."

Building Bodies —and Leadership

On July 20th I was able to use CrossFit for the first time as a direct leadership tool. During the summer training period, I was assigned as the Officer-in-Charge of a group of returning graduates—Second Lieutenants—ordered to assist as trainers. One of these lieutenants failed an entry run for the US Army's Air Assault School. He was given to me to "fix." In the initial counseling, I learned he had a background with Olympic lifts. Perfect. I administered a diagnostic APFT, which he failed, scoring 187 with 59 push-ups, 58 sit-ups, and 18:56 on his run. He also failed to meet height-weight standards with a 26% body-fat content. He was now officially my "project lieutenant." My first leadership experiment with CrossFit had begun.

On the first weekend of August, I earned my Level 1 cert in Virginia Beach. But I knew—as did the other officers from West Point who attended—that this was really JUST the beginning. Major Dan Blackmon and I resolved to follow the guidance of Pat Sherwood, the cert instructor, and observe a strict Zone diet for the next month. When we got home, I started my second logbook. Again I wrote, "Be an Iron Major," on the inside of the front cover.

I returned to morning WODs with my "project lieutenant." On August 15th, less than a month after he started CrossFit, I administered another APFT. This time he scored 236, improving his push-ups to 69 reps, his sit-ups to 63 reps, and his 2-mile run time to 16:06. His body-fat content was down to 23%, meeting the U.S. Army's standard.

Dan Blackmon sent in the application after returning from the cert and a few weeks later it came back approved. CrossFit West Point was a reality. Dan built a website to post daily WODs.

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CrossFit really began to change for me at this point; no longer just an exercise program, it became a leader-development tool. CrossFit West Point became a vehicle to interact with cadets essentially as peers. The word started to spread on CFWP. More cadets started showing up at 0530 for the morning WOD and the posts to the CFWP site began to grow.

The Level 1 certification didn't necessarily give us any special increased knowledge about CrossFit—most of the lectures are posted as video clips on the main site—but it did give us an opportunity to build an environment to interact with cadets on a very personable and real level. To quote Colonel BP McCoy, "There's no striking a bold leadership pose after you do 'Fran'."

The norm for the faculty that does CrossFit is to do it with cadets, whether it is a single cadet or a group. Major Shawn Bault, an instructor in the Department of Physical Education, began discussions with the senior faculty about a location within the Cadet Physical Development Center (Arvin Gym) dedicated to cross training.

While the momentum here at West Point continues to grow for a "cross training" area, my times continue to drop, and my rounds, reps, and strength continue to increase. Using only CrossFit to train, I completed the Army Ten-Miler on October 5th in 1:28:13, an 8:49/mile pace. It is the longest I have ever run in my entire life.

Weighing 176 pounds on October 14th, I missed scoring a perfect 300 on my APFT by four seconds on the run. I finished the two-miler in 13:22; I needed 13:18 to max the text. Every second counts, huh?

"Would you have more confidence and trust in your company commander if he was a CrossFitter?"

In the beginning, it was all about the weight for me. Now I worry if I am losing too much weight; I had "leaned out" at 172 and my performance sputtered. I barely even get on the scale anymore, once a week maybe, because it's right there in the bathroom. It's the first time in years where I haven't been obsessed with, "How much do I weigh?" I've been at 175 for two months now, but that's not my main concern. It's all about posting PRs now, getting stronger, breaking ten minutes on "Helen," six minutes on "Fran." I'm at 17 blocks now—that's where I'm at. I'm at the point where things that used to concern me don't concern me. I'm teaching my five-year-old girl to hold a handstand—she likes to do squats and play on the parallettes. I use what I know about nutrition to make sure my wife is eating right during the last trimester of her pregnancy. What is great is that I introduced my brother-in-law to CrossFit, and with that he'll touch forty soldiers in his first assignment as a platoon leader after he graduates in May.

On October 22nd, I had lunch with a group of cadets that were invited to attend a Level 1 certification. These three young men have been assigned to complete a series of articles for the CrossFit Journal in return for their invitation to the cert—more than a fair trade. I reminded them about the points made by Colonel McCoy, in a posted video clip, about mental toughness and discipline. I sat down with them to go over research questions for their upcoming assignment, one of which was a simple, "Would you have more confidence and trust in your company commander if he was a CrossFitter?"

I already know the answer to that one.

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About the Author

James Maxwell is a Major in the US Army assigned to the Department of Military Instruction and teaches a course on Officership. He is CrossFit Level 1, CrossFit Gymnastics Level 1, and CrossFit Nutrition certified. He leaves West Point this January to attend the Command and General Staff College at Fort Leavenworth, Kansas. He is no longer a fat-ass tanker.

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Up To My Ass in Crevasse

Swallowed by a freezing fissure in the earth, he counted on CrossFit

Vince Shimp, as told to Paul Eich

Vince and climbing partner Shaun Kennedy at the summit of Castle Peak, CO, 14,265 feet.

On Saturday, August 2, 2008, my life got interesting. It's not that I live an uninteresting life, but I discovered that being 25 feet under ground, with blood in my eyes and melting ice water for a blanket, fully captures one's interest. Among many thoughts I had, one that literally kept running through my mind was, *"Thank God I CrossFit, because this is what's going to get my ass out of here."*

My friend Shaun Kennedy and I had set out to climb Castle Peak (14,265 feet), just outside Aspen, Colorado. We reached the summit from our starting point of 11,200' in 2 hours, 45 minutes, and were sitting on the top at 8:45 AM. We completed the most difficult portion of our descent and were walking across a flat, snow-covered basin. One instant I was fat, dumb and happy, the next instant it was dark and I was falling.

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I wasn't afraid; it was too sudden for that. The snow under my feet had simply, instantly disappeared and I now was traveling straight down in a void, an empty space, out of my control. I was knocked on the forehead as I initially plunged beneath the snowy surface I'd just been standing on, and then I was sliding and falling. It was too dark to see, but I was falling just long enough to understand what had happened—and hoped I would get to wherever I was going before too much longer.

The stop wasn't sudden or jarring. I just wasn't falling any more. It took a couple moments for my eyes to adjust to see my new surroundings 25 feet below the surface. I discovered I wasn't at the bottom of what I realized was a crevasse, a giant crack in the earth; there was maybe another 10 feet under me. Due to the V-shape of the crevasse, my body and pack wedged me to a stop before I reached the bottom.

I was a little dazed. Taking stock, I knew had taken a hard shot to the skull. I couldn't see well. Water was running down on me. I wondered if the impaired vision was due to banging my head. I rubbed my eyes to try to clear them, and that was when I realized it was my blood that was making it hard to see. It didn't take a lot of analysis to realize this was a serious situation. I didn't know the full extent of my injuries, and suppose it didn't matter except to say that I knew I couldn't let them be a distraction from getting topside.

Shaun had made vocal contact with me by this point, but we could not see each other. He told me he would look and shout for other climbers to see if anyone was carrying rope. We had only seen a few others during the course of the entire climb. From the vantage he had, I knew he would have been able to spot almost anyone within close proximity. When he yelled down and said he didn't see anyone, I started to feel really uncomfortable with the situation.

There's no denying it: I was frightened. I couldn't see any way of getting up the solid vertical face of the crevasse on my own. There was no way to use my feet or to climb. I knew it was unlikely that other climbers would have a rope. It was a two-hour hike to be within range of the nearest cell tower. Assuming Mountain Rescue could be raised, their response time would have dragged the rescue out much longer than I wanted to think about. I struggled as panic tried to force its way into my mind. I consciously put panic and fear in the back of my mind, knowing it would prevent the clear thinking I needed.

Meet the Shimps, hard at work enjoying the Rockies

To get the full benefit of a glissade descent, I had donned a pair of shell pants. But I had no other protection from the water falling on me; I was being rapidly drenched in 33-degree water. Several feet above and in front of me was a large block of ice wedged into a bridge partway down the walls of the crevasse. I wanted to get underneath that bridge to shelter myself from of the water. The walls of the crevasse were not quite vertical near my feet; there were a couple of ledges I could rest them on. I pushed on one side of the crevasse, pressing my back and pack into the other, to keep me from dropping any further down, and was able to make it the sheltered spot. There was only enough room on the small ledge below this ice block for one foot, so I had to stand and balance on my left foot while I leaned against the wet, icy wall. This is where I stayed for most of the time in the hole.

It was hard to communicate with Shaun due to the depth of the crevasse and the loud sound of the melting runoff water. Also, he had no way to determine the boundaries or orientation of the crevasse and was rightfully concerned about getting too close to the hole I created. I'm glad he was careful, as it would have been inconvenient to say the least to have him drop in on me unannounced.

The Ups and Downs of a Professional Ski Bum

You might wonder what brought me to this fateful day. After I graduated from Michigan State University, I moved to Aspen, Colorado in 1989 to pursue a life-long dream of being a ski bum. I have my dad and Warren Miller to thank for that. I live in a town called El Jebel, just outside of Aspen. During the summer I own and run a small business that I started in 1995. During the last 14 winters I've managed Snowmass Sports, a ski shop in Snowmass. My wife Susanne and I have been happily married for 16 years, and we have two children, ages 8 and 11. Both of my youngsters enjoy CF workouts with me in our garage gym, and one of the benefits of being a professional ski bum is that my kids get a ton of snow time and are well on their way to mastery of snowboards and such.

I've been climbing for years, but I would describe myself as a recreational climber. The type of climbing I do isn't what you would call technical climbing, involving anchors or ropes or any specific training. Some of my climbs are fairly exposed, and a slip or having a handhold/foothold pull loose could result in a potentially fatal fall. Climbing for me is just one of several ways to enjoy the beauty of the Rocky Mountains. Skiing is my real passion, but I also enjoy mountain biking, hiking and camping.

I have been CrossFitting for a little more than a year. I was flipping through a Men's Health magazine and found a compilation of the best online fitness sites. After spending some time on CrossFit.com, and reading the CFJ articles "Foundations" and "What is Fitness," I was impressed with Coach Glassman's descriptions of CrossFit. I started following the WODs shortly after that. I don't have a favorite at this point, but the ones that I enjoy most are WODs I've never seen before. When I look at the times posted on the main site, I think my Murph time, 33:58, holds up as one of my strongest in relation to other CFers.

I follow the main site WOD. I started out training in a small local gym. I think it had a total of 3 barbells, so days when I did Linda I became pretty unpopular there. After that gym closed, I decided to build a garage gym, and then I decided to affiliate. Right now, Roaring Fork CrossFit is a place for myself and my friends to work out and an opportunity to introduce CF to this area. I've registered for a Level 1 Certification in October in Golden. I'm looking for the opportunity to get into a larger space.

That's my story and that's why I was out hiking with Shaun. So you could say being up to my ass in crevasse was a hazard of my chosen profession.

Muscle-up... or else

After some time had passed, Shaun had made contact

with some other climbers on the mountain. A guy named Spencer was trying to improvise some lines to reach me. As I waited, I never let myself think "I may not get out." I had no idea at the time, but maybe a dozen or so people had gathered and were donating any material they had to make two lines. No one was carrying rope, so Shaun connected belts, wrist leashes from everyone's ice axes, pieces of webbing torn off packs, and even a dog leash.

Since the group could not see me, they lowered a line a couple times and asked if it was within my reach. It wasn't—unless I could get myself up on top of the ice block. It appeared that I would have to do that, since it seemed that the lines were as long as they could make them. I leaned backward a bit and found I could reach high enough to get my hands and forearms on top of the block of ice. I was going to have to do a muscle-up. I was not happy about that at all.

You see, the consequences of doing a muscle-up—and by the way, I cannot yet do a ring muscle up—onto a wet block of ice with a fairly high probability of slipping off were not good. Not only would I take another ride down, but this time I would be *upside-down*. Perhaps worse, I would then be absolutely out of reach of my lifeline. I didn't know how long I could hold out in the cold, wet bottom of the crevasse.

But being a positive person, the rewards side of the equation set my course. I wanted out now. So I reached my hands and forearms up on top of the ice bridge, got enough leverage, and muscled myself up to the top of the bridge without falling. What a huge relief! The lines were now within my grasp. All I could think to myself at that moment was, *"Thank God I CrossFit."*

"CrossFit like your life depends on it because someday it might."

I'd been in the hole 90 minutes. I put on my nylon shell top, then tied my backpack on a line and had them pull it up first. I didn't want it to catch on anything on the way up, and needed to shed the extra weight. Then I looked at the freezing cold runoff water dripping down the rope and the slick, vertical wall in front of me. I quickly realized that without handholds there was no way of pulling myself up these thin wet lines without losing my grip or missing a grab. I asked if they could put some loops in the lines, and they pulled the lines back up.

As I stood there waiting while they worked on the ropes, there was a moment when I knew there was enough material to reach me, and I felt a great sense of relief and confidence. Again, I was thinking to myself *"Thank God for CrossFit. This is what's going to get my ass out of here."*

Another glitch became apparent as they lowered the lines after adding the loops: I could not reach the lowest loop because he bottom of the lines were at about chest height. No problem; I took off my belt, made of webbing, and latched it to the bottom of one of the lines, creating a sling to step into. I knew without a doubt I would be able to pull myself up and out. I think for many, if not most people, this might not even have been an option.

With the limited amount of material we were working with, the lines had to be anchored right at the edge of the opening. The lines were tied off to two ice axes which were sunk into the snow, and Shaun and Spencer were laying on top of the axe handles to prevent them from pulling out. I yelled up and asked if they were ready, put my foot in the belt, and stepped and reached for the first loop. Once I had the first loop in my grip, it felt like I flew up the lines. I'm sure there was some adrenaline involved, but at no point was I concerned about whether I would have the strength to make it all the way. In fact, I flew up the lines as fast as I could, thinking the less time I was suspended, the better. I could pull far enough to get my arms and torso above the snow crust, and from there, Shaun and Spencer grabbed me and pulled me out.

I've been asked if it was a Hollywood moment as I got out, but it wasn't. I was covered in blood—as soon as I was visible to the crowd of about a dozen people, a lady called me over and opened a first aid kit. When she got a good look at me, I could tell by the look on her face it wasn't pretty. I suppose she didn't like the look of my gleaming skull. Nevertheless, she patched me up and got me ready for the descent.

Afterwards, a number of potential outcomes ran through my mind. The worst of those was "what if I had been climbing alone?" I was actually planning to make the climb alone if Shaun had not been available to join me that weekend. The next worse possibility, which was very real and my biggest concern at the time, was, "What if the rest of the snow bridge across the crevasse collapses in on me, knocking me further down and burying me at the bottom?" Several large chunks of snow and ice from the underside were breaking loose and falling to either

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side of me. My fall through had definitely compromised the integrity of the snow bridge, and the heat of August wasn't helping. I would also have been in deep, deep trouble had I injured one of my arms. Thinking of what could have happened, it seems to me that there was an interesting mix of good and bad luck involved in falling in and in getting out, not the least of which was finding the article about CrossFit.com.

I found out at the hospital I had a two-inch cut through my eyebrow right to the skull, and there were several more cuts in my face and head. I don't think my wife was too surprised to get another call from me from the emergency room. I think (and hope) it's difficult for the kids to comprehend the situation.

My rescue was not reported in the local paper, probably because Mountain Rescue was not called. I posted a trip report here to warn others of the hazard since it was on a fairly well-traveled route. This is a thread (with photos of the area) started by another climber who happened to come upon the rescue. I also posted a version of this story to CrossFit.com comments (#431).

I feel very grateful to Shaun Kennedy and for those who contributed rescue materials. Perfect strangers, which they were in both senses of the word, stayed with me for the descent. They made sure I got off the mountain safely. I was extremely lucky those people were there and chose to rescue me, but I'm not surprised they helped; that's how people are around here.

As I think back about the day, I have thought of "easy" and "important." It strikes me that the easy part of being prepared is making sure you have the right gear and equipment for the most likely circumstances. We were carrying gear for everything from fire starting to first aid to emergency overnight shelter. The one thing we didn't have, nor did any other climbers that day, was a rope. It just wasn't something you'd carry on that sort of a climb. By contrast, the most important part of being prepared is being best prepared for any physical contingency that you may face. Being physically prepared is not easy; you can't buy that at REI.

I'm 41 years old, 6'3" tall and I weigh about 200 pounds. I'd already spent the energy to hike and climb for over four hours, including a serious ascent at over 10,000 feet MSL. Getting myself up 20 feet of a makeshift rope, while injured, after a 90-minute ice water shower, with wet, cold hands, and nothing but ice walls to push against was no small challenge. I think of Coach Glassman's comments on CrossFit: *"Our specialty is not specializing. Combat, survival, many sports, and life reward this kind of fitness and, on average, punish the specialist."* I don't think bodybuilding, triathlon training, cycling, or other specialized approaches to fitness would have helped me get my ass up the makeshift rope and out of that crevasse. That's what CrossFit is all about.

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About the Author

Paul "Apolloswabbie" Eich is a CrossFit Level-2 certified instructor. He is in his nineteenth year of service as a Naval officer and has logged over 3,000 hours in U.S. Navy aircraft. Paul trains in his garage gym and at CrossFit Memphis.

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Meth in a Can

Irritability. Heart arrhythmia. Osteoporosis. Withdrawal pains. The huge quantities of stimulants in energy drinks can make them as risky as "real" drugs.

Keith M. Graves

It's hard for longtime CrossFitters to forget the article "Getting off the Crack," which ran in the October 2005 edition of the Journal. Part of the reason is the striking photo of author Nicole Carroll's beautiful abs, but mostly it's her revelation that food can be much like the very addictive drug, crack. She relates how certain foods are bad for our health and performance, why we crave them, and why we need to stop eating them now.

It got me thinking about a related and insidious problem: the influx of energy drinks on the U.S. market. Many people have come to accept and use Red Bull and its clones on a daily basis. I want you to walk away from reading this by remembering one thing: energy drinks are simply meth in a can. Yes, meth—methamphetamine, a highly addictive central nervous system stimulant. The more meth you take, the more you crave it and the more you need it. The same thing applies to energy drinks.

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What's Inside a Can

Caffeine

Caffeine is a central nervous system stimulant discovered by a German chemist in 1819. It can be found in beans, leaves and the fruit of some plants, where it acts as a pesticide by killing certain insects feeding on the plants. It takes less than one hour for the stimulant effects to take hold in the human body and can last up to four hours.

Taurine

Taurine is an organic acid found in the lower intestine and in small amounts in the tissue of animals and humans. The average intake of taurine in a person's daily diet is approximately 100 mg. Energy drinks provide anywhere between 250 mg and 4000 mg of taurine. Not a stimulant itself per se, taurine is a vital, naturally occurring compound in the body that in energy drinks is often paired with stimulants (like caffeine) because it helps to keep a stimulated body under control. It reduces muscular fatigue, aids thermoregulation (stabilize body temperature in physical activity), improves concentration, and relaxes the brain.

Guarana

Guarana is a plant found in the Amazon Basin that produces flowers and fruit in clusters. One seed from the fruit of this plant contains as much as five times the amount of caffeine as a coffee bean.

Ginseng

Ginseng is a slow-growing perennial found in Asia. It is often used as a stimulant, much like caffeine.

L-carnitine

An amino acid produced by your liver and kidneys, L-carnitine assists with increasing your metabolism and energy levels. Supplements of this substance are not allowed to be imported into Canada.

Some people might think that this is just hyperbole. Some think there is no way that you can compare energy drinks and supplements to meth. But the fact is that some of the more common ingredients in energy drinks are serious stimulants, including caffeine, taurine, guarana, ginseng, and L-carnitine. (The sidebar to the left details the effect each ingredient has on the body.) On top of that, one can by itself often contains these stimulants in amazing quantities—as much as three to four times the amount of caffeine in one cup of coffee. And caffeine is typically just one of several stimulants present.

Most energy drink supplement companies often use the extreme amount of these stimulants as a marketing tool. Names tell the story. One company sells their energy drink by the name "Cocaine." Other brand names include "Amp" and "Wired." But the charge they give you is fleeting and the negative after-effects linger far too long

Energy-Drink DUI?

As these drinks began crowding the market, I began to wonder if someone could appear to be "under the influence" of these stimulants, much like being under the influence of meth. Sure enough, I was teaching a class of police officers recently about how to identify people who are high on drugs. During the class the students, all current police officers, were practicing their new skills by administering sobriety tests on one another. As they were practicing, one of the students was joking that his partner was high on meth.

Everyone in the class was a police officer, so you would hope they weren't actually using meth. But, I did notice that the young, laughing student was actually drinking a nice, tall can of Rockstar, a popular energy drink, just before the exercise. I noticed that he did show some signs of drug influence, so I asked this young officer what energy drinks he'd taken that day. The answer was alarming. That morning he had already downed a 16-oz. can of "Rock Star Energy Shot," a packet of "Zip Fizz," and two other "energy supplements" to help him stay awake and provide energy for his morning workouts.

I decided to a do a drug influence evaluation on the officer, since the consumption of the energy products had been fairly recent. I wanted to see what effect the energy drinks and supplements would have and to see how it compared to someone under the influence of meth.

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I found that the student had the signs and symptoms of drug influence. His pupils were dilated and his pulse elevated, and I saw muscle tremors. These are signs of methamphetamine influence. The only thing missing was the massive euphoria that meth users feel when they ingest their drug.

When I sit in briefings, I notice that a number of officers are drinking energy drinks. When I go to the gym, I notice that a lot of people are drinking energy drinks during their workout. The final straw: watching a Little League coach give his 12-year-olds Red Bull just before the game. That's just what you want, isn't it? A bunch of 7th graders hopped up on caffeine, and not able to function after it wears off one hour later!

The general population does not understand the growing dangers that these drinks and supplements pose. And I do mean growing. With energy drink sales up 55% a year and annual sales exceeding $5.4 billion dollars (yes, billion) in 2006 (source: USA Today, 2008), the energy drink makers can afford a hefty annual marketing budget.

So why are energy drinks so bad for you? Let's compare: A normal cup of coffee has 80 mg of caffeine, a can of Coca Cola has 34 mg, and a Pepsi 37.5 mg. That's nothing compared to energy drinks. 8.3 ounces of Red Bull has 80 mg; comparable 16-oz. cans of Rockstar, Monster, and Full Throttle have 160mg. Starbucks Grande coffee has 330 mg; Wired 344 mg. And this is without counting the other stimulants in the drinks.

Revving You Up and Wearing You Out

It is important to understand what so much stimulant does to your body. Intake of more than 400 mg of these stimulants can lead to a number of nasty side-effects: nervousness, irritability, problems concentrating, sleeplessness, muscle tremors, increased urination, abnormal heart rhythms (arrhythmia), decreased bone density, and an upset stomach. These stimulants may also slow the body's ability to absorb water, leading to dehydration.

There is no requirement from the FDA to list the amount of caffeine in these drinks, so you may or may not know how much you are getting. As a rule of thumb, no one should drink more than one energy drink per day. However, I recently saw an energy drink with 2 grams of stimulant blend—that's 2,000 milligrams (mg)! Compared that to 80 mg in a cup of coffee!

Do you need to worry that it will affect your athletic performance or your health? Absolutely! In France, the legislature outlawed energy drinks after the death of 18-year-old Irish basketball player Ross Cooney just after he finished a game. He had consumed four Red Bull drinks prior to starting time.

There has been an increase in emergency room visits due to intoxication from energy drinks. And more importantly, a California man was recently arrested for DUI. What was his intoxicant of choice? Five energy drinks in an hour and a half.

Looking at the side-effects of some of these drinks, I am still shocked at the number of athletes and warriors (my fellow police) who will tell me that they use the energy drinks to help them stay awake and alert. Ironically, it does not actually accomplish this. It really has the opposite affect—and could be detrimental to them when danger comes their way.

The stimulant that you take is not getting you the 'boost' that you are seeking and it hurts you in the long run. When you take caffeine or another stimulant into your body, it activates your adrenal glands and releases hormones in your body like adrenalin, norepinephrine, and cortisol. If you take these stimulants, they are addictive and you will build a tolerance to them. Soon, you will need to take more and more of the stimulant to achieve the desired effect, such as getting your 'boost.'

As you take these stimulants on a daily basis, you will cause adrenal fatigue or, simply put, exhaustion. Therefore, the energy drink you are taking now is basically making matters worse for you. Over time, it will burn you out and make matters still worse. On top of that, there has been an increase of metabolic syndrome, insulin resistance and diabetes. This increase can be attributed, at least in part, to adrenal over-stimulation.

Normally, your body doesn't get stimulated until you're put into a stressful situation, at which time it will release adrenalin from your adrenal glands. This gives you the 'boost' you need at that particular moment. Examples would be running from a car about to hit you, reacting to gunfire or defending yourself from an attack. If you're not a cop, think of the moment that a police officer pulled in behind you when you were speeding.

Even a single cup of coffee can cause the release of these hormones. Continuing this release puts stress on the

adrenal gland. Your adrenal gland just is not meant to release so much of the hormones over time.

No Compromises: Get Off the Meth

Many of you who use these products may already have a basic understanding that these drinks and supplements are bad for you. You may have experienced some of the unpleasant side-effects I listed earlier. But now that you are more informed, it is time to get off the meth. It is not going to be easy. Just like meth, these substances are addictive and habit-forming.

What can you expect when stopping the use of these drugs? Answer: Caffeine Withdrawal Syndrome (CWS).

According to a recent Johns Hopkins study, CWS may be listed in the next edition of the DSM (the Diagnostic and Statistical Manual of Mental Disorders), which is considered the bible of mental disorders. According to the same study, as little as one cup of coffee a day is enough to cause CWS. You may experience fatigue, problems with concentrating, and irritability and headaches.

Just like other stimulant drugs, cessation of use will cause withdrawal symptoms and a craving for more of the stimulant. Withdrawal symptoms should subside within two weeks.

Energy drinks have become a part of our culture and have become widely accepted. CrossFitters live a healthy lifestyle and pride themselves on their level of fitness. They don't want to be told that they have been duped and have been hurting their bodies. However, this stuff is poison and can lead to a whole slew of health problems.

I have seen too much to condone halfway measures on this issue. People using energy drinks are killing their health and should stop immediately. I know I sound militant, but this stuff is harmful and is doing us no favors.

Bottom line: These drinks are meth in a can. If you see someone using these products, help them get off the meth. If you use them yourself, get off the meth. After all, if you're sipping the Kool-Aid of CrossFit, you don't need more stimulation.

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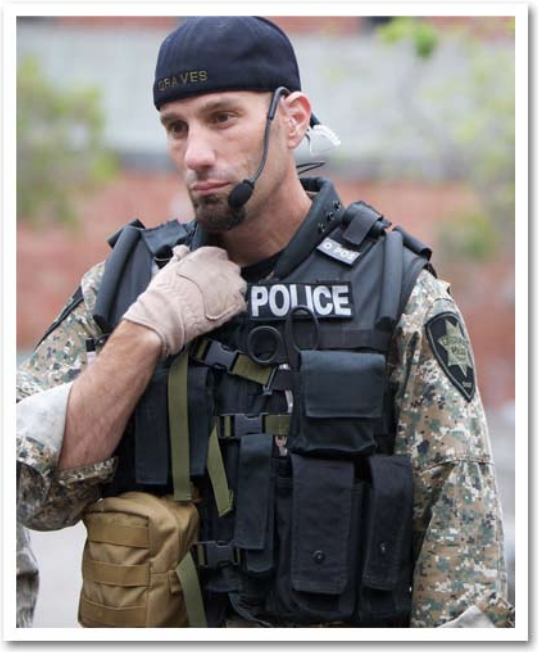

About The Author

Keith Graves is a certified Level 1 CrossFit Trainer at MMCrossFit in Livermore, CA. A police officer assigned to both the Narcotics Unit and the SWAT Team, Graves is a certified Drug Recognition Expert Instructor (#3292), a court-certified expert in stimulant influence, and a teacher of drug influence courses for the California Narcotics Officers Association since 2000. He often contributes under the pseudonym "12bravo" on the CrossFit blog.

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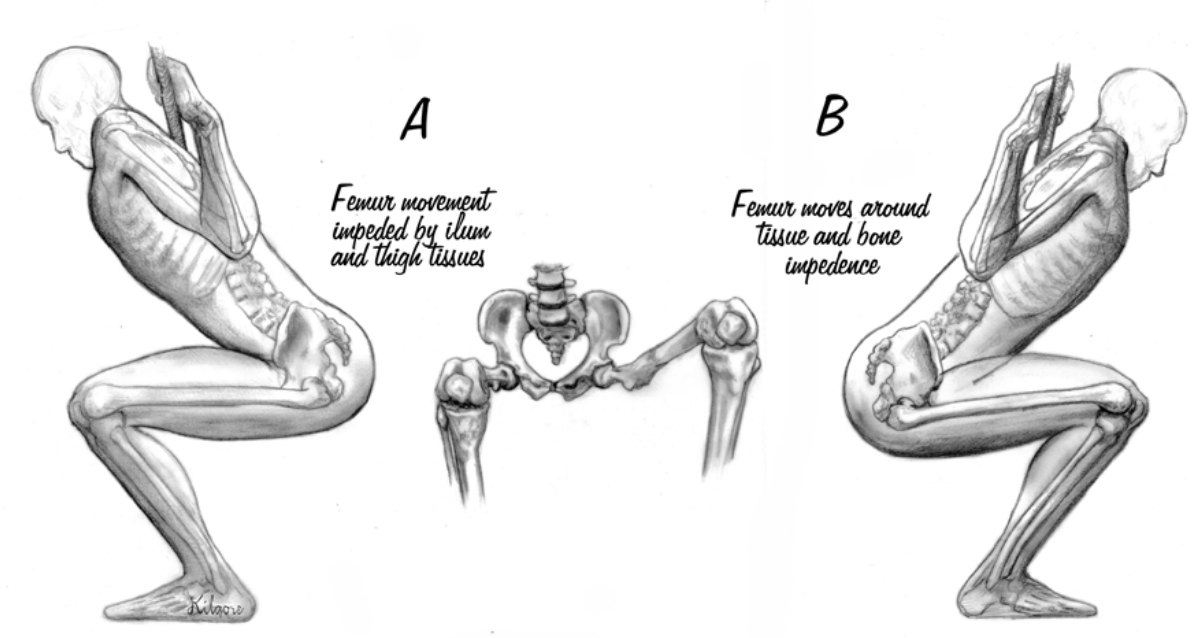
You don't know Squat without an "Active Hip"

It's powerful, safe and easy to do:
Aim toes out, push knees to the side, arch the lower back, and blast off.

Mark Rippetoe and Dr. Stef Bradford



The anatomical details of the skeletal aspects of "hip impingement."

The term "Active Shoulder" (CrossFit Journal Sept. 2005 (37):13). has been used to quite effectively describe the proper motion of an overhead press—in short, when the shoulder girdle muscles, starting with a concentric contraction of the traps, end up supporting the weight in a way that places a balanced load over the scapulae, thereby protecting the soft tissue of the joint from impingement. Since I find that concept of the active shoulder very useful in teaching the press and its variations, as well as the snatch and the overhead squat, it always made me wonder: Is there was an equivalent concept available for cleaning up the problems associated with the squat?

Well, it turns out that there is. And just for the sake of making a nice little pattern, I call it the "Active Hip."

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When we squat, the standard range of motion criterion for the exercise is "below parallel," defined as the hip joint identified at the apex of the hip angle (the "corner" in your shorts over the hip) as it drops below the knee (the top of the patella). Most people that have trouble with the squat are having trouble getting good depth while keeping their low back from rounding. Pretty much anybody can get deep if they allow the lumbar spine to relax into flexion, a phenomenon known in some circles as "butt wink." But I have found that almost every single human being on this planet can squat below parallel with pretty good back position if their stance is correct and if they simply shove their knees out to the sides at the bottom. This is because a type of impingement occurs at the bottom of the squat that is relieved by shoving out the knees, and at the same time an improvement occurs in the way the hips work.

Stef, who is much smarter than I am, occasionally walks up to me and says things that cannot be ignored. That's not because she says them in a clear, strong voice, but because they make such perfect sense that you have to say to yourself, "Why is it that *she* said this before I did? Am I that *dull*? This is so damned obvious that I must now begin to question my ability to reason and observe. Maybe I'm drinking too much, or not sleeping enough, or something..."

That brings me to the day that Stef walked up to me one day and made the following observation: "You know that the femur impinges on the hip pointer at the bottom of the squat if the knees aren't out of the way, in the same way that the acromion process of the scapula impinges on the humerus in the press if the traps aren't shrugged, don't you?" She said it like I was a moron for not having said it first. I had to agree.

Toes and Knees Angled Out = Good;
Straight Ahead = Bad.

If you stand with your heels at shoulder-width apart and point your toes out at about 30 degrees, squat down, and keep your thighs parallel to your feet, that's perfect: As your hip angle closes and your thighs approach your torso, your femurs will track to a position that is *outside* of the anterior superior iliac spine (AIS)—the hip pointer that you feel right below your waistline.

However, if you point your toes straight forward and let your knees follow your toes, or even if you point your toes out but still let your knees cave in toward the middle when you squat, you'll run into problems. As you squat down, your femur will approach the AIS as you approach the bottom. If your thighs jam into your belly, it tends to trap any soft-tissue structures that may be in the area between the thigh and the hip pointer. If you have a big gut (that famous 60 pounds of undigested red meat, perhaps?), or big thighs, or a lot of clothes on, this will keep you from obtaining a below-parallel squat.

And if you try to continue to drop down to get better depth, it will happen at the expense of a rounded lower back, since the hip angle cannot become more acute if the femur is trapped against the ASIS. If the pelvis—which is supposed to be locked into the lordotic curve with the lumbar vertebrae—can't tilt forward to maintain this position because it rams into an obstruction formed by the femur, the only way to keep going deeper is to round the low back into lumbar flexion. The obstruction occurs before the bones actually touch, of course, since the hip flexor origins lie in between. So everybody will experience this phenomenon to one degree or another, and everybody who cannot get below parallel with an arched low back has this problem.

If you're having depth problems, shoving the knees out fixes it so often that it is waste of time to do anything else first.

A comparison of the effects of the active hip position and the knees-forward position on the lumbar extension of 2 people at the bottom of the full squat.

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Most people won't do the job of keeping their knees out unless they're coached to do so, often and loudly. The knees want to track more medially than this because of the tension on the inside of the femurs produced by the adductors—the groin muscles. These five muscles (the adductor magnus, adductor brevis, adductor longus, pectineus, and gracilis) attach at various points along the medial and posterior aspect of the femur, and on the ischium and pubis of the pelvis. Tension is produced between these two bones as you squat down and keep your knees out; this is eccentric contraction for these muscles, since they lengthen as the femur maintains its position parallel to the feet. As you come up out of the squat, the distance between the inside of the femur and the medial pelvis shortens as the hip angle opens up; the concentric contraction of the adductor muscles thus produces hip extension.

Visualize this by imagining a point at the end of the inside of your thigh down by your knee, and another point on your "seat bone," under your butt and behind your crotch. These points represent the attachments of the biggest adductor, the *magnus*. Since your back is locked in extension by your spinal erector muscles, and the back of your pelvis is locked in position along the line of your back by these same muscles, as you squat down and make your back more horizontal your seat bones rotate back and away from your knees. And if your knees stay in position, pointed in the same direction as your feet—out at about 30 degrees—the distance between the point on the inside of your thigh and your seat bone increases. And if this distance increases as you go down and decreases as you come up, the contraction of the muscles that got longer on the way down makes the coming-up part happen. This is how the adductor muscles function in a correctly performed squat, and why they are considered hip extensors, along with the glutes and hamstrings as part of the posterior chain.

Since the adductors tend to pull the knees in, what keeps them out when you use your hips correctly? If ***ad***-duction of the thigh means pulling the distal end of the femur toward the midline of the body, it seems like ***ab***-duction would be the movement used to keep them out, and that the abductors would be the muscles that did this. But the abductors consist of the tensor fascia latae (the TFL, a small muscle that connects the hip at the anterior iliac crest to the lower leg), plus the gluteus medius and gluteus minimus. Together they create hip abduction if you raise your leg out to the side away from your body. The trouble is that nobody actually does this except in biomechanics class.

Therefore, it would make more sense to assign the task of shoving out the knees to the external rotators of the hip. External rotation occurs when you make your right femur rotate clockwise and your left femur rotate counterclockwise, as when you stand up and rotate your toes away from each other balanced on your heels. The action of rotating the femurs out is what actually occurs when you drive your knees out on the way down to the bottom of the squat. Prove this to yourself by sitting in a chair and making the same muscle action on your femur as you would pointing out your toes while standing up. There are at least nine muscles that perform this function (the gluteus medius, minimus, and maximus; adductor minimus; quadratus femoris; inferior gemellus; obturator internus; superior gemellus, and piriformis), which is critical to stabilizing gait mechanics through the range of motion of the stride.

Using the above nine muscles to set the knees in a position parallel to the feet makes all kinds of sense when you consider that they are in an effective position to do it and the TFL is not (the minimus and medius are external rotators, anyway). (And while we're using parentheses, Nautilus had an extremely silly machine that exercised abduction and adduction of the hips in isolation, of course, from the rest of the hip function —cleverly designed, but utterly irrelevant to human movement.) So shoving the knees out of the way on the way down and keeping them there so that the adductors can do their job is accomplished by hip external rotation, and forms an important part of the active hip concept.

Explode up with the Stretch Reflex and an Arched Lower Back

When you intentionally shove your knees to the outside as you come down into the bottom of the squat, you not only get the femurs away from the ASIS; you allow the adductors to stretch tighter and position them to more effectively contract as they reach the limit of their extensibility. A tight, stretched muscle contracts harder than a looser, shorter muscle, because the stretch tells the neuromuscular system that a contraction is about to follow; a more efficient firing of more contractile units always happens when preceded by a stretch. This *stretch reflex* is an integral part of all explosive muscle contraction, and better athletes are very good at making it happen.

When we squat, the external rotators of the hip position the femur so that the adductors can participate with the hamstrings in the bounce. So the whole hip musculature contributes to squatting efficiency—*if you shove your knees out.*

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The bounce is the stretch reflex produced in the tightened posterior chain that you should feel when you stretch out the hamstrings and adductors at the bottom. It is an important part of the squat, both when loaded with a heavy weight and when unloaded as an "air" squat, when a rapid turnaround is important for timed exercises. When you use an *active hip*—deliberately keeping the knees out, or actively pushing them outward into a position parallel to the pointed-out toes with your pelvis locked in line with your arched lumbar spine—you make your squat depth more easily obtainable and your hip drive out of the bottom faster and more powerful.

The limit of the adductors' and hamstrings' extensibility will almost always be below parallel, as defined earlier. Some people lack sufficient extensibility in the posterior chain muscles, and some people have tight joint capsule ligaments. But more than stretching, people merely need the correct stance, the correct knee position outside the ASIS, and a loud reminder to keep their knees out. The weighted squat has few superiors in the realm of things that go *stretch,* and what little there usually is to stretch can most often be done within a few sets of weighted squats that incorporate an active hip.

"My good collegiate weightlifter and one of my older members both recently became the recipients of my head popping out of my ass one day, when it occurred to me that maybe they needed a refresher on arching the low back. "

It has recently come to my attention that a relatively high percentage of people, many more than I had previously thought, have no idea what the hell their low back is doing at any given time. My good collegiate weightlifter and one of my older members both recently became the recipients of my head popping out of my ass one day, when it occurred to me that maybe they needed a refresher on arching the low back. As it turns out, neither of them had ever consciously contracted their lumbar erectors, and didn't actually know how to do it. They had been relying on ligament tension and general trunk tightness, fine for very light weights but really a handicap at work set loads. If the lumbar spine and the pelvis do not stay perfectly rigid in what could be called "pelvic lock," force transfer is not as efficient up the spine, posterior chain rebound is soft, and back safety may ultimately suffer. My weightlifter subsequently did four PRs at a meet two weeks later; my other member was merely happy. We now include learning this simple movement very early in all Basic Barbell certs, where we usually find that about 15% of the people in attendance don't have voluntary control of their lumbar muscles.

Summary: Go Deep and Move the thighs

The concept of the *active hip* is best understood as the use of an actively locked lumbar extension and actively shoved-out knees, which results in a below-parallel squat that incorporates a stretch reflex using all the muscles of the posterior chain in the most optimal way possible. The active hip gets the thighs out of the way of the pelvis so that good depth can be more easily obtained. At the same time, it makes the squat stronger and more powerful because of the more effective use of more muscles over a wider range of motion.

The active-hip concept is also applicable in movements that don't elicit a stretch reflex. If a hip extension is involved in the movement, as it most certainly is with all pulls from the floor, the lower back obviously needs to be in pelvic lock and hard extension, but what is less obvious is the adductor and external rotator component. If the knees-out position can tighten up the adductors, they can function more effectively as hip extensors, and since hip extension is involved in any pull, a knees-out position can improve their participation in the pull. Since the range of motion of the hips in a pull from the floor is relatively smaller than that of the squat, their direct contribution is low, but any external rotation engages the adductors in a supportive/hip tightening role. This allows more precise control of movement at the hip (an effect that's easy to feel in the dip-and-drive of the jerk) and more effective transfer of force by the hip extensors that directly contribute to moving the load. Olympic weightlifters often employ this knees-out starting position to fix problems off the floor and allow for a better back angle.

Another thing that affects pulling from a more knees-out position is the effective shortening of the distance between the bar and the hips when the knees

are shoved out of the way a little. This modification of the effective length of the thigh makes a more vertical bar path easier to obtain off the floor. But even when the stance is relatively narrow or the hip angle relatively open, a little external rotation of the femur alters the balance of muscle action around at the hip in a positive way, helping with a more effective hip extension off the floor.

So next time you squat, whether loaded with a PR set of 5 or doing Tabatas, remember the concept of the active hip: just get your knees out of the way and lock your lower back into extension. It's as useful to your squatting as shrugging your traps is to your pressing.

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Coaches Mark Rippetoe and Greg Glassman at the CrossFit Certification Seminar in Santa Cruz, CA February 10, 2006.

About The Authors

Mark Rippetoe *and his buddy Phil do most of their squatting at his gym, Wichita Falls Athletic Club/CrossFit Wichita Falls. Rip has 30 years of experience in the fitness industry and 10 years as a competitive powerlifter. He has published articles in the* ***Strength and Conditioning Journal****, is a regular contributor to the CrossFit Journal, and is the author of the books* ***Starting Strength: Basic Barbell Training****,* ***Practical Programming for Strength Training****, and* ***Strong Enough? Thoughts from Thirty Years of Barbell Training****.*

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CrossFit Goes To College

Dedicated student CrossFitters are battling for legitimacy at the University of North Carolina

Juan Hernandez

The best part of my day starts the second that sweat from my chin splatters onto the gym floor, and the guys on Cybex machines shoot me nasty stares.

Is it because I'm a 5-foot-5 freshman here at UNC—the University of North Carolina—fabled home to athletic legends like Michael Jordan, and I can throw around more weight than most of them can ever conceive of? Or is it because my workouts involve stuff they've never seen before—like throwing medicine balls up against the wall and swinging dumbbells high up in the air and down through my legs as if I'm chopping wood? I don't know for sure, and don't really care.

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I've been pretty strong since the 8th grade, when I was a little fat boy and started lifting to get in shape. Growing up the oldest son in a Mexican family back home in Asheville, 3-1/2 hours away, I built myself up to 170 pounds with 11% body fat, played linebacker and offensive line on the football team, threw the shot, and have been doing a 300-pound bench and 500-pound squat for years. Now 18, no longer on a sports team, I spend most of my day studying Spanish and History—and keep working out to hold off extra weight. But I'm not just "staying in shape" anymore. Since I started doing CrossFit in August, I'm stronger than ever. My 5k time dropped from 31 minutes to 28. My arms and shoulders are cut like they've never been. My traps have gotten really big. And my back, my god! I never thought I'd have a ripped back. Never even thought about doing a pull-up before. Now I can do 20 in a row.

So stare all you want, gym rats. I'm getting fitter than I've ever been. Muscles taut from the workout, I leave the gym in full strut, my head up from the feeling of victory that I get whenever I finish the Workout of the Day.

And I am not alone.

University of North Carolina CrossFit activists (from left) Eugenio "Junior" Valdez, David Blumberg, and author-leader Juan Hernandez pose at The Well, a UNC landmark.

I heard about CrossFit over the summer from a buddy doing it at a YMCA back home, and started the workouts here at UNC during orientation week. At first it was only me, reveling solo in the pain like a monk in a monastery. After about a month, I ran into David Blumberg, a 6-foot-4 Sophomore, who's already pretty cut because he's been CrossFitting for about a year, and Eugenio "Junior" Valdez, who graduated from my high school the year before me; he started CrossFit this summer and the results were instantaneous: his shoulders immediately started exploding. Together, we pushed the pace, embarking on the fight to better ourselves, and, as the adage goes, to make ourselves all that we could be. The workouts became more and more intense as we tried to be the first to finish. Others in the gym began to take notice.

As time went on, we'd run across more and more people performing the WOD on their own. In conversations with them, the recurring theme was how to do the workouts faster, better, easier. The answer, of course, was to build motivation by working out together, helping one another, competing. Knowing that there had to be lots of other CrossFitters out there who would also enjoy hooking up with partners, we started a Facebook CrossFit group. In mid-September, we had 10 to 12 CrossFitters. By early November, after we'd initiated a regular workout time and invited anybody interested to join, we'd grown to 40 UNC students, including 10 girls.

People that you never thought would try CrossFit started doing it. The members were as different as the world we live in. As the numbers swelled, we split up the workouts. I would go in the morning and David would run the workouts at night. As the community started to grow, people began showing up in groups of three, five and sometimes more. The community started to feel like a real community as the workouts became more intense.

Grumbling from the Establishment

It was a great feeling to see such a rapid spread of the CrossFit ideology throughout the gym and the campus itself. But that feeling was tempered by ill will among the old guard. With CrossFitters growing more common in the gym, we assumed that any tension with management and regular gym-goers would disappear as they became more familiar with us and our method. But that isn't what happened. In fact, the tension ratcheted up. Despite our numbers, CrossFit was still looked upon as an underground movement, and was given no acceptance from the masses at UNC. The gym rats would get mad at us—no fistfights, but they'd stare us down, question our methods. The gym supervisors considered thrusters,

hang cleans, and all explosive lifts to be dangerous. We never had a day free of harassment from the staff, who demanded that we tone down or cut out certain lifts.

I often liken our ongoing battle for legitimacy to a 12-round slugfest between an up-and-coming fighter (us) and the seemingly unbeatable world champion (the gym). A big blow from the school came when they denied us any funding for the purchase of rings and kettlebells. They even prohibited us from using the sports teams' gym, which houses all the top equipment. The reason: CrossFit is not school-sponsored sport; it does not put money in the hands of the administration. The university does provide us with some decades-old metal rings, but they only scar our calluses and leave us bloodied when we bash our heads into the support bar.

Ultimately, our problem in getting an unfettered place to do CrossFit boiled down to two issues: We weren't an "official" campus club, and we were not officially associated with CrossFit. No official recognition as a club on campus = no funding. That made it easy for the university to turn its back on us. But as the CrossFit buzz grew, we could feel the tide turning.

The local newspaper interviewed Blumberg and wrote a column about the CrossFit movement at UNC. Finally, one sympathetic gym manager drew up a compromise: we could do overheads in the gym, but only within the squat rack. That cramped taller people like David. Yet the school would not budge further. If we wanted to be legitimate, we had to go through legitimate channels.

Join The Club

We resented having to do our workouts without muscle-ups and kettlebell swings. We hated living in the shadows of the typical lifters. We needed to break out and force the recognition of CrossFit as a legitimate and elite training program. The feeling was universal in the growing community. We realized if we were to continue improving ourselves through CrossFit, we'd better act.

Blumberg, Valdez and I tackled the task full-frontal by deciding to form an on-campus, school-certified, non-profit club. We would use this club to correct misperceptions, cultivate support, strengthen and then broaden the CrossFit community. On top of that, certification would make funding available.

Blumberg then emailed CrossFit to inquire about the possibility of starting a non-profit affiliate here at UNC. The okay came quickly—as long as we had a certified trainer to run it. No problem—even though I'm only a freshman, I volunteered to get the certification. There was one small hurdle, however: A fee of $1000. One thousand might as well have been one million for us college students.

But in keeping with the CrossFit mentality, we didn't quit. I talked to Andy Hendel, the creator of CrossFit Charlotte, the venue for a certification on December 21. He found a way for me to attend it cost-free.

As I write this, certification is just a month away, yet it seems like an eternity. I have a lot riding on it. I have always been an optimist, looking for ways to help people, and the cert obviously will further that. It might also help pave the way for my future profession: teaching, which hopefully will include coaching football, a lifelong love of mine. A CrossFit certification might open the door to an assistant coach position or strength-and-conditioning job.

And finally, the expertise I gain from the Cert will help me in my personal life, aiding my confidence, focus, and work ethic, the qualities everyone needs for success in life.

If all goes as planned, Crossfit UNC will be fully operational by next fall. After my cert, there's a lot of paperwork to fill out, and plenty more bureaucratic hoops to jump through. Until then, we as a group will continue to better ourselves and the CrossFit community by putting our major goals into practice: the spreading of the CrossFit philosophy of self betterment and the acceptance of CrossFit as an elite workout program.

And when next fall rolls around, lack of equipment will no longer stand on our way. By then, as an official UNC club, we can price out what we need and submit a funding request. After all, the school's been known to give clubs five to ten thousand dollars. But to tell you the truth, we'd be happy with $500 for kettlebells. As CrossFitters taking our rightful place in the UNC gym, we'll be ready for the stares—of amazement and admiration.

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About The Author

Juan Hernandez, a Freshman at the University of North Carolina at Chapel Hill, has been strength-training since 8th grade and CrossFitting since August.