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Scoring Martial-Arts Workouts for Intensity

Pitmaster John Hackleman offers ideas on how athletes and trainers can measure the quality and quantity of martial-arts fitness training.

John Hackleman with Greg Amundson and Shain Howard



Courtesy of John Hackleman

One of the core tenets of CrossFit is intensity as measured by average power. This is a pretty easy concept to evaluate in most of the CrossFit movements. You have a fixed load moving a known distance. Multiply the number of reps and divide by time. Doing more work in less time is the fast lane to fitness.

However, in the world of mixed martial arts (MMA), coaches face some daunting tasks when it comes to measuring athletes' workouts.

Courtesy of John Hackleman



***Are these athletes exerting themselves?
An experienced coach can usually determine how hard
an athlete is working, which helps take some of the
guesswork out of measuring MMA workouts.***

*Coach Glassman and I
collaborated on a program called
"CrossPit." The task at hand
was to find a way to qualify and
quantify workouts that involved
physical modalities such as
grappling, free sparring, kata
and heavy-bag work.*

My purpose in writing this article is to introduce CrossFit athletes and coaches to some of the adaptations I've used with success at my CrossFit affiliate: [The Pit](#) martial arts and fitness.

Take a simple Pit workout: 100 head kicks and 1,000 punches for time. That workout seems easy to score, right? The faster you hit the bag with 100 head kicks and 1,000 punches, the better your score. But, if Athlete A performs the task in five minutes and uses only 10 percent of his speed and power while Athlete B performs the task in 10 minutes and uses 90 percent of his speed and power, is Athlete A still getting better results?

Coach Greg Glassman has addressed this very issue in the case of quantifying and qualifying workouts involving sledgehammer drills. Performing 10 sledgehammer strikes on a large tire fast but with little speed and power is much different than 10 sledgehammer blows with maximum power output.

The Value of a Punch

First, when I refer to a "martial artist," I'm using a broad and inclusive term that includes athletes from the sport of mixed martial arts, made famous on such events as the Ultimate Fighting Championship. However, I also include athletes who train in boxing, karate, judo, wrestling, and even reality-based programs such as Krav Maga and Tony Blauer's Spear System.

When I was first introduced to CrossFit at a certification in 2003, I was amazed by the genius of Greg Glassman. He had essentially turned fitness into a sport. By timing how long it took athletes to complete various physical tasks, Coach Glassman was able to quantify and qualify an athlete's score, which was usually associated with the speed at which the tasks were completed. My goal after completing the certification was to find a method by which I could quantify and qualify traditional martial-arts workouts. In this pursuit, Coach Glassman and I collaborated on a program called "CrossPit." The task at hand was to find a way to qualify and quantify workouts that involved physical modalities such as grappling, free sparring, Kata and heavy-bag work.

As Bruce Lee famously stated, "Boards don't hit back," and when you're training it's important to remember that people, unlike inanimate objects, do hit back. We have to take this into consideration when considering kata and bag work, which involve only one athlete, and grappling and sparring, which involve multiple athletes.

Courtesy of John Hackleman



**John Hackleman uses simple formulas to quantify MMA workouts.
The key component is to use a trained eye to measure an athlete's level of exertion during a drill.**

A punching-bag workout is hard enough to measure. Now imagine how difficult it is to measure and quantify a workout with the added dynamics of two athletes competing with each other in a training session involving the modalities of grappling and bag work. Unlike a 50-lb. plate of iron that never changes or a 400-meter track that will never be 430 meters, martial-arts athletes are always changing: better, faster and stronger some days, and worse, slower and weaker other days. The only consistent factor in martial-arts partner training is that your partner will never be the same two days in a row. This makes it very challenging for a coach to measure the work output of two athletes.

The Formula

In order to assist affiliate coaches in quantifying and qualifying martial-arts type workouts, I would like to offer three formulas that have worked with great success at The Pit:

1. Perceived Level of Exertion (PLE)—The level of exertion an athlete displays during a martial-arts workout, as perceived by the coach or athlete.
2. Assigned Level of Exertion (ALE)—The assigned level of exertion given by a coach to an athlete to be used during a martial-arts workout.
3. Variable Imposed Resistance (VIR)—The assigned amount of resistance given by a coach to an athlete to be used during martial-arts partner training.

Perception in the Fitness World

In CrossFit workouts, coaches are very rigid in their scoring. Ensuring that full range of motion is used and required repetitions are met helps maintain a standard of fairness during CrossFit competitions, but it also contributes to the safety and efficacy of the movements in everyday WODs. Full range of motion is important not only to determine the winner of the CrossFit Games, but for every athlete seeking true functional capacity.

But what about workouts that involve a coach's perception of the amount of work an athlete is doing?

In the case of martial-arts training, it is simply not practical to think that everything can be precisely preformed, counted, measured and documented to be scored. At the same time, the need for training with maximal intensity is as real for martial artists as it is for any CrossFitter. In this way, perception can be a martial artist's ally.

Perception already has an established place in sport. For example, in Olympic boxing, judges score fights and—barring knockouts—decide a winner based on their perception of which fighter won. The same is true for figure skating and gymnastics, where scores are largely based on the perception of the judges. Awards, degrees, medals and fortunes are won and lost on perception, and if the evaluation is done with honesty, an educated eye and some consistent standards of reference, perception can be a very accurate measuring tool. In some cases, it's the only one.

Shadow Boxing or Kata

In the above examples, perception was used to determine the outcome of a competition. In our case, perception can be applied to measure the intensity of martial-arts workouts. This will never be as accurate as $\text{force} \times \text{distance} / \text{time}$ with fixed loads and distances, but we have used it successfully at The Pit.

We'll start with the easiest martial-arts movements or drills to score: kata and shadow boxing. Both are just drills where you practice your moves without hitting anything but the air. While these skill drills are known for developing focus, coordination, accuracy, agility and balance, they can also improve stamina, cardiovascular endurance, speed and power if they're performed with more intensity.

The scoring or measuring of a kata or shadow-boxing session is based solely on time and PLE or ALE. Here is the formula: length of workout multiplied by PLE or ALE. For example, if I did a 15-minute shadow boxing or kata session and my coach thought I put 65 percent of my intensity into the workout, my score would be calculated as follows: $15 \times .65 = 9.75$.

Heavy-Bag Work

For decades, bag work has been used in all combat training to help build strength and power. However, with a little bit of creativity, heavy-bag training can improve all 10 of CrossFit's recognized fitness domains. Throw in some calisthenics, weight work or even grappling with a bag, and the possibilities are endless.

The key point, as with all CrossFit workouts, is to maximize intensity. Here are a few hints: visualize an opponent and avoid just hitting a bag, snap or whip your strikes instead of pushing them, and always be on the move—in, out or laterally.

To measure bag workouts, start with a raw score. Punch workouts score .25 per punch, kick workouts score 1 per kick, and freestyle (punches and kicks) workouts score 20 per minute. Then, multiply the work time with ALE or PLE and the heavy-bag factor (HBKF for kicks and HBKP for punches).

Here's an example: Al did a head-kick workout and threw 18 kicks in a one-minute workout. His coach perceived his intensity to be 75 percent. Here is Al's score: $18 \text{ kicks} \times 1 \text{ (HBKF)} \times .75 \text{ (ALE)} = 13.5$.



Courtesy of John Hackleman

If John Hackleman's opponent is rated a "5" and they spar for 10 minutes at 60 percent intensity, John's score for the workout is calculated as follows: $10 \times .6 \times 5 \text{ VIR} = 30$.

The only consistent factor in martial-arts partner training is that your partner will never be the same two days in a row. This makes it very challenging for a coach to measure the work output of two athletes.

Al did a punching-bag workout, throwing 88 punches. He perceived his own intensity to be 80 percent. Here's the scoring: $88 \text{ punches} \times .25 \text{ (HBPF)} \times .80 \text{ (PLE)} = 16$.

Al's two-minute freestyle bag workout at his coach's ALE of 80 percent would be scored as follows: $2 \text{ minutes} \times 20 \times .80 \text{ (ALE)} = 32$.

There will always be some inaccuracies in measuring exertion, and there's little you can do with someone committed to faking it. Still, it does give us a way to measure and compare workouts based on approximate numerical values.

Grappling and Sparring

This category is by far the most difficult in which to measure one's fitness progress. There are so many variables and factors, which are exponentially more difficult to measure when you realize that an athlete's performance and progress are directly influenced by the other athlete. It would be like a weightlifter trying to measure and track progress when he never performs the same lift and never knows what weight he's lifting. How could he possibly measure his progress accurately?

Because your training partner has so much to do with the level of intensity, he needs to be factored into your score. To do that, we assign him a variable imposed resistance (VIR) number that considers his weight, strength and skill level compared to his opponent.

For instance, the bigger and better your training partner is, the higher his VIR number, so the harder you have to work. The VIR scale is based on a 1-10 system, with 10 being the highest level of partner-offered resistance and 1 being the lowest.

Measuring, documenting and tracking you and your students' martial-arts workouts are great tools for pushing your workouts to their limit.



Staff/CrossFit Journal

The Pitmaster beats home his point: larger, more experienced opponents receive a greater variable imposed resistance score.

For example, world-class 135-lb. MMA fighter Antonio Banuelos would be rated a 10 if paired with an average 135-lb. non-pro fighter, but if he was paired with former UFC champion Chuck Liddell (approximately 205 lb.), he would be rated a 3. As you can see, the VIR is relative to the partner.

The VIR is used as a multiplier to score an athlete's grappling or sparring session. For example, a 20-minute session at a coach-assigned ALE of 75 per cent with a partner whose VIR is 8 would be scored as 120 (20 x .75 ALE x 8 VIR).

"White Boarding" the Martial Artist's Workouts

In conclusion, we can see that measuring the fitness score or progress of a martial-arts or "combative" workout can be quite challenging for a number of reasons. Assigning scores and measuring workloads, work capacity, technique, intensity and progress make for a full-time job with so many complex techniques and variations in skill sets and drills. Still, putting in the effort will provide you with data and allow you to track progress and improvements.

The scoring for our martial-arts or CrossPit workouts is done on a points system similar to Fight Gone Bad, and, like CrossFit workouts, these scores can be posted on the white board. The idea is to measure the martial artist's status and progress in his fitness. Measuring, documenting and tracking you and your students' martial-arts workouts are great tools for pushing your workouts to their limit.

While this article was written for martial artists and their training, these approaches give CrossFit trainers and athletes a way to incorporate martial-arts-type workouts into their CrossFit training without abandoning measurable, observable and repeatable results.



About the Authors



John (The Pitmaster) Hackleman, RN and 10th degree black belt, is the founder of [The Pit](#) in Arroyo Grande, Calif. He has trained UFC superstars Chuck (The Iceman) Liddell, K-1 Champion Scott Lighty, and world-ranked WEC and UFC fighters Antonio Banuelos and Glover Teixeira. He is a Level 3 CrossFit trainer.



Greg Amundson has been recognized by his peers as being the original CrossFit firebreather. He was coached and mentored by CrossFit co-founders Greg and Lauren Glassman at the historic CrossFit Headquarters in Santa Cruz, Calif. Greg has served in law enforcement and military leadership roles for over 10 years.



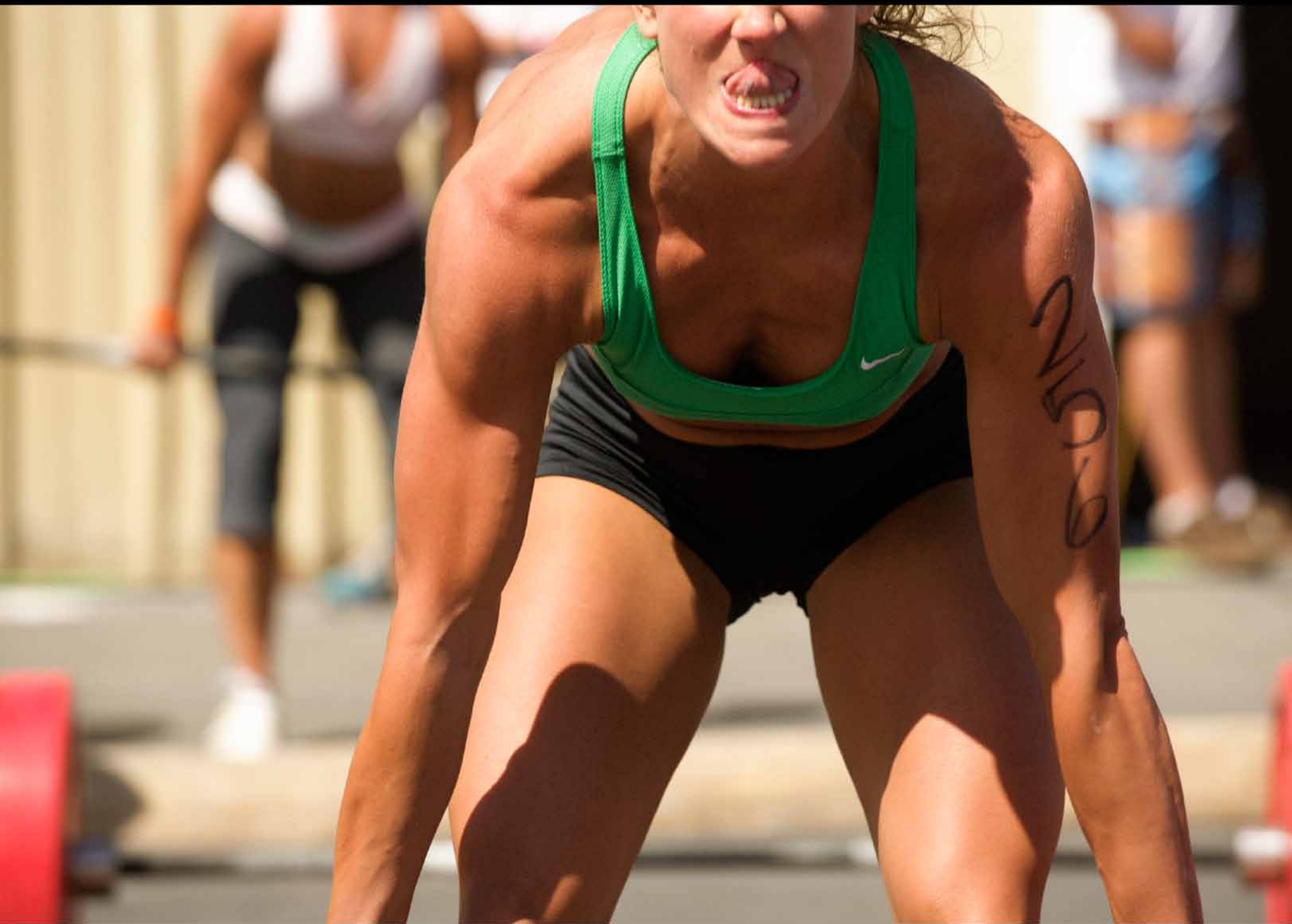
Shain Howard is the co-owner of [SinCity CrossFit](#) in Henderson, Nev. Born in California, Howard spent time in both Peru and Ecuador before moving back to the U.S. He graduated from UNLV with bachelor's degree in pre-professional biological sciences and is working toward becoming a medical doctor.

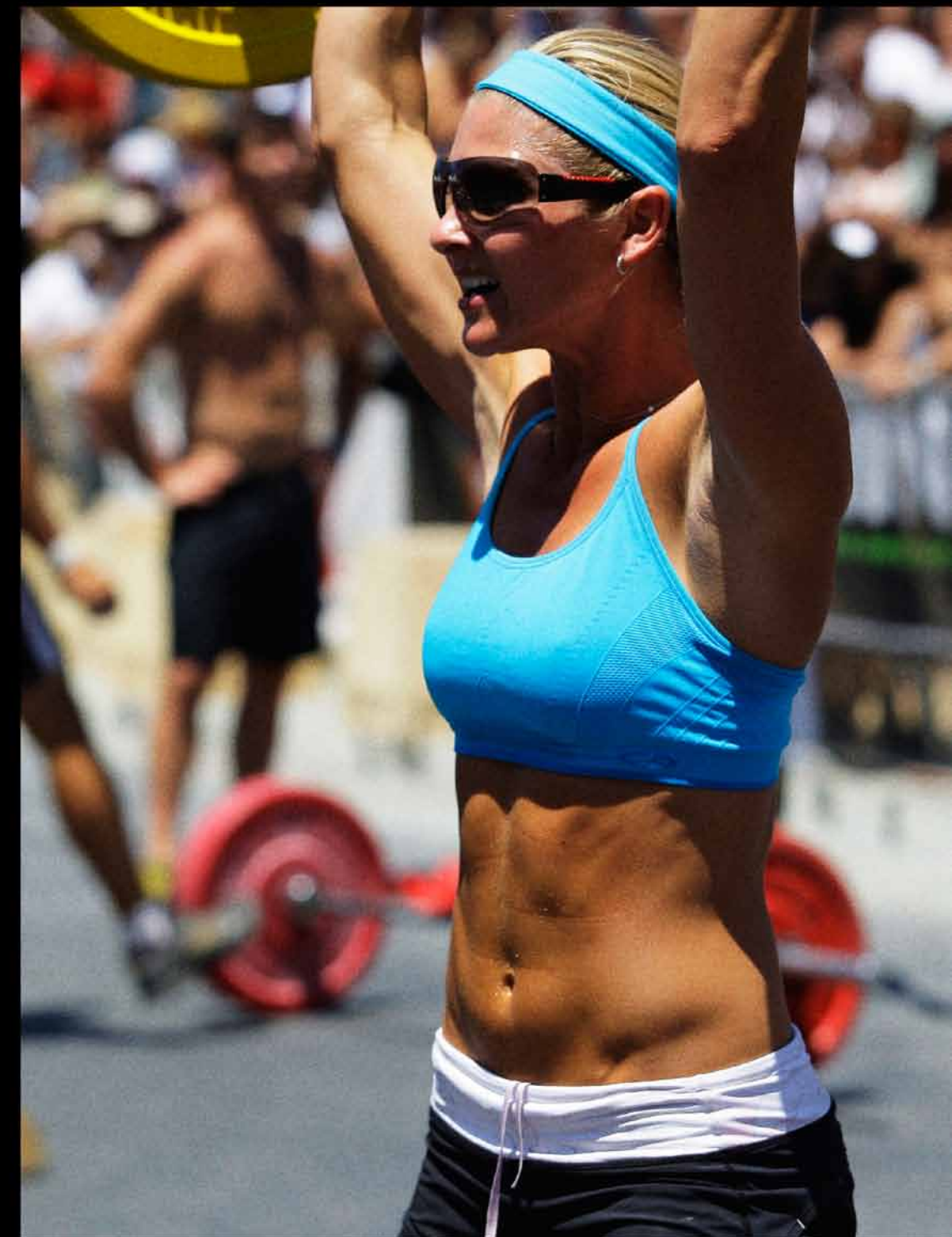
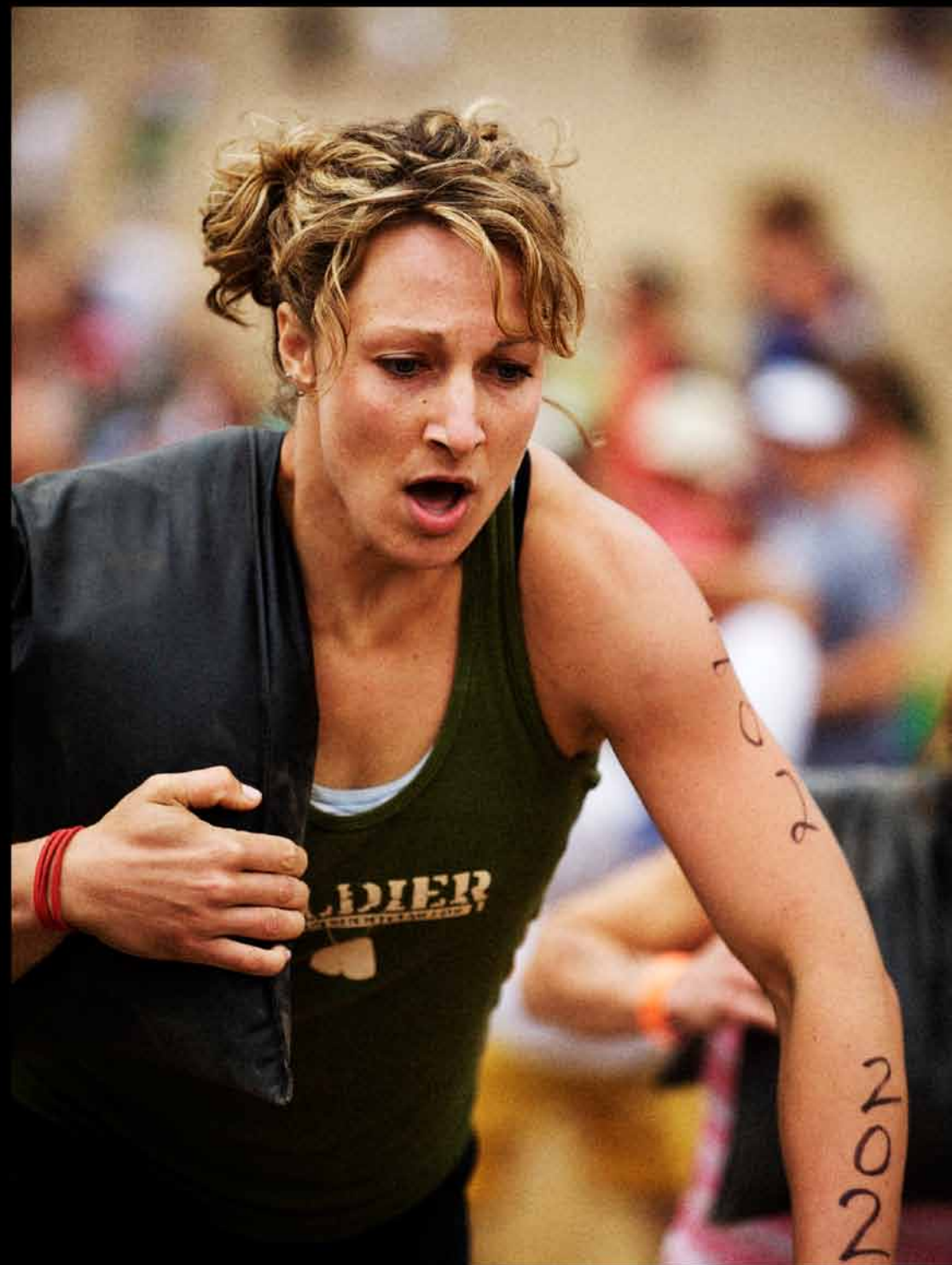


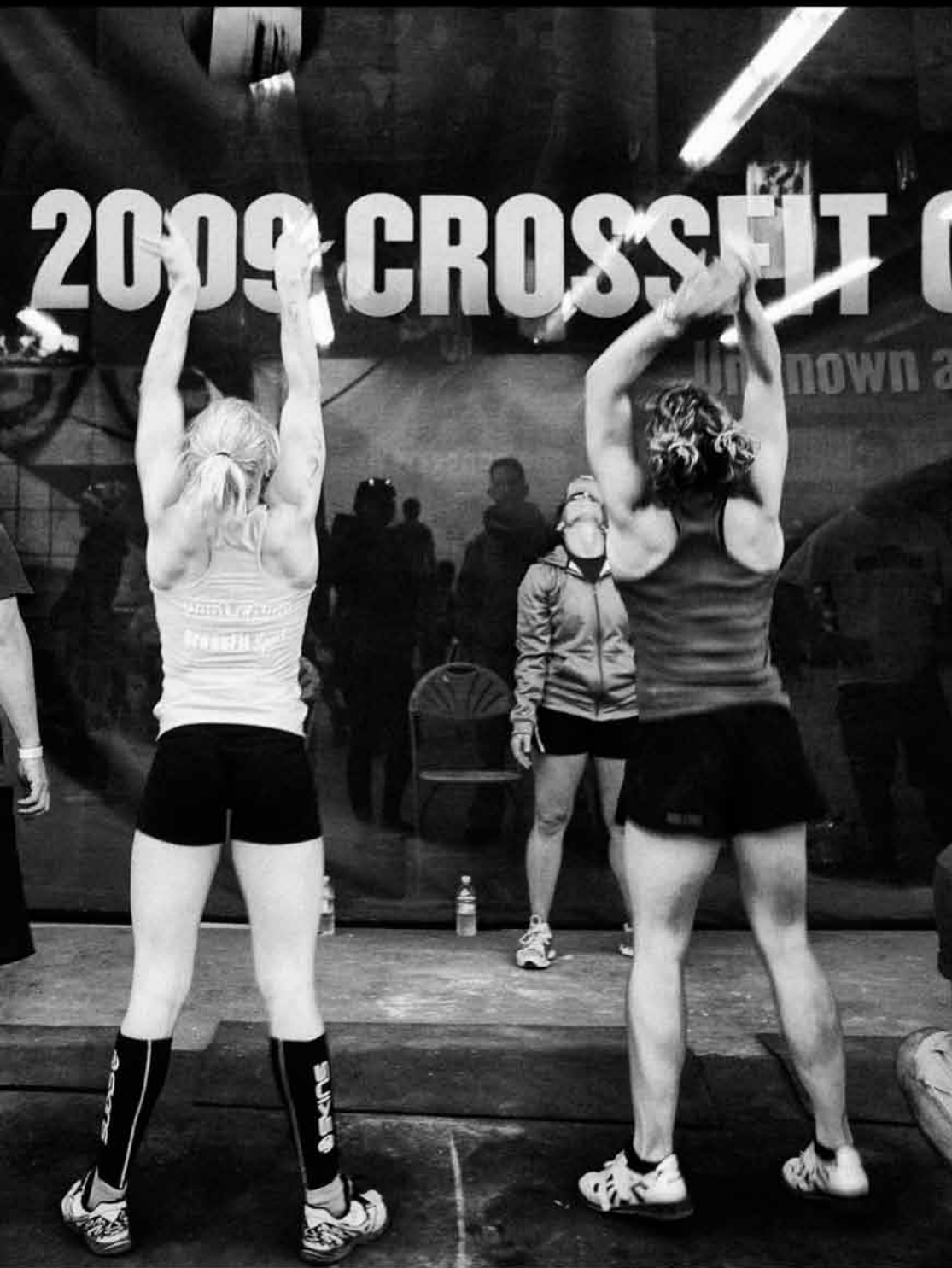
Beauty in Strength





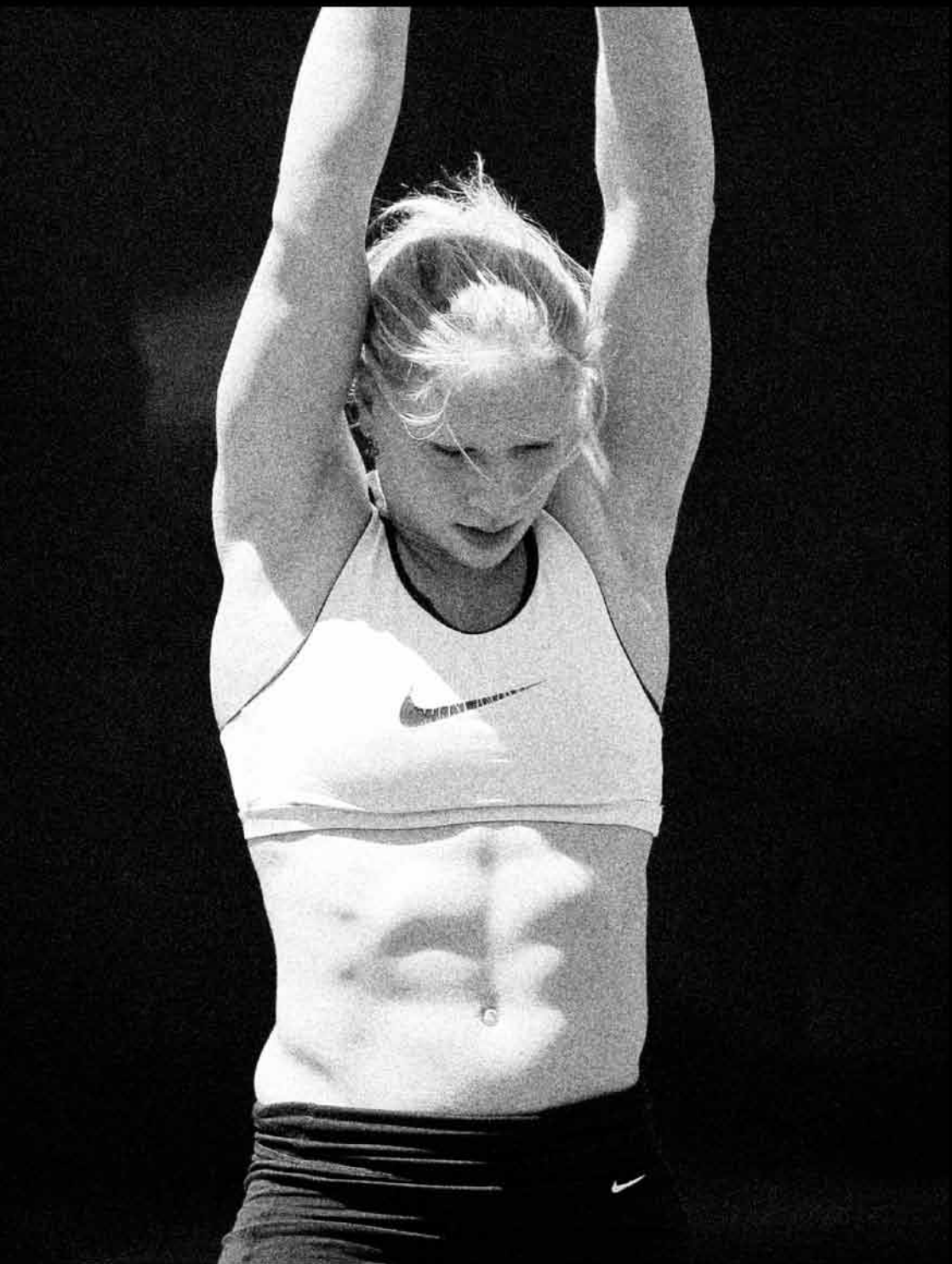


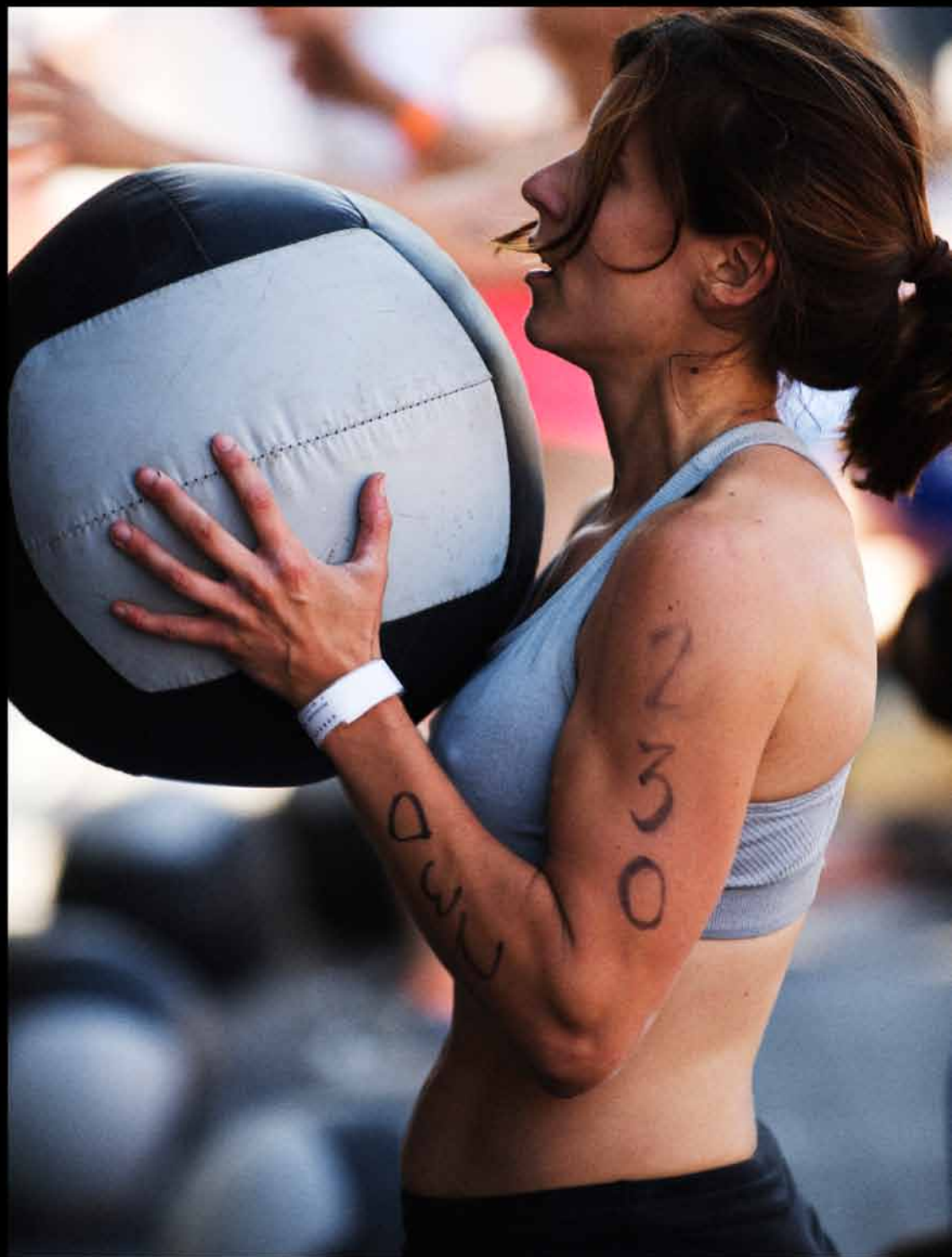
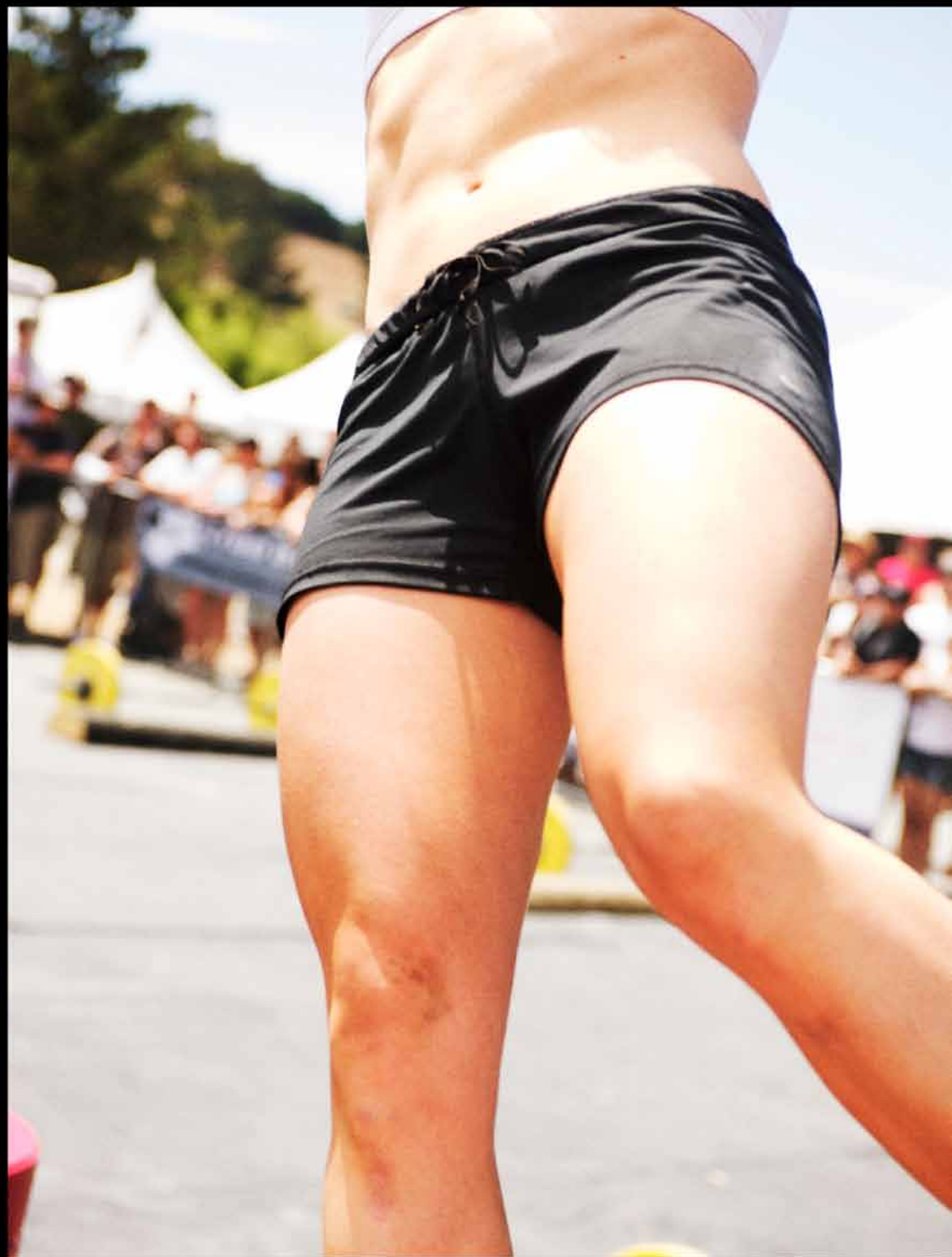


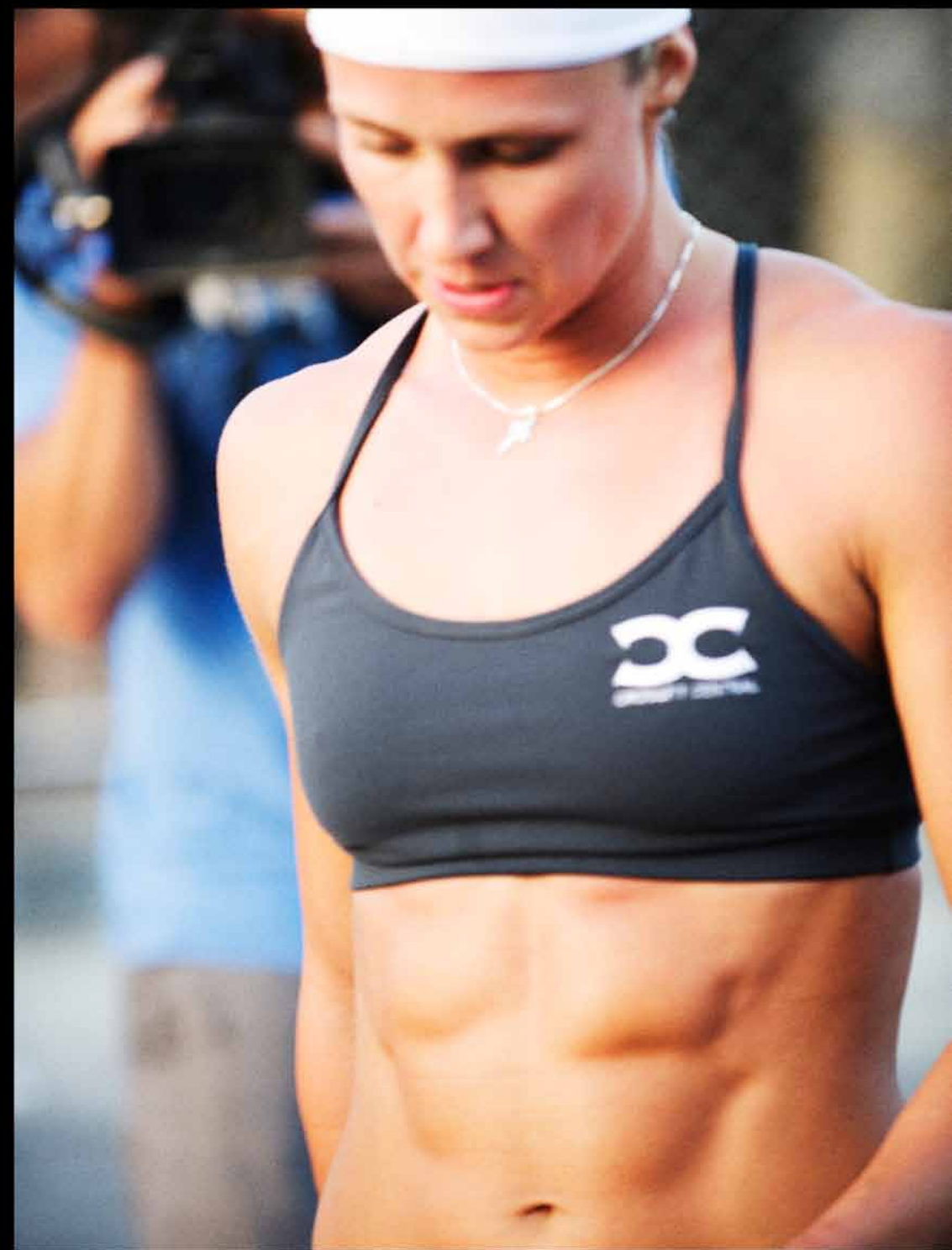
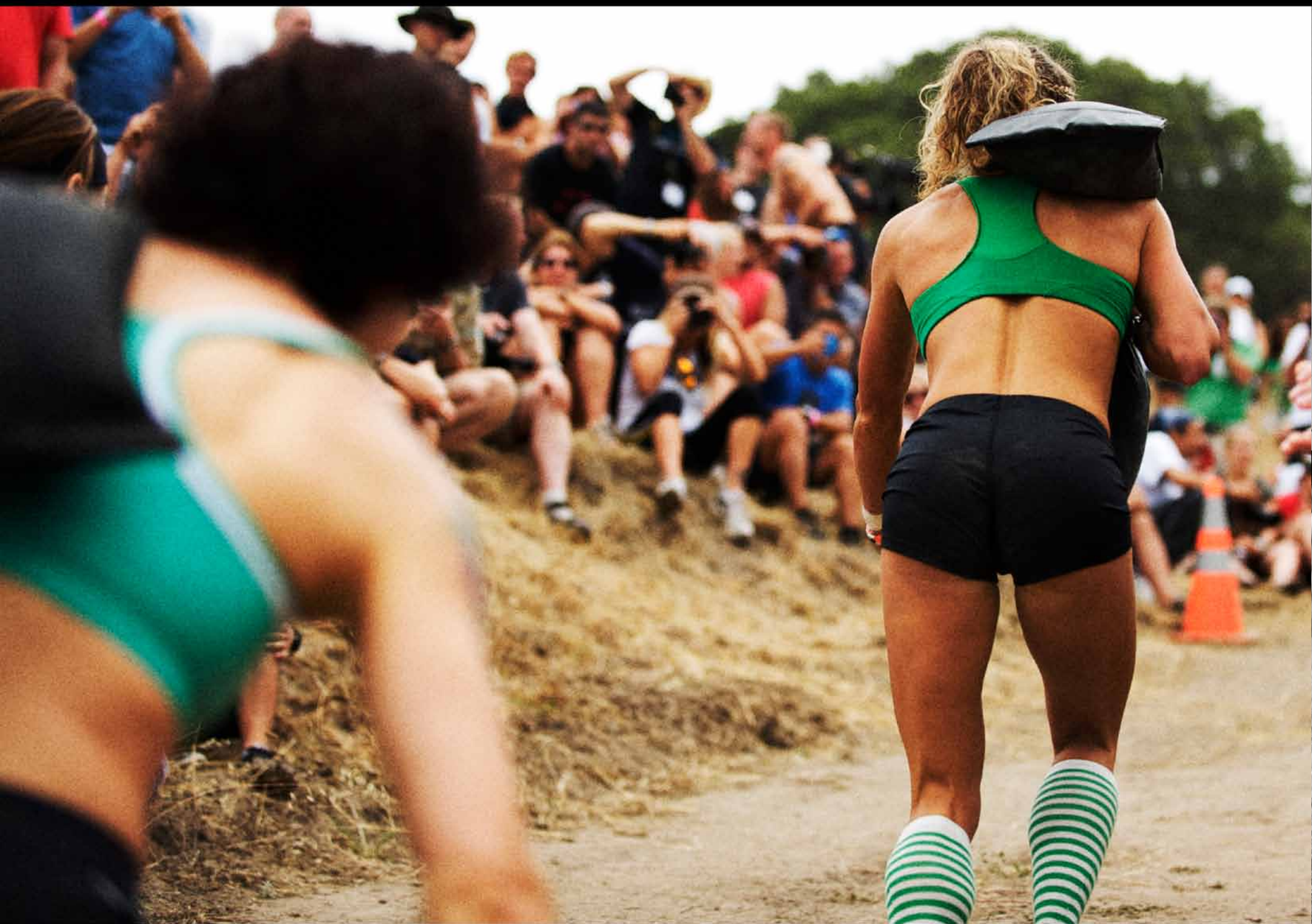










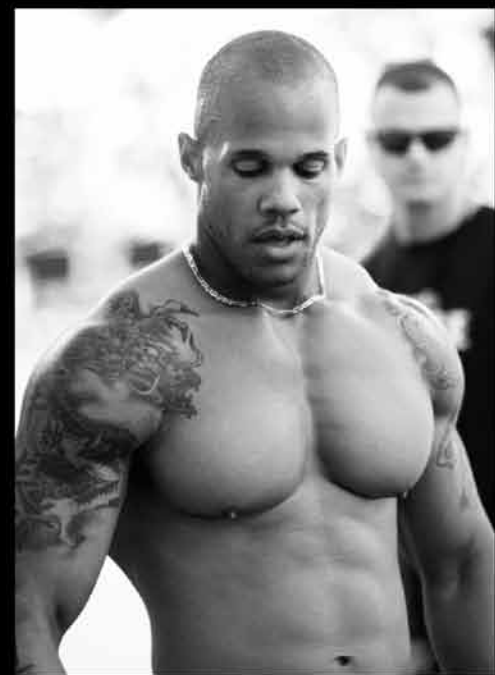


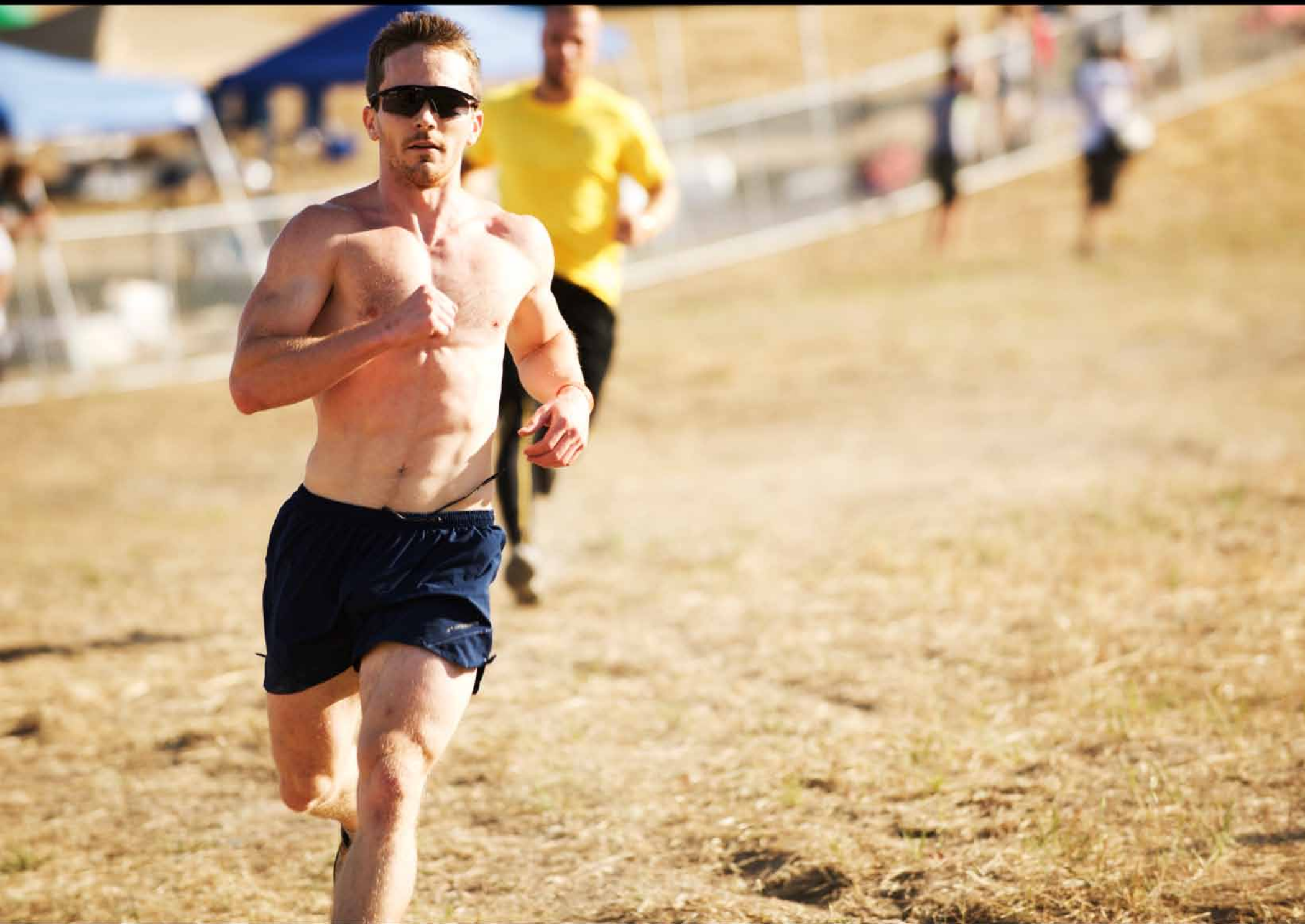


THE PAIN PASSES, BUT THE *beauty* REMAINS.
—Renoir



Iron Will, Iron Bodies











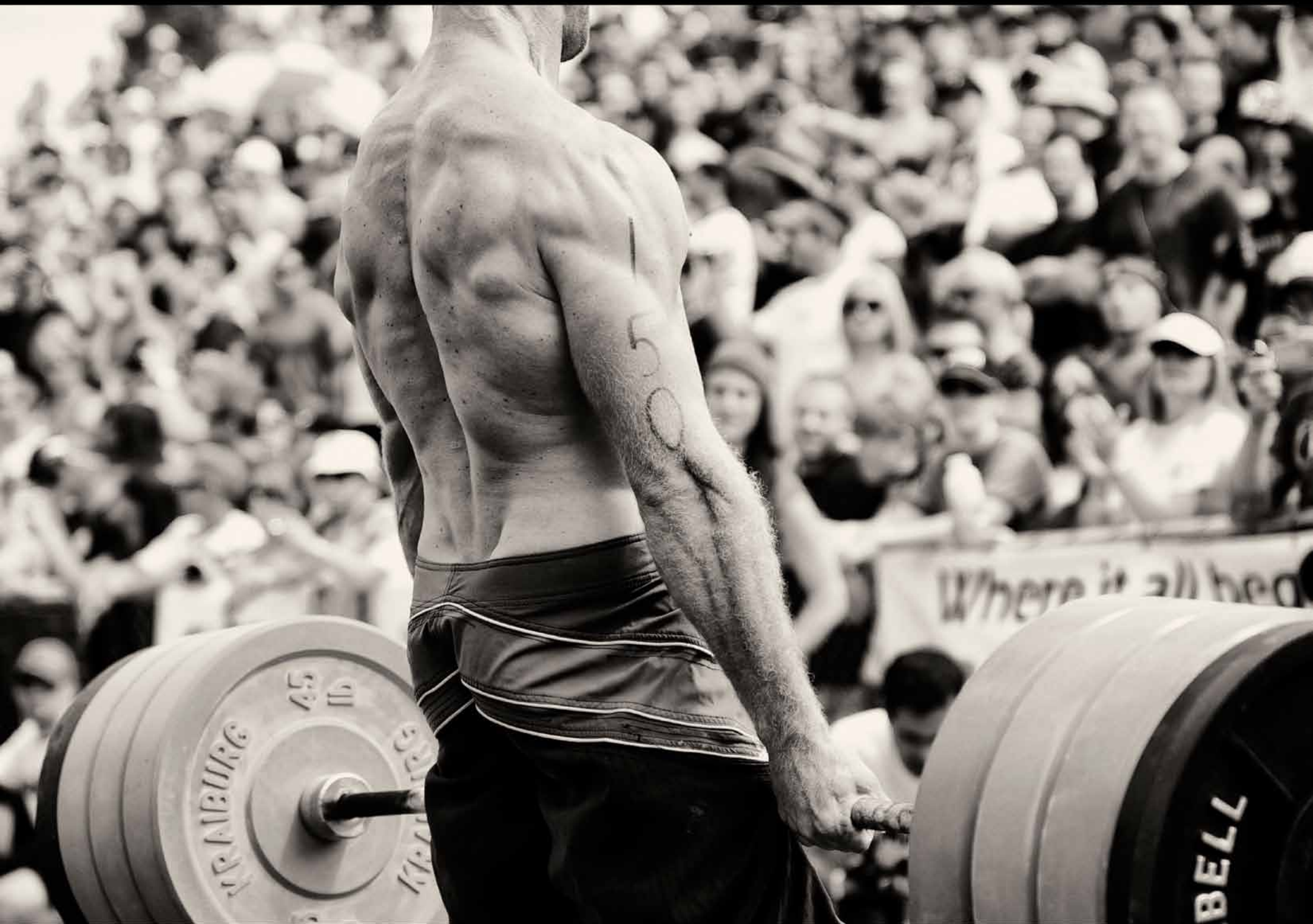












PEOPLE DO NOT LACK *strength*, THEY LACK *will*.

—Hugo

The Asshole Barrier

Jerks are rare in the CrossFit world—but why, and how do you deal with the occasional creep?
Affiliate owners and academics offer answers and strategies.

Craig Silverman



After finishing the WOD, the guy looked over at one of his fellow members at [CrossFit Virginia Beach](#) and said, "Is that all you're going to lift?"

For owner Thomi Gill, that was the last straw.

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Read the Fine Print, Asshole

Less than a month earlier, this particular member had shown up at CrossFit VB. Soon, Gill noticed that other athletes seemed to tense up when he walked in the door. And when she tried to coach him, he wouldn't listen.

"He would always rebut my cueing with excuses or reasons why he thought the lift went wrong, instead of just listening," she says.

After he made that snide remark about another athlete's performance, Gill decided it was time for him to go.

"I told him I didn't believe he saw any value in being trained," she says. "You're here to be trained, and it was very interruptive to other clients because they'd wonder what was going on. I just told him I didn't think it was the place for him. He didn't really say much and never came back."

It wasn't the first time she'd spoken to him about his behavior. And if he didn't get the message, Gill was ready to play her trump card: the "asshole clause."

"The saying is that one bad apple ruins a bunch, and we didn't want one asshole in a class of 25 people to make the other 24 dread going there every day."

—Pat Sherwood

The waiver at CrossFit VB states, "CrossFit Virginia Beach strives to provide a positive and encouraging environment for our clients. Anyone that is disruptive or negatively influences this environment is subject to having their membership revoked. This is at the sole discretion of CrossFit Virginia Beach Management."

The word "asshole" isn't used, but Gill says she frequently tells clients that "it's basically an asshole clause." Former CrossFit VB co-owner Pat Sherwood, now a trainer with CrossFit HQ, says they drafted the clause before opening their box.



—"I'm an asshole." — Denis Leary, 1993.



An "asshole clause" in your waiver can be used to keep confrontational, arrogant people out of your box. You may never use it, but it's nice to have just in case.

"I've always been of the opinion that people can do 400-meter runs and deadlifts anywhere," he says. "For them to want to come into a gym and do it in that sort of environment, it would have to be one that they enjoy going to every day. They'd have to enjoy the people there and feel like they're truly cared for and respected. The saying is that one bad apple ruins a bunch, and we didn't want one asshole in a class of 25 people to make the other 24 dread going there every day."

Gill says most new members smile when she explains the clause. Nobody wants to be around assholes—especially not CrossFitters.

CrossFit Inc. doesn't have an official no-assholes policy. What's taken shape is more powerful than any written directive: a culture that, as Coach Greg Glassman put it in the *CrossFit Journal* video [Primal Fitness](#) (Aug. 25, 2009), naturally "co-select(s) for a bunch of admirable character traits."

In the video, Coach Glassman also told CrossFit media director Tony Budding that "assholes don't like to suffer and sacrifice today for some gain tomorrow." As a result, they don't last long in CrossFit, whether they're doing the workouts on their own and posting to the main site or training at a local box. Budding himself likes to say that CrossFit has an "asshole barrier."

Bad Behavior Is Contagious

If an asshole barrier indeed exists, it bodes well for the present and future of CrossFit. Research shows that people with asshole-like traits do more than simply annoy co-workers, ruin a workout or hijack an online discussion thread. Assholes get in the way of excellence.

Bob Sutton, a professor of management science and engineering at Stanford University, is the author of *The No Asshole Rule*, a best-selling management book. His definition of an asshole is "somebody who leaves people feeling demeaned and de-energized."

That perfectly describes the impact of the particular asshole at CrossFit VB. Lisbeth Darsh, CrossFit's affiliate community manager and the owner of [CrossFit Watertown](#), says the CrossFit definition of an asshole should also include cheats who lie about their reps.

According to Darsh, an asshole is "a cheater and someone who doesn't want to be part of the group, who wants to do their own thing when the entire class is all moving in one direction. Like when everyone is doing the group warm-up and they think they're special enough to be off bench-pressing by themselves."

Adrian Bozman, an HQ trainer and coach at [San Francisco CrossFit](#), says that in his experience assholes are unwilling to be coached or learn anything new.

"Being willfully ignorant is probably the biggest (asshole) criteria on my list," he says. "Sometimes you come across people—and for me this happens more at an affiliate—where they walk in and aren't sure what they're doing there, and they are defensive about what they've done in past. If you try to discuss topics with them or try to inform them, they aren't having any of it. They're unwilling to listen to a different point of view."

Clearly, an asshole can take many forms. But one truth is that this particular breed of human has long been found inside gyms. Not surprisingly, Sutton's book, which is filled with examples of companies that won't tolerate asshole behavior, includes a quote from Gold's Gym owner Joe Gold.

*One of the biggest problems with
assholes is they're contagious.
They infect those around them,
bringing down the level of
performance and exacting
a physical and intellectual
toll on others.*

"To keep it simple you run your gym like you run your house," Gold said. "Keep it clean and in good running order. No jerks allowed. Members pay on time, and if they give you any crap, throw them out. There's peace where there's order."

One of the biggest problems with assholes is they're contagious, according to Sutton. They infect those around them, bringing down the level of performance and exacting a physical and intellectual toll on others.

"Essentially, research shows that when people are around rude people or negative emotion, it leads them to get physically sick, to have trouble solving problems," Sutton says. "Even witnessing rudeness can make people all tense and constrict their intellectual abilities."



a4gpa/Creative Commons

CrossFit seems to have an "asshole barrier," but the occasional jackass can still wander into the gym. If you've created the right culture, the problem should take care of itself very quickly.

A study published this summer came to a similar conclusion. According to a report in the *South Florida Business Journal*, "Simply observing discourteous behavior erodes fellow employees' ability to think creatively, solve problems, be good team players and even goes so far as to make them harbor deep, dark and destructive thoughts."

"The negative consequences of rudeness on the job are not limited to the person who happens to be the victim," said researcher Amir Erez, a University of Florida management professor. "If five other people are watching, the effects are going to spill over into the rest of the organization."

Inside a box, an asshole can cause fellow athletes to tense up and lose focus or otherwise negatively impact their performance and attitude. Affiliates that tolerate assholes can lose members and develop an atmosphere that prevents people from reaching their potential.

Sutton emphasizes that the nature of the activity and the close quarters within a box make it essential that affiliates maintain an asshole-free environment.

Either way, the growth being experienced by CrossFit means it's a challenge to maintain and reinforce the existing culture and attract and retain the right kind of people.

"An asshole can poison the environment, and the fact that people will not have any place to escape is why it's especially bad," Sutton says. "It is a place where psychological safety is especially important."

He says one key to maintaining an asshole-free culture is to make sure top performers and managers don't treat less-experienced athletes like second-class citizens.

"A good test of a human being is how they treat people with less status or social standing than they (have)," Sutton says. "It sounds like (Gill of CrossFit VB) was applying that notion in telling that guy to go."

An Future Free of A-holes?

As CrossFit continues to grow around the world, it's increasingly important that CrossFitters—and especially the leaders of the community—are willing to call someone out on being an asshole and explain why such behavior isn't acceptable.

Sherwood says one of the things that impressed him about CrossFit is the attitude, or lack thereof, of top athletes and people from HQ.

"The more firebreathers I was around, the humbler they were," he says. "That lack of ego and sense of family is one of my favorite things about CrossFit."

His comment highlights another unique and perhaps contradictory aspect of CrossFit culture. It's competitive and often aggressive, yet it's also meant to be open and welcoming. Many affiliates look like torture dungeons (except they substitute the rack position for an actual medieval rack). As a result, some people walk in, look around and get their asshole on.

"It's not a normal-looking gym compared to what most people are used to," Sherwood says. "There are no cushy-looking machines. There may be some blood on the floor and death metal playing on the stereo. It's more like walking into prison than a gym, so some people might have a tendency to puff out their chest a bit more."

The competitive nature of CrossFit also extends to how CrossFitters see and present themselves to other athletes, and to the public at large. Some people might wonder if it isn't just a little bit asshole-ish to wear a T-shirt declaring, "Your workout is our warm-up" or "Your workout sucks." CrossFitters take pride in these slogans because they believe them to be true—not to mention funny—but an outsider could be turned off or get the wrong impression. To an outsider, "asshole" might seem to be a good word to describe the person wearing the T-shirt.

In other words, maybe CrossFit has an "asshole barrier" in the sense that it attracts the right kind of asshole—the kind of person who's willing to work hard and be a part of the community, but who can sometimes act a little bit smug and superior when away from the tribe. Either way, the growth being experienced by CrossFit means it's a challenge to maintain and reinforce the existing CrossFit culture and attract and retain the right kind of people.

"I will say that as CrossFit gets larger and more widespread, it would be foolish to say to the community that we don't have assholes among our ranks," says Bozman. "Is it a significant number? No, of course not."

The question then becomes one of asshole management. In her experience, Darsh says it's best to let the athletes police themselves. Trainers and affiliates should step in if that process falls short.

"I spent six years in the Air Force as an officer, and often best way for an issue to be taken care of was to let the troops take care of it," she says. "They hold each other accountable. If members can't handle it, then a trainer or owner will step in. A large part of being a trainer is knowing when to hug someone and when to kick them in the ass."

She also says that the community and affiliates have to be rigorous about weeding out assholes before they take root.

"You always have to be in command of where your affiliate or community is going and what the atmosphere is inside a box," she says. "If you have the type of place that tolerates and encourages an asshole mentality, then you will get more of those folks. You have to decide what's the vision of your box and if it includes those people or not."

CrossFit VB's approach is to express its values clearly in the waiver. Sherwood says doing so helps diffuse potential situations by sending a strong message to new members about how they're expected to act.

"When I explained it to them, I could see some people physically relax," he says.

Gill says members take pride in the no-asshole clause. In three years, she's only had to ask two people to leave.

"CrossFit is a competitive environment ... It's sometimes difficult for outside people to come in without having a chip on their shoulder," she says. "But the waiver says, 'Look, we're not assholes and we don't want assholes here, so leave your ego somewhere else, train hard and have fun.'"



Liam Maloney

About the Author

Craig Silverman is an author and journalist in Montreal, Canada. His first book, *Regret the Error: How Media Mistakes Pollute the Press and Imperil Free Speech*, won the Arthur Rowse Award for Press Criticism from the National Press Club in Washington. He is an associate editor for PBS MediaShift, a columnist for *Columbia Journalism Review*, and a regular contributor to the *Globe and Mail*. He trains at [CrossFit Plateau](#).

Rise Up!

Climbing stairs is a measurable, observable and repeatable activity.
Louis Hayes thinks more CrossFitters should add stair climbing to their daily WODs.

Louis Hayes



Staff/CrossFit Journal

This past year I stumbled upon a CrossFit message-board [thread](#) about exercises readers thought should be a part of CrossFit programming.

Some of the responses suggested sprinting, Turkish get-ups and throws. I happened to read the thread during my seasonal immersion in winter stair climbing, but my post suggesting “stair and hill climbing” went completely ignored by the other posters.

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A CrossFit Activity?

I wondered if I had too easily persuaded myself that climbing passes the fundamental three-pronged test of CrossFit: functionality, constant variation and high intensity. Why did no one else agree with me?

I believe climbing is a task that fits harmoniously within the CrossFit mandate. If one can't see climbing a few flights of stairs as functional, I ask, "What is more practical or lifelike?" The variety in stair climbing is infinite: speed, duration, skipping stairs, forward, backwards, carrying loads—these are but a few options. Lastly, for those who don't see climbing as a high-intensity activity, I'll race anyone to the top floor of a 20-story building and, when I catch my breath, argue about its intensity.

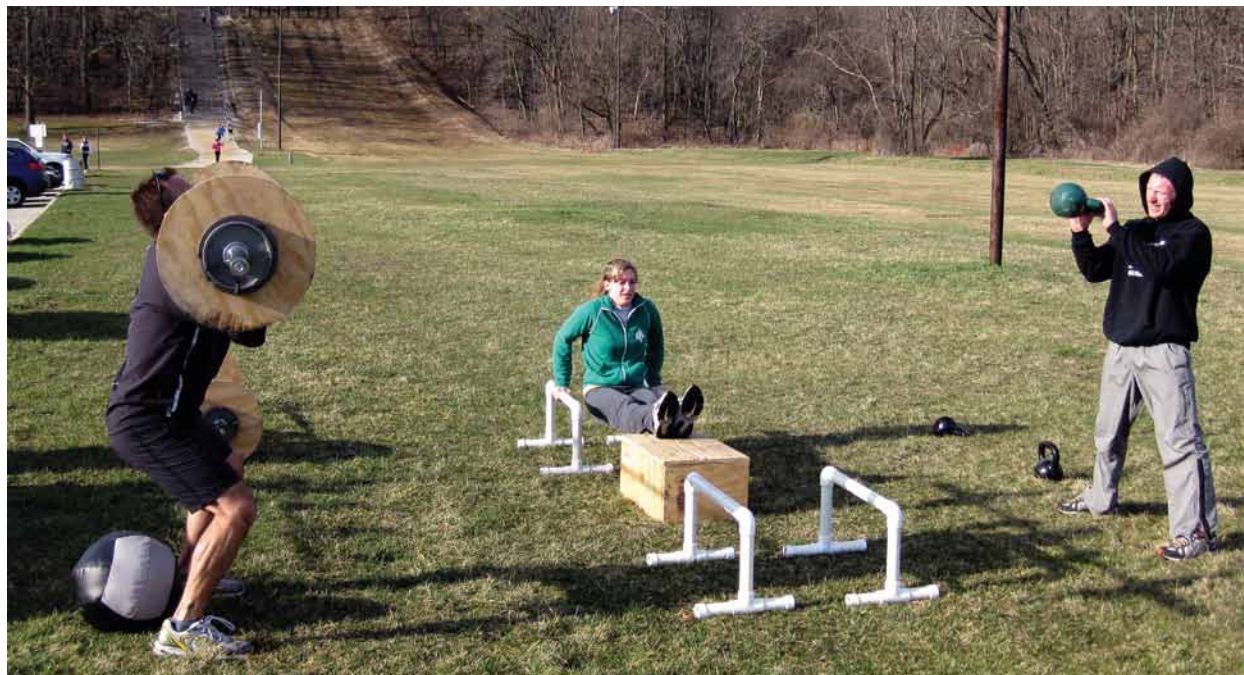
Stair climbing fits snugly into the CrossFit world on so many fronts, but it wasn't until this last winter's stair-preparation season that I really appreciated my new methodology's compatibility with CrossFit. With the help of the power-output formula, I took my stair-race training to new heights via measurement, analysis and repeatability.

CrossFit Training: A Step Up

I have been doing stair-climbing events for about six years. I live in Chicago, a city with no shortage of buildings in which to hold a charity event. Stair season is between November and March—the cold, icy months when bike paths along Lake Michigan or in local forest preserves are devoid of activity. The popular buildings for events range from 31 to 103 floors: Willis (formerly Sears) Tower, Hancock Center, Aon Center, Oakbrook Terrace, Presidential Towers. Top finishers in those same events finish in under four minutes for 31 floors to under 14 minutes for 103. What I find to be immediately noteworthy is how these durations are very similar to the benchmark times for typical CrossFit named WODs.

In the past, I used myriad flawed methods in preparing for these stair-climbing events. I used the inefficient step-mill machine in my work gym. During climbs in actual buildings, I wrongly focused more on duration and less on speed. I frequently confused jagged, unstructured rest periods for interval training. Of course, I even bought a heart-rate monitor to gauge my progress. Each of these approaches left much to be desired on race days.

Courtesy of Louis Hayes



The author believes stair climbs—such as the 76-foot ascent in the Swallow Cliff Forest Preserve in Chicagoland—are a perfect complement to more traditional CrossFit movements.

Several years ago, I discovered CrossFit. Like many CrossFitters, I was drawn to one of the main pillars of its method: high intensity. In the months before a stair event, I alternate between general physical preparation and sport-specific training (stairs). There are three main venues for my stair-specific training:

A four-story, 35-foot fire-department hose tower.

An 18-story, 180-foot high-rise apartment building.

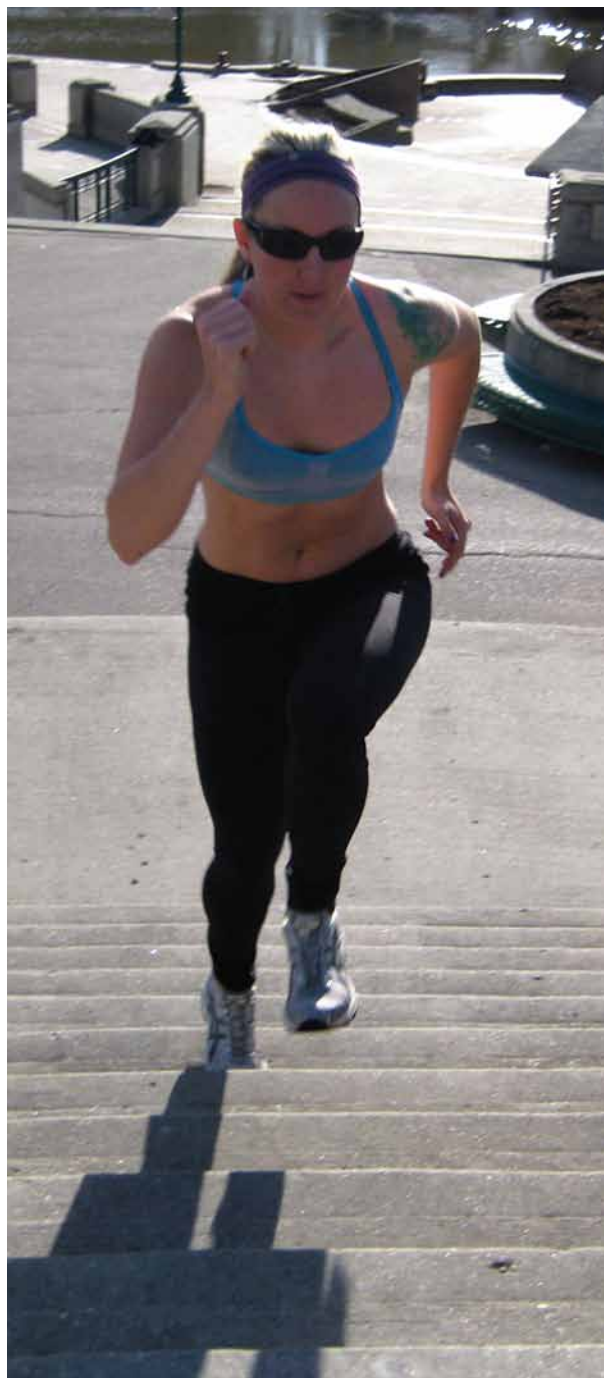
A 122-stair, 76-foot tall outdoor limestone staircase.

In times when I am not preparing for stair races, I still incorporate stair climbing into WODs. For example, the outdoor staircase is nestled within the Swallow Cliff Woods Forest Preserve of Cook County and once led to the top of toboggan chutes. It's been the site for quite a few group training sessions for my friends. The 76-foot rise pairs up nicely with pull-ups, push-ups and kettlebell movements. Our group meets twice per week at Swallow Cliff FP for workouts in the park.

I have near-unlimited access to each of these three venues, and each presents a different opportunity and challenge. During icy and windy times, the indoor facilities prove to be quite valuable.

Aside from adding gymnastics movements or kettlebells to complement the stair work, there are plenty of pure-climbing variations within stair training. A climber can use bodyweight only, wear a weighted vest, carry items—or any combination of those. Other variations include altering the speed of the climbs. Some climbers opt for the long and slow approach. Others sprint up, hitting only every other or every third step. Other techniques include side-stepping, hopping or climbing backwards. Whichever tactic is chosen, the power formula offers a measurable and repeatable way to quantify intensity.

Aside from adding gymnastics movements or kettlebells to complement the stair work, there are plenty of pure-climbing variations within stair training.



Staff/CrossFit Journal

There are no stairs at The Ranch, but climbing stairs might be one way to train for the hills of Aromas.

The Power Formula

The power formula is easily applied to stair training because of the known values that can be plugged in. Look at the formula:

power = force x displacement/time

The force is simply the weight of the climber in newtons (N), the displacement is the overall height of the climb in meters, and time is the duration of the workout or event in seconds. The result of the equation is power, measured in watts (W). Therefore, the formula for watts is:

watts = newtons x meters / seconds

Here are some simple conversions:

To get kilograms from pounds, divide by 2.2.

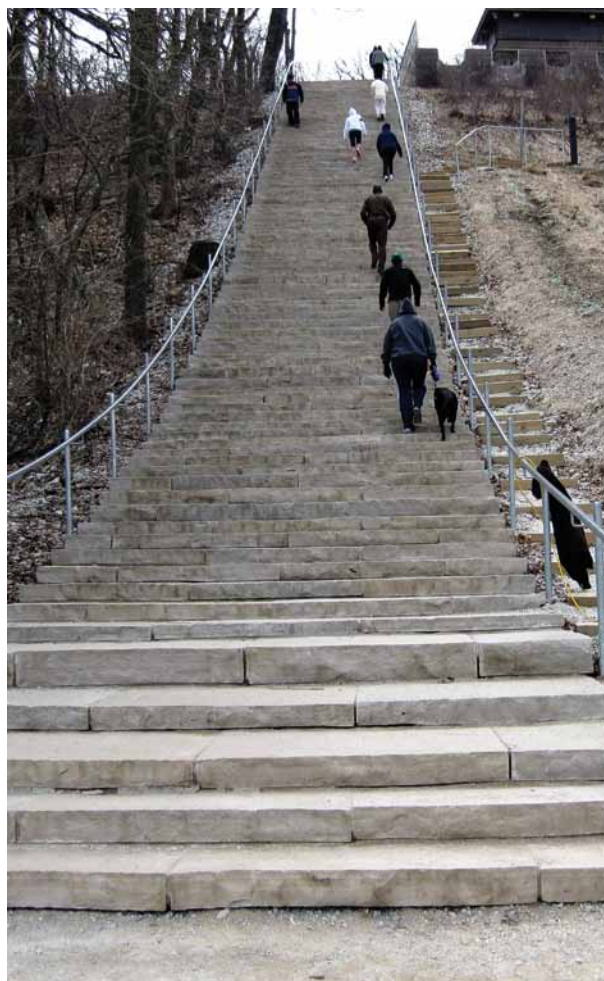
To get newtons from kilograms, multiply by 9.8 m/s².

To get meters from feet, divide by 3.281.

I've used 100-foot tapes, notepads and a measuring partner to determine height. One of our training partners sent over a survey crew to our outdoor venue and even had the sarcasm to ask if measurements within one-eighth of an inch were accurate enough. We've had a guy measure stair-riser height and count stairs. We've taken data from building engineers. There are plenty of creative ways to obtain the data needed to make this work.

What is important here is not the unit of measurements but rather the consistency of the units. Power can just as easily be measured in some unique way, such as "flights" instead of meters. Whatever units are used, be sure to be consistent with your comparisons from workout to workout. I have developed a simple Microsoft Excel worksheet that allows me to plug in numbers and track our progress.

One word of caution on the use of power. Power is best suited to comparisons of one athlete over time vs. one athlete over another. Life demands the accomplishment of tasks, not the increase of power. A larger athlete might be slower but could still achieve higher absolute power. But, given the variety of staircases and the challenge of standardizing results otherwise, power is a great tool for tracking an athlete's progress.



Courtesy of Louis Hayes

Stairs workouts are easily measurable and repeatable—two reasons the author likes to include climbs in his WODs.

*I ask not for WODs of four rounds
of 20 floors and 20 pull-ups.
What I do ask is for CrossFitters
to keep an open mind to include
movements that are not part of
main-site programming.*

The Power Formula Applied

Look at the following climb: a 235-lb. man climbs a 387-foot staircase. It takes him 4:52 from bottom to top. Using the above formula, his power output is 422 W.

The same man climbs a 35-foot staircase 15 times while wearing a 25-lb. vest. He completes it in 17:30, and the timer does not stop during descents. Power output: 178 W.

The same man climbs a 75-foot staircase in 20 seconds. The power output is 1196 W.

The same man climbs a 75-foot staircase 10 times in 27:30. Again, the timer does not stop during the descents. Power output: 145 W.

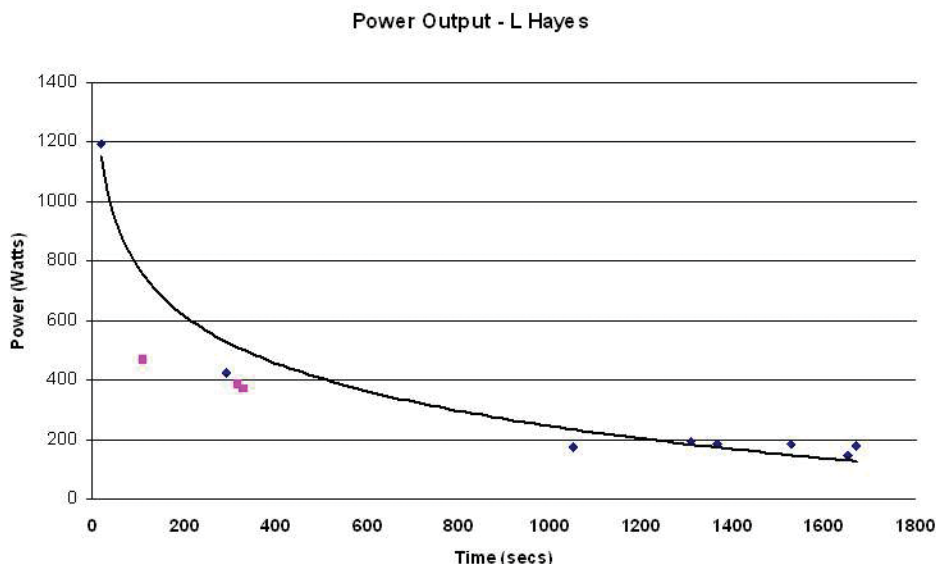
Consider the graph below. It plots time (in seconds) on the horizontal axis and power (in watts) on the vertical axis. These points are plotted from actual data collected during my stair workouts last winter. I also plotted some points I was able to dig up from past years' competitions.

It is reasonable to see the decrease in watts as the duration increases. This is a virtual law of human power output. It happens naturally in nearly all physical events. What is important is that as training progresses, the participant begins to plot points *above* the curve. The "control" curve might include data from the previous season or year. If new points are plotted above, this

translates into more power and can create a new curve. As any CrossFitter knows, the area under that new curve represents increased work capacity.

The graph depicts three points from my pre-CrossFit days. As you can see, they are all below the curve derived from last year's data. This leads me to believe that my stair-specific training combined with CrossFit has produced measurable increases in physical ability.

Additionally, some CrossFitters have embraced yet another measurable and comparable statistic: watt per kilogram of bodyweight (W/kg). This has been a way for members in my training group to compare themselves against partners of varying statures. First off, due to the fact that weight is a critical component of the raw power output formula, the W/kg stat means very little. It does however have great application for other power studies such as a kettlebell snatch test. For stair climbing, I find the W/kg figure to be useful for competitors who lose or gain mass during the examined period, or those competitors who train under load. I frequently train with a weight vest or while carrying sandbags. The W/kg figure helps determine if training time is making my lean body mass more efficient.



The curve represents actual data collected during the author's climbing competitions last year. Particularly noteworthy are the "pre-CrossFit" points (pink) and the "post-CrossFit" points (blue). Many of the blue points fall above the curve, suggesting an increase in work capacity.

Stairing Contest

I understand why stairs aren't programmed into the main-site WODs, probably for many of the same reasons tire flipping is absent: near-impossible standardization and lack of equipment. For many CrossFitters, it's vitally important to measure ability against others, whether they're sharing a pool of sweat in the same gym or competing online from a theater of war on another continent. Adding stair climbing to the main site would spark the same whining as this: "Hey, my tractor tire is bigger and heavier than his!" The differences in stadium stairs and a high-rise fire exit are obvious and preclude any comparisons.

So I ask not for WODs of four rounds of 20 floors and 20 pull-ups. What I do ask is for CrossFitters to keep an open mind to include movements that are not part of main-site programming. Many followers already use garage-gym-friendly parallettes, sandbags, sledgehammers, rings and tires in addition to the equipment needed for the daily WODs. Some of those pieces of equipment do not lend themselves to moving large loads long distances quickly, and their use cannot always be measured. Stair work, on the other hand, can be accurately measured, quantified and analyzed, and the workouts are truly repeatable.

Look for staircases: they might be found in your work building, a local stadium, a friend's apartment high-rise, or a local hotel. Affiliates: I make the same challenge to you. Find a climb (or repeated climb) that becomes a benchmark for your members. Find a stair race in your area. I often find affiliates across the nation assembling teams for local charity events.

Go vertical. It will take your training to new heights.



About the Author

Louis Hayes is a police officer with the Hinsdale (Ill.) Police Department, assigned to the FIAT SWAT Taskforce. He also sits on the board of directors for the Illinois Tactical Officers Association. He's been climbing stairs since he was eight months old, and all the learning bruises are long gone. Louis was the author of the **CrossFit Journal** article [SWAT Shapes Up](#) in March 2009. He also contributes to a for-the-good-of-mankind blog called [Trinity Training Group](#). Louis can be reached at louis.hayes@comcast.net.

The author (wearing cap) and a few of the regulars pose with some of the equipment used during stair-climbing WODs.



Courtesy of Louis Hayes

The Do-It-Yourself Climbing Rope

Lincoln Brigham spends about 15 bucks at the hardware store
and braids his way to a 15-foot climbing rope.

Lincoln Brigham



Lincoln Brigham

Climbing ropes have long been a staple of CrossFit and military training programs.

Rope dates back thousands of years, almost certainly predating the invention of the wheel, making it one of the first tools of prehistoric man. The ability to climb has often been the difference between life and death, success and failure.

1 of 5

Climbing also has a long tradition of providing a great workout for the grip and pulling muscles. Climbing ropes offer a tremendous functional workout, whether used as part of an obstacle course or WOD or in a tug-of-war contest. Rope climbing was even an event in the first several Olympic Games, with the competition being a timed ascent without the use of legs to a height of up to 14 meters.

Despite the obvious benefits of thick rope work, many CrossFit gyms do not have climbing ropes. In some gyms that do, I've heard complaints about the cost and reliability of the equipment. In 2004, CrossFit HQ narrowly avoided a serious injury when the [splice](#) on their commercially purchased climbing rope came undone, sending the trainee tumbling to the ground.

In many CrossFit affiliates, the owners have spliced their own ropes with mixed results. The main complaint with splicing the rope is that, besides the risk of an amateurish splice coming undone, the rope becomes increasingly thick at the top for an inconsistent and sometimes untenable gripping surface. This article offers a cost-effective do-it-yourself (DIY) solution for making your own climbing rope—and we'll avoid splicing altogether.

What You'll Need:

Sizing the Rope and Buying Supplies

The key to this project is taking readily available, inexpensive rope and braiding it into a thicker rope suitable for climbing. We'll take four long strands of rope and use what is called an "eight-strand square braid." The neat trick is that by doubling up the four strands, you create a loop at the top that can be used to secure the rope—no splice needed.

*Words of wisdom for
every project:*

Measure twice, cut once.

The default length and thickness of the rope for this project will be 9-15 feet long and 1.5 inches thick, with a cost of between \$10 and \$20. If that fits your needs, then a quick trip to your local hardware store is all you require. If you want a longer or a thicker rope, the cost, complexity and time needed to finish this project will go up, but not unmanageably.

The rope to get is 3/8-inch braided polypropylene, commonly sold in prepackaged 100-foot lengths for about \$10. Figure that each of the four strands used in the braid needs to be about triple the length of the finished product. A 100-foot package will braid into approximately 9 feet of climbing rope. Two 100-foot packages will result in a 15- or 16-foot climbing rope.

Your investment is time rather than money. You can get everything you need for a rope for between \$10 and \$20.



Lincoln Brigham

If you buy more than one package, get different colors. This will make keeping track of the braiding process much easier, and the end result will have a visually pleasing pattern. Kids in particular love the brightly colored climbing ropes. That said, don't get yellow hollow-core poly rope—even though it's cheap—because it has too much stretch.

Bear in mind that braiding becomes exponentially faster as the rope gets shorter. A braiding project more than 20 feet long is for people with way too much time on their hands and in desperate need of a hobby. A 9-foot rope might take a third as much time as a 15-foot rope. Also note that at the local hardware stores it's only economical to buy rope in 50- and 100-foot increments. Rope by the foot is much cheaper online.



Lincoln Brigham

The starting point: One of the best features of the rope is that the loop you create here will be far stronger than any splice.

Three, Two, One... Go!

Think of this project as a grip workout for time. After you've picked out your rope, cut it into four equal segments and double them over. A heated blade works great for cutting polypropylene because it seals the ends as you cut. Mark the center of each rope with tape. Tie the center of the strands to a post. If you are using two different colors of rope, arrange the strands so that one color (four strands) is in your right hand and the other color is in your left. Leave enough of a loop at the top so that you could pass a 2-inch pipe through it. This will be the loop you use to attach the finished rope to a joist, eye bolt, pipe, etc. The loop should be big enough to pass the finished rope through.

You're just about ready to start braiding. Do you have friends? Workout partners? Someone who owes you money? This would be a most excellent time to grab them. The braiding process will go more than twice as fast if one person braids and another person straightens out the loose ends as you go.

Fair warning: If you want to try to braid a 20-foot rope all by yourself and want to be done by Christmas, I'd suggest starting in November. Better yet, reconsider and find someone who owes you a favor. Have some masking tape handy to tape up a half-finished rope if you want to take a break. Look for the tape now, not later.

The basic braiding pattern is as follows:

1. Line up the strands in columns, one through eight.
2. With four strands in your left hand and four in your right, take the outermost strand in your left hand (Strand 1) and move it over five strands then back under two. Move it back to the inside of the strands in your left hand—it is now Strand 4.
3. Pick out the outermost strand in your right hand, Strand 8. Move it over five strands and back under two. It should be placed back in your right hand, this time as Strand 5.
4. Tighten the braid by pulling your hands apart.
5. Repeat steps one through four until you are at the end of your rope—or your wit's end.

That's it:

Five over, two under. Tighten. Straighten. Repeat.



Lincoln Brigham

Starting with the outside strand on the left, move the strand over five strands and back under two strands. The strand you moved will now be the innermost of the four on the left. Repeat on the other side.

Don't overly tighten the braid for the first few rounds or the loop at the top will be too small. As you braid, keep telling yourself, "Outside left: five over, two under. Outside right: five over, two under." If you have two different colors of rope, one color should always be on the right, the other on the left.

If you've got a partner, switch off at regular intervals. One person braids while the other straightens out the strands. Braiding this stuff is a heck of a grip workout, so if you're doing more than one rope, you can get two- or three-person teams together and compete to see which team can finish first. If you take a break, use the masking tape to tape up the strands in sequential order so you can easily pick up where you left off.

Once you've finished braiding the rope to the desired length, temporarily secure the loose ends with masking tape. If you're in a rush to finish, you can simply wrap some duct tape tightly around the end and cut the tag ends off with a hot knife. For a more professional look, use the instructions below and accompanying diagram to apply a whip finish to the end.

Cut a length of twine or string about 10 feet long. Cut another length of twine about eight inches long. Lay the short length of string in a loop along the rope, and then wind the long twine tightly around both the main rope and the middle of the small loop for about an inch and a half. Be sure to leave the top ends of the loop protruding above the wrap.

Once you've wrapped about 1.5 inches of the main rope, put the end of the twine through the loop, then pull the protruding threads above the wrap to pull the end of the twine upwards. Trim the loose ends of the loop, and use a hot knife to trim and seal the ends of the rope.

Options for Thicker Rope

If you want a rope thicker than 1.5 inches, there are a couple of options. The first option is to simply get thicker rope than 3/8-inch poly. You'll probably have to get this online. Half-inch manila goes for about 33 cents a foot in bulk or \$145 for a 600-foot spool. That should be enough for three 15-foot-long, 2-inch-thick climbing ropes. If you're using manila, tape up the loose ends with masking tape to keep them from unraveling. Braided nylon rope has a soft feel and is available in a variety of diameters. Avoid hollow-core braided rope.



If you need to take a break, use masking tape to ensure you don't lose the pattern. Saying "I'll remember" will usually result in strange knots in your rope.



You can wrap the end of the rope in duct tape and start climbing, or you can go one step further and give your project a professional finish.



To finish the project, a long piece of twine is wrapped around the main rope and a small loop. After about 1.5 inches of wrapping, the end of the long piece is then fed through the loop, which is pulled tight. At that point, you can cut off the ends of the rope below the braid for a slick finish.



To make a thicker rope, use the exact same pattern but braid around a core rope with a diameter of about a half inch.

The other option is to follow the instructions above while braiding a core into the rope. Purchase 3/8-inch or 1/2-inch rope equal in length to the desired finished product. Braid around this core using the same basic eight-strand braiding pattern as before, always keeping the core rope in the center of the eight braiding strands.

Mounting and Safety Considerations

"How much is a rope like this rated to hold?"

That's probably the most common question, but it's not the right question. The rope itself will have a rating well above any 300 lb. trainee attempting to climb it. The real strength of the rope will be determined by how well it is mounted. As any fisherman knows, line usually breaks at the knot. Any failure will be because of fraying at the loop or breakage of the hardware at the attachment. Avoid using cheap eye bolts. Check the loop for signs of wear.

The other safety goal is to reduce the potential and severity of accidents. Murphy's Law of Rope Climbing states that falling climbers will always land on the rope

and thus badly roll their ankles. Therefore, insist that all descents are done hand-over-hand. Just like climbing Mt. Everest, don't climb to the top if you are too tired to climb back down. Use crash pads whenever possible. Have chalk available. When children are around, supervise the ropes or put them out of reach. Never let anyone use the end loop in a tug of war or otherwise wrap the rope around themselves.

So start climbing! Learn techniques to climb with the feet. Work on hands-only climbs. Hang for time. Loop the middle of the rope over the pullup bar, run the ends through the resulting loop and do L-chinups. Get teams of two or three and play tug-of-war.

Have fun!



About the Author

Lincoln Brigham is a certified strength & conditioning specialist (NSCA) and a U.S.A. Weightlifting certified club coach, and he holds CrossFit Level 2, Gymnastics and Nutrition certifications. Lincoln has been coaching Olympic weightlifting since 2001, competes regularly in masters weightlifting, and has been involved in CrossFit since 2003. At the age of 18 months he climbed to the top of an eight-foot-tall bookcase before being caught.



The author's mother documented her son's love of climbing in this painting based on a picture taken in a California lemon grove in 1966.

**Courtesy of
Phyllis Brigham**

Form Follows Function

The goal of CrossFit is producing increased work capacity—but you'd have to be blind not to see that it also produces exquisite physiques.

Russell Berger



In the quest for elite-level fitness, CrossFit has successfully delivered its most devoted followers with another, less-advertised gift: rock-star sex appeal.

CrossFit isn't designed to make you look good naked. That benefit is just an unavoidable side effect of increasing your work capacity at life's most basic tasks. We don't ask our athletes to jump, sprint, push and pull until they can't go any harder because it "ripples muscles" and "tightens loose backsides." We go at unmatched intensity to improve our performance and ability, but dedicated CrossFitters can take satisfaction in knowing that when they look in the mirror they'll see attractive people looking back—people who look like they hunt and kill their food with a spear.

Perhaps Henry David Thoreau said it best: "Success usually comes to those who are too busy to be looking for it." It seems life's most desirable rewards rarely come to those who set out in pursuit of them—but strive instead for excellence, and the rewards of life often find you.

In the business world, this non-linear relationship between self, hard work and the good stuff in life is seen in the rat race for wealth. Setting your crosshairs on early retirement rarely results in the financial success hoped for. Those who look past wealth and strive for excellence, on the other hand, often wake up to find themselves well on their way to prosperity. The principle is laid out clear as day in Level 1 Certs: you can muddle your way through unknowable markets or you can pursue excellence with the belief that free markets will reward excellence.

In fitness, the process of improving one's work capacity delivers an equally obvious reward: aesthetics. Those who focus their efforts entirely on 6 percent body fat and washboard abs rarely find success and don't understand why. Programs such as 10 Minute Abs and Butts and Guts are designed, marketed and fueled by the desire to look good naked, but do they produce results? Spot reduction doesn't work, and there are no shortcuts. Fitness products have little worth without a complementary diet, and a lack of effort and commitment can derail even the best program.

"CrossFit girls," as they are endearingly known, are arguably some of the hottest women on Earth. We aren't talking about the air-brushed and half-starved women of Hollywood—taped, tucked, lighted and Photoshopped to perfection. CrossFit's best female athletes boast outstanding work capacities produced by trained bodies that show the perfect balance of curve and tone. These are lean, powerful women forged from sinew and muscle in the most complimentary tribute to the female form imaginable. And they have great asses. These are women of function, and function is beautiful.





The men of the CrossFit look the part of hunters and warriors. The athletes rival the gold standard of male beauty: the Calvin Klein underwear model (without the boyish fragility used to sell white briefs). Compared to the male CrossFitter, bodybuilders look swollen and exaggerated by hypertrophy, often also suffering from disproportionately large biceps and child-like calves. CrossFit's elite ranks are free of artificially ripped men shaped like martini glasses. These are men who earned their physiques not by using machines but by treating the human body as a machine—and it shows.

CrossFit athletes may be attractive by any standard, but they are, first and foremost, functional. They can move heavy loads long distances in short times. CrossFit's top male and female athletes have demonstrated work capacities that our entire community finds inspiring. From the long-time affiliate owner to his or her newest and most deconditioned client, all are motivated by the powerful force of physical accomplishment. Why not let jaw-dropping physiques do the same?

Glorifying the figures of these athletes isn't a sin against functional fitness. It is not our primary goal to improve physiques, but we would be fooling ourselves if we didn't acknowledge the beauty of these CrossFit bodies at work. Sure, the women doing the 170-meter sandbag hill sprint in Aromas showed amazing athleticism—but was anyone really looking to see what grip they were using on the sandbag? A nice ass is a hard thing to ignore. And a heavy snatch is a beautiful thing when it's stacked on top of powerful deltoids and a six-pack stomach.

CrossFit is and always will be about functional fitness, but it's impossible to ignore the amazing physiques of fit, healthy athletes.

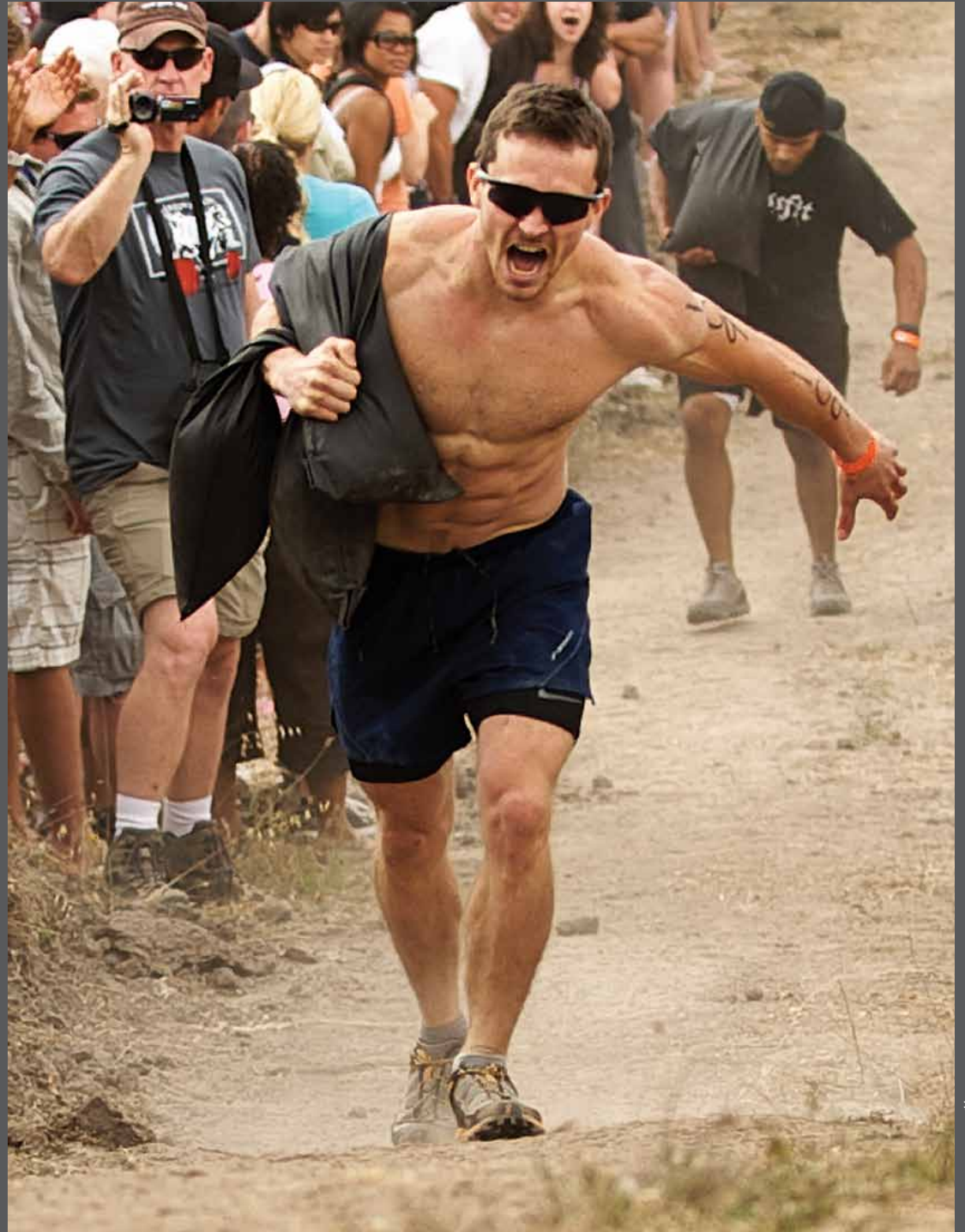
So we won't.



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 Crossville Huntsville.

He currently splits his time between running his gym, training for the CrossFit Games (he won the 2009 Dirty South Regional Qualifier), writing for CrossFit, and spending time with his family.





Jenni Orr, First Place, 2009 CrossFit Games Dirty South Regional Qualifier