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Countering the Crazy Gene

Ute CrossFit's Bobbie Jo Hackenbruck develops a program to rehab injuries and keep members happy. Emily Beers explains.

By Emily Beers **September 2012**

All images: Ute CrossFit

You know the crazy gene, right?

The crazy gene is linked to the feeling of intense satisfaction that comes from throwing yourself into an insanely hard, sometimes senseless physical and mental challenge. We aren't talking everyday challenges. We're talking about the extreme challenges, the kind of day or weekend that leaves you pumping dozens of fish-oil capsules into your neurologically fried and depleted body.

This summer, a CrossFit affiliate posted a video of some dude doing 1,000 muscle-ups for time. Challenging? Sure. Great programming for the average athlete? Perhaps not. But every sport, from gymnastics to marathon running to mountain climbing to skiing, has devout members who want to go to the extreme from time to time.

So the 1,000-muscle-up dude was probably just having one of those days where he submitted to the crazy gene, just like when a mountaineer decides to climb Everest. The muscle-up dude is still not as crazy as marathoner Stefaan Engels, who was bitten by the crazy bug over and over for an entire year; this nut job ran one marathon a day, completing 365 marathons in 365 days in 2010.

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The point is Engels isn't your average running enthusiast and 1,000 muscle-ups for time isn't your average CrossFit workout. A year of marathons and 1,000 muscle-ups in a day are astounding feats that are not recommended for most of the population, but they do show us what the human body is actually capable of.

Performance is related to a host of factors including smart programming, mobility, recovery, rest, nutrition, technique and more.

On the flip side, what's becoming more typical in the sport of CrossFit is a movement away from the crazy gene. Instead, a growing number of CrossFit boxes are trying to help members understand that high performance isn't just about endless volume and ceaseless, unbridled intensity. Performance is related to a host of factors including smart programming, mobility, recovery, rest, nutrition, technique and more.

"Back 2 the Basics"

Bobbie Jo Hackenbruck of Ute CrossFit remembers her early CrossFit days.

"When you start, you're so excited. You see tons of results. You get stronger and leaner. It's amazing," she said. "But then you get a nagging injury that sets you back, and that nagging injury doesn't go away," she continued.

Not only was this Hackenbruck's personal experience in the sport, but this has been the trend she has observed with many of her clients in the last few years. They start out raring to go and they see performance gains for a while, but eventually weeks of ignoring mobility issues and the need for rest start to hold them back. And ultimately when you aren't feeling great, it's hard to keep that CrossFit fire quite as bright.

This trend led Hackenbruck to start believing in the concept that sometimes less can be more. Indeed, CrossFit.com schedules a rest day after every three workouts, and the Level 1 Trainer Course is very clear about how good CrossFit programming is created not by endless volume but by cleverly constructed doses of high-intensity movements. The manual is also clear that rest and recovery are important to success.

"It is also tempting to ignore rest days completely. This may be sustainable in the short term but will likely result in lower overall intensity and potential injury," the manual states.

A few months ago Hackenbruck created an entire program devoted to the concept of training smarter.

Hackenbruck's program is called "Back 2 the Basics." It came about because of a back injury.

"I had a back injury 10 years ago—a herniated disk—and it took me two and a half years to rehab from it," she said.

Last year, Hackenbruck re-injured her back and instantly feared she was in for another long rehab process.

"It made me take a step back and reassess," she said.

She was torn. Hackenbruck desperately wanted to keep CrossFitting, but she knew the high-intensity, high-volume training was too much for her acute back injury at that time.

The CrossFit program calls for intensity in appropriate doses. On some days, "active rest" is the best prescription for your body.

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So she started working with a friend, Robert MacDonald, and together they created a rehab program that focused on strengthening her core. The program still included movements found in CrossFit programming—one-legged deadlifts, Turkish get-ups, overhead weighted lunges, narrow-grip overhead squats—but it wasn't about intensity and time. It was about perfecting movements technically and strengthening areas that were weak, which would ultimately allow her to fully recover so she could go back to pursuing her beloved high-intensity training once again.

> "It can be used to rehab an injury or it can be used as a lighter off-season program for one to three weeks. Or it can just be a recovery week for someone who maybe just did Ironman or a big CrossFit competition."
>
> —Bobbie Jo Hackenbruck

After eight weeks of active rehab with "Back 2 the Basics," Hackenbruck couldn't believe her progress.

"It rehabbed my back completely in just eight weeks and helped me realize that I really need to take a step back from heavy lifting and high intensity sometimes," she said.

It also helped her realize that although performance gains are important, they don't come simply by running through brick walls every single day. It turns out going back to the basics can be important too.

"And it made me realize that I can still be fit by going back to the basics of movements," Hackenbruck added.

Not Every Day Is Test Day

Today, Hackenbruck's "Back 2 the Basics" program isn't just about rehabbing injuries.

The program—including mobility exercises from Kelly Starrett and corrective exercises from Paul Chek and the Chek Institute—is something Ute CrossFit puts all its clients through. And it's something from which they're all benefitting.

"We made everyone come in and try one class," Hackenbruck said. "I explained to them that it can be a one-week program or a six-week program depending on what you need it for. It can be used to rehab an injury or it can be used as a lighter off-season program for one to three weeks. Or it can just be a recovery week for someone who maybe just did Ironman or a big CrossFit competition."

She insisted that everyone can get something out of it, be it a stronger core and hamstrings or strengthened tendons and ligaments. It also helps refine technique and ultimately leads to a well-rested body.

The results speak for themselves.

Since implementing "Back 2 the Basics," Hackenbruck said she's noticed a huge attitude shift among her members, as well as a shift to greater client retention.

"In our gym, people used to get caught up with high intensity all the time," she said.

Since introducing this program, Hackenbruck said her clients realize not every day is test day, and they're staying healthier.

"I really just want our members to respect movements and not just focus on a clock and finishing a workout faster all the time, and this program allows for that," she added.

"Now people confess things like how their neck had been bugging them for a while. People didn't use to say anything because they wanted to be tough and keep coming to CrossFit. But this program has allowed them to keep coming to the gym and actually recover properly."

> "Now if someone has an injury, they tell us about it and then they come in and do Back 2 the Basics instead of the regular programming."
>
> —Bobbie Jo Hackenbruck

Prior to the program, Hackenbruck said she found that usually when clients got injured, they would fall off the face of the Earth until they were able to hit it hard again.

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You can't do Fran every day, and regular body maintenance and technique work can set you up for PRs in the high-intensity WODs all CrossFitters love.

"People used to send us e-mails saying they were injured and taking time off," she said. "Now if someone has an injury, they tell us about it and then they come in and do Back 2 the Basics instead of the regular programming."

Beyond Ute CrossFit

Hackenbruck's program has been so successful that she has had visitors from other boxes come by to try it out.

"People have called us from Hawaii to Washington, D.C., to ask about it, too," she said.

One of these visitors was 31-year-old Heather Smith, whose real name is being withheld for personal reasons. Smith contacted Hackenbruck a few months ago from the D.C. area.

"I came across Bobbie's blog, and I had a herniated disk, too," Smith said. "I related to her and so I wrote her and begged her for her program."

She said she wanted to make sure she was doing the exercises correctly, so she flew over to Salt Lake City to work directly with Hackenbruck. It was worth her while, so she's back in Salt Lake City this summer for a couple of months to finish rehabbing her herniated disk.

"I'm doing Back 2 the Basics three times a week, and I can hike and run again now," said Smith, who also said she is 80 percent recovered.

Next week, she's planning on introducing some more of what she truly loves to do: high-intensity training.

> "We've had clients thank us for this program."
>
> —Bobbie Jo Hackenbruck

"Thanks for Saying Something"

Although it has only been a few months since Hackenbruck started introducing Back 2 the Basics, she said she's thrilled with the results she's seen so far. And more than anything, she's relieved people are buying into the concept that sometimes you have to harness the voice that tells you to keep pushing when your body knows it needs some down time.

"We've had clients thank us for this program. They say, 'Thanks for saying something … for telling us you don't always have to tough it out and that rest days are OK,'" Hackenbruck said. "People are excited about this."

✦

About the Author

Emily Beers finished a master's degree in journalism at the University of Western Ontario in the spring of 2009. Upon graduation, she worked as a sportswriter at the 2010 Vancouver Winter Olympic Games, where she covered figure skating and short-track speed skating. Currently, she hosts ***WOD HOG****, a not-always-PG publication of the CrossFit Vancouver School of Fitness. She ruptured her Achilles tendon in December 2010 and served as the Canada West Regional Media Director while recovering from surgery. Beers also competed in the 2011 Reebok CrossFit Games on CrossFit Vancouver's team. She finished third at the 2012 Canada West Regional.*

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THE CrossFit kitchen KIDS

Sweet Cheeks Headquarters

SANDWICH SUSHI

by Shirley Brown and Alyssa Dazet
Sweet Cheeks Headquarters

overview

Few kids like sushi. It's raw and cold and fishy. But if you substitute in food your kids love to eat, you'll get "sushi" that won't make them squirm!

serves 2 (8 sushi pieces)

ingredients

4 slices of turkey cold cuts

4 slices of ham cold cuts

1 cup julienned carrots

1 cup julienned cucumber

notes

Serve with a side of mustard or guacamole for dipping! Get creative with your sushi. There are endless combinations for this dish. Fill your sushi with red bell peppers, jicama or avocado—and on and on and on.

directions

1. Lay 2 pieces of ham on top of 2 pieces of turkey. Cut away the excess edges so they form a clean-cut rectangle. Then slice length-wise down the middle, so you are left with 2 longer "sushi paper wraps."
2. Lay ¼ cup of carrots and ¼ cup of cucumber on each wrap.
3. Start at one end and roll the carrots and cucumber up in the lunch meat. Place the open-end side down to keep the roll closed or, if necessary, secure with a toothpick.
4. Repeat with the remainder of the meat and vegetables.

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Slapping Fear in the Face

Deborah Cordner Carson successfully battled lymphedema and a fear of water to win the Spirit of the Games Award at the 2012 Reebok CrossFit Games. Andréa Maria Cecil reports.

By Andréa Maria Cecil **September 2012**

All images: Staff/CrossFit Journal

Tyler Quinn lay in his bed, hanging on to every word announcers Justin Judkins and Sean Woodland uttered.

"I was in my room listening to the stream and holding my breath," he said.

More than 50 minutes into the phonecast of the Camp Pendleton swim-bike-run that opened the 2012 Reebok CrossFit Games, Judkins described Deborah Cordner Carson as "still battling those waves" and "battling the surf."

"I didn't know if she was standing in the water or actually swimming," said Quinn, Cordner Carson's coach.

Last year, the athlete withdrew from the Games in the opening event that also included an ocean swim because of her fear of open water.

Less than a minute later, Quinn heard the magic words come from Woodland's mouth: "Deborah Cordner, we just heard, has actually rounded the last buoy. She is coming out of the water. She finished the event. She's obviously out of contention for this one, but huge, huge victory—personal victory—for Deb Cordner because, again, if she had tapped out, it's over."

Quinn slammed his pillow.

"To us in Minnesota, it was a pretty exciting moment," he said. "I don't care if it's a fear of spiders or a fear of falling or a fear of waves and you get over it—it's a gigantic victory. We're all excited for her."

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Finishing the swim, Cordner Carson said, was indeed "awesome."

> "I think I'd be foolish if I said that I've completely overcome it."
>
> —Deborah Cordner Carson on her fear of open water

She thought to herself, "'I get to actually continue and compete in the CrossFit Games for the first time.' It was really cool."

Still, Cordner Carson's fear hasn't been vanquished.

"I think I'd be foolish if I said that I've completely overcome it. It was one ocean, one day at the CrossFit Games that I made it through," she said. "I can't pretend that that didn't happen last year."

A Respect for the Water

Cordner Carson's parents are from Trinidad. Nearly seven miles off the northeastern coast of Venezuela, the island is surrounded by the Caribbean Sea, the North Atlantic Ocean and the Gulf of Paria. Although she was born in Minnesota, she visited Trinidad as a child with her family.

"My uncle is a great swimmer," she said. "He can kill a shark with a spear."

As a little girl, Cordner Carson went for a fearless, carefree dip in the waters off Trinidad. She saw a wave coming but didn't think too much of it.

"I got pummeled," she recounted. "I remember not knowing what was up or down."

Her aunt plucked her from the water.

"'What are you doing?'" the adult asked her.

Like most children, Cordner Carson didn't have a good answer.

"'This is no joke,'" she recalled thinking. "'You don't just jump in here thinking you can swim.'"

And so her view on the water changed.

"At that point, I had a healthy respect for the ocean," Cordner Carson said.

She paused and then added: "Was it that? Maybe. I just never had much practice."

Immediately after last year's Games—when Cordner Carson took herself out of contention by withdrawing from the opening event at the Santa Monica Pier—she went home to Minnesota and started swimming.

She joined a swim class that met at 5:30 a.m. twice a week.

"I was getting more comfortable in the pool," she said. "Once it got (warmer) in Minnesota, I went to the lakes."

But in the open water, the form she had honed in the pool faltered.

"It was really discouraging because I had hopes I would get in and be amazing or something," she said with a laugh. "In the middle of a lake, you don't have an option: you would either swim or die."

The crashing waves of the Pacific were terrifying to Cordner Carson, who had difficulty getting through her practice sessions in Minnesota's calm lakes.

Mentally, Cordner Carson said, she would almost sabotage herself in the open water and begin hyperventilating.

"It made me nervous for the Games," she added.

Judgment Day

When Games Director Dave Castro announced the surprise swim-bike-run that would kick off the Games two days before their expected start on July 13, Cordner Carson "passed over the swim part in my head."

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"I didn't want to think about it until I got back to my hotel room and was with people I felt comfortable expressing my emotions with," she explained.

What ensued was a snowballing fear that consumed the 32-year-old.

The swim was about 700 meters total, running out from the beach at Camp Pendleton, then turning parallel to the shore for the bulk of the distance before heading back to the beach. The route was marked with buoys, and a host of support personnel dotted the ocean on paddleboards and watercraft.

"I was thinking of the distance in my head: 'OK, I know what 400 meters is. I know what that looks like,'" the former college sprinter said to herself. "'I don't know how I can swim that long.'"

The day before the event, Castro and Marine Capt. Greg Johnson from Camp Pendleton briefed athletes on what to expect. Johnson talked about rip currents, rocks, sharks and other dangers to keep in mind.

"They made it sound horrible," Cordner Carson recalled. "Everybody was kind of laughing, kind of scared. … I don't think anybody took it to the level I did."

So when Cherie Chan, a media commentator during the Games, asked to talk to her, Cordner Carson declined an interview for the first time. She was on the verge of tears and hadn't slept because she had been up all night texting Quinn, who was still in Minnesota.

Cordner Carson, overcome with fear, was on the verge of withdrawing from the Games for a second time.

At that point, Cordner Carson fully expected to withdraw from the Games for a second year.

> "I didn't want to be a horrible example of a CrossFit athlete. I felt like I was just letting everybody down."
>
> —Deborah Cordner Carson

"We prayed and did everything, and I just came to terms with the fact that, you know what, it sucks this is going to happen again. My fear is going to overcome me, and unfortunately this is going to happen again," she said. "I didn't want to be a horrible example of a CrossFit athlete. I felt like I was just letting everybody down."

The hour and a half bus ride from the Los Angeles area to Camp Pendleton was silent.

Cordner Carson was absorbed in her thoughts—and her fear.

"There was a little part of me that was like, 'Maybe you can do this. It's not so bad.' Then there's another part of me that was like, 'Are you kidding? You can't do this!'"

As she talked to one CrossFit employee after another, each one said the same thing: Yes, you can.

"No one would let me quit. That's what it felt like," Cordner Carson said. "At one point, it felt like, 'You can't make me do this.'"

In one way, she felt embarrassed.

"The one time I ever made it on national television, it was you seeing me fail and crumble over something I wasn't able to do," she said, referring to the 2011 Games aired on ESPN platforms. "If it happened again, it would just be so hard."

Moments before the event, with waves crashing in the distance, Cordner Carson was all but ready to withdraw. She spoke with CrossFit staff member Angel Forbes, who said she should talk to Castro. During a quick meeting on the beach, Castro told Cordner Carson she had to try.

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Then Cordner Carson started to think, "'Why is my ego getting in the way of me trying, at least? How am I letting all this hoopla of how big CrossFit has gotten … get in the way of who I am?'"

> "I was like, 'Yeah, I'll try. What the hell, Deborah? Try.' So, yeah, I tried."
>
> —Deborah Cordner Carson

So she made a decision.

"I was like, 'Yeah, I'll try. What the hell, Deborah? Try.' So, yeah, I tried," she said. "I took it one step at a time—literally. I got into the ocean very slowly and tentatively."

Cordner Carson was dead last on the swim. She didn't care.

"One little tiny stroke at a time," she made her way through the ocean.

Between the third and fourth buoy, she could see the other competitors hopping on their bikes.

"I couldn't believe I was actually going to make it," she said.

But what followed wasn't exactly a walk in the park.

The leg garment she wears because of her lymphedema was wet, meaning it was no longer effectively providing the compression she needed. Lymphedema is a condition where lymphatic fluid accumulates in the interstitial tissue and causes swelling, most often in arms and legs.

"I had to just suck it up," Cordner Carson explained. "That's one of the reasons why I never swam really after lymphedema."

Once the swim was out of the way, Cordner Carson made up ground on the bike and the run despite the pain in her leg.

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The bike ride was lonely for a while. The run—typically her strength—was the most difficult because of the pain in her leg.

Still, Cordner Carson managed to catch up to some of the other competitors and even give them pointers on running.

When she finished the swim-bike-run event, her body started cramping uncontrollably. Intravenous fluids from the medical staff helped.

> "It's an award that stands for more than just the competition … this is the foundation of CrossFit."
>
> —Tyler Quinn on Deborah Cordner Carson receiving the Spirit of the Games Award

"I would never advocate anyone with lymphedema doing that," Cordner Carson said.

Nonetheless, CrossFit, she said, forced her to make it all work despite her condition.

"It's nice not to make excuses," Cordner Carson said. "It's just another thing I can do now with lymphedema, so that's cool."

Her courage in the face of fear and adversity earned her this year's Spirit of the Games Award, following such CrossFit legends as Annie Sakamoto in 2011 and Chris Spealler in 2010.

"It was pretty unbelievable," Cordner Carson said. "I mean it's hard to put into words."

Although Cordner Carson doesn't wear her emotions on her sleeve during competition, Quinn said the athlete was tremendously humbled by the award.

"That will be a moment in her life that I don't think she will ever, ever forget," he said. "I think she's really proud to be a part of that. It's an award that stands for more than just the competition … this is the foundation of CrossFit."

Cordner Carson earned the Spirit of the Games Award by showing courage, determination and heart.

Managing Fear

Swimming in the ocean, Cordner Carson said, has given her confidence not only in tackling water but also other hardships life might throw at her.

"I can do it," she explained. "It's going to be hard, it's going to be really sucky, but it really won't be that bad."

Her advice: Take it one step at a time.

With a plan, anticipatory anxiety can be controlled, said David Yukelson, director of sports psychology services for the Morgan Academic Support Center for Student Athletes at Penn State University.

"If it's really fear of the unknown, fear of the uncertainty—which are sources of the anxiety—you get the athlete to focus on what they have in their immediate control," he said.

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Once on land, Cordner Carson showed off her speed, agility and strength, finishing 13th overall.

Although the fear might be so overwhelming that it triggers physiological responses—such as an elevated heart rate or tense muscles—the goal is to overcome it by redirecting thoughts, Yukelson continued.

> "The big thing in controlling it is identifying it and almost slapping the fear in the face."
>
> —David Yukelson

Mantras, he said, can help:

"Be strong in the water."

"Trust my technique."

"It's a mile and a half—I can do this."

"The big thing in controlling it is identifying it and almost slapping the fear in the face," Yukelson explained.

Focus on what you're going to do and don't worry about what could go wrong, he said. And, yes, it is possible to overcome a fear, Yukelson said.

"But the person has to have the willingness to address their fears," he said. "(There must be an) understanding of where the fear is and dealing with it as opposed to being overcome by it."

He called the preparation "ammunition to be able to fight back" and "the opportunity that I've been waiting for."

Quinn might agree.

After last year, he told Cordner Carson he would be unhappy if there wasn't a swim at the 2012 Games.

"She was shocked to hear that," Quinn said.

"'Let's just say you go out there and win the CrossFit Games and didn't have to swim,'" he told her. "'Look, we need this. We need this to be part of not your CrossFit experience, but your life experience.'"

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This year's Games helped Cordner Carson smash her fears and come out a stronger, more confident athlete.

Quinn also said to Cordner Carson: "'If you get last place by a mile, I don't care.'"

But she didn't.

Cordner Carson finished 13th overall in the Games.

Now for 2013

"It was a gigantic step," Quinn said of Cordner Carson's ocean swim. "In another situation, if she had not done the swim and been disqualified from the 2012 Games, I don't think you would have heard much about her next year. We're all pretty excited about this upcoming training year."

> "The last two years that she's been out there, she's come back with a better sense of herself as an athlete."
>
> —Tyler Quinn

Needless to say, there will be more open-water swimming in Cordner Carson's future. Triathlons, specifically.

"Just saying that is easy to say, but it still scares me," she noted. "It freaks me out a little bit."

While Cordner Carson is "competent" in the water, she's "still bad at swimming," Quinn said, and that has to change.

"I think Deb is a podium competitor," he said. "And (there are) going to be people out there who disagree with that, but I don't care. I know what she's capable of. The last two years that she's been out there, she's come back with a better sense of herself as an athlete."

Part of that has come through surrounding herself with the right people—people who have "helped me through my fears," Cordner Carson said.

"Certain experiences are put in your way for a reason. Because on the other side … you're so much stronger and you're so much closer to the person you've dreamt to be," she said. "I'm so grateful for the person I've become. I never could have dreamt this up in a million years. It makes me almost grateful to have lymphedema in a weird way."

As for 2013, Cordner Carson is expecting even more of herself.

"I don't want to go to the CrossFit Games being scared of anything."

✦

About the Author

Andréa Maria Cecil is the Regional Community Media Director for the Australia, Europe and North East regions. She was also the North East Regional Media Director for the 2012 Reebok CrossFit Games. Cecil has been a freelance writer and editor for the ***CrossFit Journal*** *since 2010 and also writes for the CrossFit Games site. She spent nearly 13 years as a professional journalist, most recently as managing editor of the* ***Central Penn Business Journal*** *in Harrisburg, Pa. The 34-year-old is a native of New Orleans who lives in York County, Pa. There, she's been doing CrossFit since 2008 at CrossFit York, where she coaches Olympic weightlifting as a USA Weightlifting Level 1 Sports Performance Coach. Additionally, Cecil dedicates four days a week to training the Olympic lifts herself at McKenna's Gym.*

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THE CrossFit LIFE

The Hangover, CrossFit Style

Everything is different when you do CrossFit—even Las Vegas. Jeremy Striffler reports on a trip to Vegas that included more barbells than bars.

By Jeremy Striffler **September 2012**

Joe Marsh

At high noon on the Friday of Memorial Day weekend, I found myself running around a parking lot in Las Vegas with a group of strangers. We were taking a lap around the large industrial building that houses CrossFit Las Vegas with medicine balls on our shoulders and the infamous Strip off in the horizon.

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I had touched down in Las Vegas just an hour before to celebrate my 30th birthday with my two best friends from college. A year ago, I would have predicted a weekend of excessive drinking, eating and minimal exercise. I pictured *The Hangover*, with me in the Ed Helms role—missing tooth and all. The only calories burned would be from walking from the chaise lounge to the tiki bar to order another round. Thankfully, I started CrossFit last summer, and that was far from what happened.

That's not to say I didn't have a lot of fun, drink a few beers and gamble some money, but I found a more satisfying trip based on quality rather than quantity. More clean living than Sin City. Perhaps it's due to age and maturity, but I think my adoption of the CrossFit culture was a huge contributor.

Hitting the Bars

My taxi driver at the airport was a bit confused that my first destination in Las Vegas was a gym. He was used to shuttling people straight from the baggage carousel to the roulette wheel. But I was happy to put off the slot machines for a little longer to experience my first visit to a different CrossFit affiliate.

Matt Kovalcik

Itinerary of a CrossFitter: first the gym, then the Strip.

Driving along Dean Martin Drive, away from all the action on the Strip, we passed numerous industrial buildings and motels. I arrived with my entire luggage at the gym and no one batted an eye. I wasn't their first visitor, and in fact there was another CrossFitter from Oregon who had just arrived as well. We were both warmly greeted by the coaches and owner Joe Marsh, who led the noon class.

I quickly changed into my workout clothes and unpacked my two CrossFit go-to's in my carry-on: my lifting gloves and my jump rope. Walking into the enormous gym, I was overwhelmed by the new surroundings. CrossFit Las Vegas is 10 times the size of my beloved TwinTown CrossFit (TTCF) in Minneapolis and has the largest, scariest-looking ceiling fan I have ever seen in my life.

The gym had 30-foot-tall ceilings and enough room to host a small casino floor. There was equipment everywhere. As many CrossFitters can relate, new and different equipment is always exciting to see.

There was enough room on the floor for the rowing machines and racks at the same time. Further, like something out of a Cirque du Soleil act, a dozen sets of rings were lowered from the ceiling for the other class that was going on at the same time. (Did I mention there were two classes taking place, with plenty of elbow room to spare?) It was going to be very different to have so much breathing room.

Having completed the lap around the building, the class got down on the floor to do some stretching with the foam rollers. With the roller under our shoulders and our hips extended, we did a variation on thoracic extension with our arms overhead. Joe didn't hesitate to get in close and help.

"I don't know you but I am going to do this anyway," he said as he pushed my arms back, allowing me to feel the full stretch.

Throughout the workout, Joe treated me like a regular, providing instruction and encouragement. The other men and women working out also contributed to the welcoming environment, which seems to be one of the biggest differentiators between CrossFit gyms and every other chain out there.

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Matt Kovalcik

Gamble in the casinos, play it safe with your health.

After working on push jerks, it was time for a combination of Tabata rowing and kettlebell swings. After an intense 8 minutes of work, I was happy to collapse on the floor. We finished the hour with everyone lying down and stretching with bands. Overall, it was the epitome of a great CrossFit workout: it combined a variety of movements and exercises and worked a variety of muscles.

Working out with showgirls and members of the Thunder From Down Under was definitely unique (at least they all looked like they could be performers on the Las Vegas Strip). And while my allegiance will always be to TTCF, it was great to visit another affiliate.

Much like visiting a Hard Rock Café in every city, I imagine a lot of fun can be had in going to CrossFit gyms across the United States and globe while traveling for business or pleasure. And similar to tradition at that restaurant franchise, I've got my CrossFit Las Vegas T-shirt as a treasured souvenir.

Beyond the Buffet

Traveling to Las Vegas, like many other vacations, can quickly devolve into a few days or an entire week of bad eating habits. Every casino along the strip, from the discount to the deluxe, offers buffets that cater to excess. One can spend all day staring through sneeze guards and sifting through mountain-high piles of shrimp cocktail and dessert trays. I wanted a more dynamic dining experience.

Teddy Kim, owner of TTCF, often explains that "in CrossFit we refer to nutrition as the 'metabolic foundation of health.' CrossFit is not even remotely coherent absent the nutritional prescription. Many a new athlete is dismayed to learn that you don't stop being a CrossFitter when you sit down to dinner."

We can all have our cheat days, especially on vacation, but I wasn't about to allow my trip to deteriorate into a weekend of regret. So rather than buffets and bad eating habits, I picked out a few high-quality restaurants by master chefs like Thomas Keller, José Andrés and Mario Batali to enjoy with my friends. I was conscious of the food I ate and sought out menus full of interesting and flavorful ingredients.

It's too easy to let yourself off the hook while on vacation. The problem with not holding yourself accountable is that the bad habits that happen in Vegas don't just stay in Vegas. They rear their ugly head the minute you get back home. Being healthy and being on holiday don't have to be exclusive.

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Matt Kovalcik

If marksmanship ever comes up in a WOD, Striffler will be ready.

The culinary tour throughout the weekend began the first night at Carne Vino, where my friends and I toasted my birthday with a nice glass of red wine. This large steakhouse by Chef Mario Batali at the Palazzo welcomed a large crowd but offered plenty of breathing room at the table for my buddies and I to catch up. I feasted on bison carpaccio with garlic, radish greens and basil, and a main entrée of veal scalloppine porcini with a side of fresh string beans.

The second night led us to the Public House at the Venetian, a contemporary take on the British gastropub. I enjoyed a small serving of crispy frog legs with tomatoes, brown butter and lemon herb. It was followed by an all-natural, grass-fed beef burger with bacon marmalade, gruyere cheese, roast tomato, frisée and Guinness aioli.

The final night of our great weekend finished at Chino Poblano, a Mexican-Chinese fusion restaurant from Chef José Andrés, which is decorated with images of Frida Kahlo and Mao Tse Tung and located at the Cosmopolitan. The menu offered a wide selection of small plates. I got to try and enjoy some sui mai scallops, a braised baby pig/pork rind/spicy salsa verde cruda taco, and a shredded duck taco.

A New Normal

My weekend in Las Vegas was reflective of my new way of thinking brought on by CrossFit.

I found fun in physical activity and not excess. Waking up clear-headed and happy the second day, I enthusiastically went for a 4-mile run on the Las Vegas Strip past the gondolas of the Venetian, the stunning waterfall at the Wynn, the red and white tent of Circus Circus, the remains of the historic Sahara and the famous Chapel of the Bells. In the warmth of the morning, I saw the city from a very different perspective. There is nothing like running past revelers who still haven't gone home at 8 a.m.

I also went out of my comfort zone during the weekend, something I learn to do more and more every day at TTCF. At Machine Gun Vegas I got to fire off multiple rounds with a hand gun, shotgun and submachine gun. Shooting guns might not seem to directly correlate to lessons learned in the gym, but I find a similarity in the confidence gained and a desire to live a life where I don't settle for just sitting on the couch.

Thanks to CrossFit, my travel itinerary was totally transformed.

✦

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Consortium for Health and Military Performance and American College of Sports Medicine *Consensus Paper* on Extreme Conditioning Programs in Military Personnel

An Answer

By J. A. Glassman, PhD, CrossFit Chief Scientist

ABSTRACT

An epidemic in military cases of rhabdomyolysis is a reporting error at the expense of an under-reporting of classic heat stroke, two potentially fatal types of exertional heat illness (EHI) indistinguishable in their initial and milder forms. The opinion of the authors of the subject paper that a companion increase in other exertional injuries might be looming is unsupported and contradicted by military studies. None of those studies includes any significant injuries in trials preliminary to replacing traditional military physical training (PT) with the CrossFit® conditioning program. EHI, which includes rhabdomyolysis, has been rising at 5.5% per year over the last eight years, and is correlated ($R^2 = 83.8\%$ at a 6.5-year lag) with a sudden rise in military deaths attributable to the War on Terror. The authors' opinion that CrossFit is a cause of increased injuries or illness absent any data is beyond science, and without data in a lead-lag relationship, it is a scientific error in causality.

CrossFit workouts are less extreme than those of ACSM-sanctioned military PT. It is safer than military PT because it tends to limit rhabdomyolysis, the rupturing of skeletal muscles, from developing into Acute Kidney Failure. CrossFit workouts typically last no more than about 20 minutes, which with normal hydration initially, minimizes the dehydration essential to rhabdomyolysis first interfering with normal kidney function. CrossFit workouts generally mix anaerobic and aerobic exercises, tending to neutralize metabolic acidosis. Therefore CrossFit minimizes the contribution of acidosis to the breakdown of urinary myoglobin into toxic elements in the pathogenesis of severe rhabdomyolysis. CrossFit workouts include individualizing through scaling or substitution of movements, as required, and always by prescribing an individual's best effort. Individualizing marginally stresses each athlete to his current capabilities, tending to limit muscle damage to those microtears desirable in physical conditioning, a necessary state of mild rhabdomyolysis. Because the individual determines the intensity of each of his workouts, CrossFit is not suited to the regimentation of group drills that lead to overexertion, clustering of cases, and intermediate rhabdomyolysis recognizable by darkened urine.

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PART 1

PART 1:

EXERTIONAL HEAT ILLNESSES, INCLUDING RHABDOMYOLYSIS, AND PARTICIPATION IN CONDITIONING PROGRAMS ARE GRADUALLY RISING IN RESPONSE TO WAR TIME RISKS, AND NOT THE TROOPS' VAIN DEMAND FOR GETTING RIPPED.

Published records show exertional rhabdomyolysis (ER) in military training rising in epidemic proportions–at 166% per year, as shown in the next chart[1]:

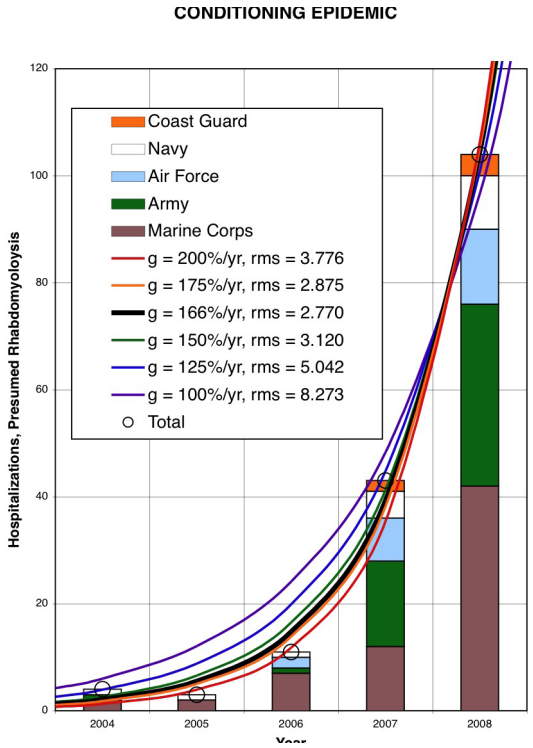

Figure 1
Hospitalizations for presumed exertional rhabdomyolysis in the first five years was growing exponentially at 166% per year, an extreme epidemic.

At the same time, evidence shows that the CrossFit conditioning program is growing at about 50% per year in the number of affiliates[2], and approaching 90% per year as an open-source Internet activity–extraordinary rates of growth among start-up companies, and unprecedented in both method[3] and marketing[4]. The CrossFit growth rate is reflected in a demand for its conditioning among trainees of all services, a demand that has led to military trials with its adaptation by Canadian Forces, U.S. Army commands, and the U.S. Marine Corps to replace traditional physical training programs comprising calisthenics and running.

1 Original chart in AFHSC, Medical Surveillance Monthly Report (MSMR), No. 16-3, March, 2009, p. 11, Figure 2. www.afhsc.mil/viewMSMR?file=2009/v16_n03.pdf
2 Private correspondence from Kathy Glassman, Lynne Pitts.
3 Functional movements, high relative intensity (i.e., individualized conditioning), short sessions with ample rest periods.
4 Open source, no paid advertising for products, services, or members. View Internet activity on Google Trends > CrossFit.

From this evidence, the subject *Consensus Paper* determines the following:

> A potential emerging problem associated with increasingly popularized extreme conditioning programs (ECPs) has been identified by the military and civilian communities. That is, there is an apparent disproportionate musculoskeletal injury risk from these demanding programs, particularly for novice participants, resulting in lost duty time, medical treatment, and extensive rehabilitation. This is a significant and costly concern for the military with regard to effectively maintaining operational readiness of the Force. While there are certain recognized positive aspects of ECPs that address a perceived and/or actual unfulfilled conditioning need for many individuals and military units, these programs have limitations and should be considered carefully. Moreover, certain distinctive characteristics of ECPs appear to violate recognized accepted standards for safely and appropriately developing muscular fitness and are not uniformly aligned with established and accepted training doctrine. Accordingly, practical solutions to improve ECP prescription and implementation and reduce injury risk are of paramount importance. *Id.,* Abstract.

> Muscle strains, torn ligaments, stress fractures, and mild to severe cases of potentially life-threatening exertional rhabdomyolysis are reportedly occurring at increasing rates as the popularity of ECPs grows (4,27). *Id.,* p. 383.

Two unwarranted assumptions in the abstract complicate any response. First, the *Paper* generalizes from problematic rhabdomyolysis data by adding a subjective, independent, anecdotal, chance of musculoskeletal injuries.

The word *rhabdomyolysis* derives from three Greek combining forms, rhabdo- (striated) + myo- (muscle) + -lysis (rupture). According to the International Classification of Diseases (ICD), 2009 (ICD-09), rhabdomyolysis, code 728.88, is one of the "disorders of muscle ligament and fascia", 728.8, within "Diseases of the Musculoskeletal System and Connective Tissue, 710-739. While no specific agent causes rhabdomyolysis, over one hundred causes and co-factors are known (see list, Part IV, Walsh, ¶4.4.6), listed in 14 categories. In the final diagnosis, rhabdomyolysis includes abnormal levels of muscle proteins, specifically myoglobin (Mb) and creatine kinase (CK, also known as creatine phosphokinase (CPK)), in the blood or urine, but estimates of normal levels vary widely. It is an injury to the musculoskeletal system distinct from strains, torn ligaments, and stress fractures.

The authors' added risk is a presumption for which the only evidence is contradictory. One such contradiction is the non-trivial absence of injuries during the several military CrossFit trials. An old saw is that the absence of evidence is not evidence of the absence, but the failure of responsible investigators to report injuries would be an error of omission. Reason creates a significant exception to the saw for studies on the effectiveness of a conditioning program: the absence of any injury report implies that no reportable injuries occurred.

Another contradiction is from a recent ACSM-sponsored conference. Nora Constantino, PhD, FACSM, and James Fitzsimmons, PhD, reported that UNR (University of Nevada, Reno) CrossFit had conducted 87,000 supervised workouts with only one injury: a strained ligament that had been recently repaired.

A third contradiction is found in the presentation by E. Zambraski (¶2.5.1, below) at the subject Conference. He included this as his Chart 9:

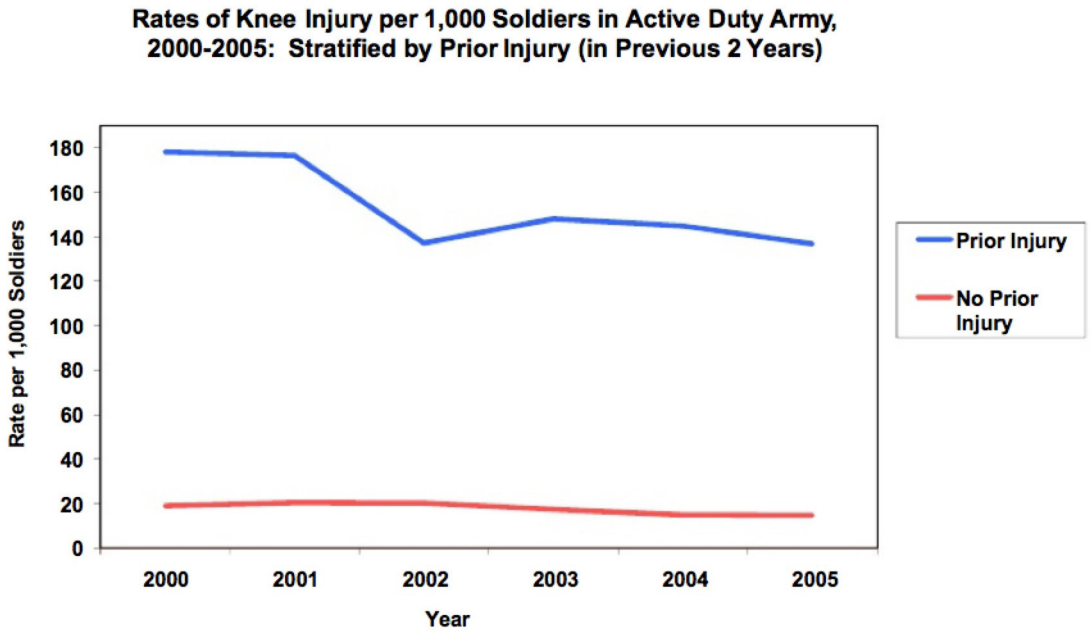

Figure 2
Musculoskeletal injuries declined over the available record, from 2000 to 2005, if the knee was indicative.

This chart illustrates Zambraski's previous, Chart 8, on "Risk Factors for Muscle Injury", in which the first bullet is "Prior Injury". That title along with Chart 9 suggests the author considered the knee to be a muscle, but more relevantly that it is part of the musculoskeletal system allegedly undergoing "disproportionate … injury risk".

The Textbooks on Military Medicine, available online from the Army's Borden Institute, U.S. include a treatise called "Musculoskeletal Injuries in the Military Training Environment" (2002) by Cowan, et al. See excerpts below, Part IV, §4.3. This is an excellent reference for understanding musculoskeletal injuries, but it provides no support for claims in the *Consensus Paper* of an increase in injuries. It does say, however, that the majority of training-related injuries in the military are lower-extremity injuries,[5] and knee injuries rank third after muscle strains and ankle injuries.[6]

None of the data contains a hint of an emerging problem, at least as of 2005. If extreme workouts are causing the claimed disproportionate injuries, how does it happen that the knee, a classically susceptible joint, is immune? The explanation might lie in the fact that the knee injuries are for 2000 to 2005, while the alleged emerging problem is post 2004, dating from the time that rhabdomyolysis was first coded by ICD. This choice of data is not CrossFit's, but the authors and the conference participants, who should explain the discrepancy.

The only data supporting the *Consensus Paper*'s opinion of an "emerging problem" are the service reports on exertional rhabdomyolysis.

5 §4.3.3, below.
6 §4.3.4, below.

1.1. Severe exertional rhabdomyolysis is unambiguous, but the distinctions between stages of rhabdomyolysis is pragmatic.

Rhabdomyolysis was first recognized as a disease among victims of crush injuries in the London blitz in 1940-1941. It was not listed in the 1999 Merck Manual (17th Ed.). It received its first specific code in ICD in 2004, and the Merck Manual first acknowledged rhabdomyolysis in its 18th Ed., in 2006. During this time, the Textbooks on Military Medicine were recognizing exertional rhabdomyolysis as a syndrome within a syndrome:

Exertional heat illness (EHI) encompasses a spectrum of disorders deriving from the combined stresses of exertion and thermoregulation. These include exertional dehydration, heat cramps, heat exhaustion, heat injury, heat stroke, rhabdomyolysis, acute renal failure, and hyponatremia. Early in the course of EHI it may be **difficult or impossible to distinguish** these entities and, in fact, they often overlap and are differentiated as the clinical manifestations evolve. They represent primarily a **continuum of multisystem illnesses** related to elevation of body core temperature and the metabolic and circulatory processes (including changes in fluid and electrolyte balance) that are brought about by exercise and the body's thermoregulatory response.[7]

Gardner classifies rhabdomyolysis as mild or severe,[8] where severe rhabdomyolysis includes life-threatening complications.[9] Vogel identifies exertional rhabdomyolysis by "myoglobinuria [myoglobin in urine], muscle pain, weakness, and soreness."[10]

Apart from myalgia [muscle pain], the initial clinical sign of rhabdomyolysis is the appearance of discolored urine. The presence of myoglobin gives urine a brown-red color. … If myoglobin is more than 25 µg/ml, urine gets a dark brown red color. Efstratiadis.[11]

However,

> Myoglobin is rapidly and unpredictably eliminated by hepatic metabolism. Therefore, tests for myoglobin in plasma or urine are not a sensitive diagnostic procedure.[12]

Serum myoglobin has a half-life of 2-3 hours.[13] Myoglobin in urine is unstable at low pH, with a half-life of 2.1 hours at pH = 4.5, and 45 to 70 hours at pH > 6.5.[14]

Besides being difficult to measure, the myoglobin molecule is not toxic until it is cleaved in an acidic medium.[15] Therefore the normal treatment for preventing mild exertional rhabdomyolysis from becoming severe requires alkalinizing the urine to at least 6.5.[16] However, the fact that the darkened urine has disappeared could signal greater danger for the athlete, that the myoglobin has disintegrated into particles toxic to the kidneys.

Mild and severe rhabdomyolysis may be considered two distinct forms, each difficult to diagnose. Muscle destruction is always present during physical conditioning.[17] Under normal condtions, another authority teaches:

7 Bold added, Gardner, Textbooks on Military Medicine, (2002), Part IV, §4.2.1, below.
8 Gardner, *id.*, §4.2.2, below.
9 Gardner, *id.*, §4.2.3, below.
10 Vogel, Textbooks on Military Medicine, (1999), Part IV, §4.1.13, below.
11 Efstratiadis (2007), *id.*, p. 134. The figure of 25 mg/ml is likely a typographical error for 250 mg/ml.
12 Vanholder, R., et al, "Rhabdomyolysis", J.Am.Soc.Nephrol. 11:1553-1561, 8/1/2000, p. 1557.
13 Hamilton, R.W., et al., "Myoglobinuria, Hemoglobinuria, and Acute Renal Failure", Clin.Chem. 35/8, 1713-1720 (1989), p. 1716
14 Calculated from Chen-Levy, Z., et al., "Factors Affecting Urinary Myoglobin Stability In Vitro", Am.J.Clin.Pathol., 2005; 123-432-438, p. 436, Figure 1.
15 Efstratiadis (2007), ***id.***, p. 133.
16 Sauret, J.M., et al., "Rhabdomyolysis", American Family Physician, 3/1/02. http://www.aafp.org/afp/2002/0301/p907.html?printable=afp
17 Vogel, §4.1.8.

> In general, the diagnosis of rhabdomyolysis depends on clinical impressions and on the patient's symptoms, with laboratory results for confirmation. However, in about one-fourth of the cases – e.g., in nontraumatic rhabdomyolysis – the symptoms are vague, and biochemical analysis is necessary for diagnosis.[18]

The clinician is thus dependent on his medical interview especially to differentiate between exertional rhabdomyolysis and other forms, or to discover aggravating co-factors. When the NYPD Police Academy experienced a cluster of rhabdomyolysis cases in 2002, it attempted to discover the cause by a 15-page questionnaire. It met with such resistance for reasons of privacy and bias from refusal to respond to certain questions that it had to be abandoned.[19] Those reasons seem particularly strong in any group environment where the individual is bound by codes, regulations, contracts, and the sagacity of deference.

Laboratory tests while essential cannot be definitive. Threshold levels have not been established for muscle products considered essential because upper healthy ranges overlap the lower disease ranges:

> An increase in both serum myoglobin and serum CK of up to 40 times the upper reference interval has been detected in healthy military recruits (27) and in Olympics trainees performing strenuous exercises.[20]

Unfortunately, neither Efstratiadis nor a literature search supplies the elusive upper reference levels. One of the CHAMP authors says,

> Although the diagnostic criteria for ER are somewhat controversial, clinical practice guidelines recognize a serum CK level ≥ 5 times normal and a urine analysis positive for myoglobinuria as diagnostic.[21]

Deuster, et al., do not provide those critical normal levels, but their discussion reveals that the patterns of these chemistries along with muscle pain over several days are diagnostic.

The following from a report by Katrina Hedberg, MD, is illuminating.

> Among 43 team members participating in the varsity "immersion" football camp held the week 15 Aug 2010, 3 had triceps compartment syndrome, 5 others had rhabdomyolysis with CK > 23,200 U/L (100 times the upper limit of normal for WVMC laboratory), and 14 others had rhabdomyolysis with CK between 2,320 U/L (10 times the upper limit of normal) and 23,200 U/L. Of the 22 team members with triceps compartment syndrome and/or rhabdomyolysis, all had muscle-related symptoms referable to the upper arm, 12 were hospitalized, and none had kidney failure. CK testing at McMinnville High School identified 16 of the 22 cases.[22]
>
> Although the CK threshold for diagnosing rhabdomyolysis has been proposed as 5-10 times the upper limit of normal, conditioned athletes who have had CK measured post-exertion in a non-clinical setting can have very high CK values. In one study of college football players in preseason practice, the average CK was 5,125 U/L, 30 times the norm for men. *Id.*, p. 11 of 12.

18 Citations deleted, Hamilton, RW, et al., "Myoglobinuria, Hemoglobinuria, and Acute Renal Failure", Clin.Chem. 35/8, 1713-1720 (1989), p. 1715.

19 Bragdon, C., "Investigating Cases of Rhabdomyolysis: Following a March 2002 New York Police Academy Training Course", 9/30/02. http://www.slideshare.net/dangthanhtuan/36-investigating-cases-of-rhabdomyolysis

20 Hamilton, R.W., et al., "Myoglobinuria, Hemoglobinuria, and Acute Renal Failure", Clin.Chem. 35/8, 1713-1720 (1989), p. 1716.

21 Muldoon, S., P. Deuster, M. Voelkel, J. Capacchione, and R. Bunger, "Exertional Heat Illness, Exertional Rhabdomyolysis, and Malignant Hyperthermia: Is There a Link?", ACSM, Current Sports Medicine Reports, Abstract, March/April 2008 [Deuster, et al., (2008)], p. 75.

22 Hedberg, K., "Preliminary Report: Cluster of Compartment Syndrome and Rhabdomyolysis Among McMinnville High School Football Team", 9/2/10, pp. 8-10 of 12. http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CClQFjAA&url=http%3A%2F%2Fpublic.health.oregon.gov%2FDiseasesConditions%2FInjuryFatalityData%2FDocuments%2FOPHD_Football_Prelim_Report.pdf&ei=IR0-UM2xJ4aKrgGyo4GYAg&usg=AFQjCNG-x4Q8rAj3fKJm2ds-8rz98Cc4ow

Hedberg's normal level is a local level, established for the Willamette Valley Medical Center. Hospitalizations were for CK levels between 10 and 100 times the local normal, although in another study cited, the average for a number of football players post-exertion was 30 times the norm for men, whatever that might have been. With the release of myoglobin a concern arises for the pH of both blood and urine, and Robergs reports that only two to three minutes of intense exercise to exhaustion has been shown to decrease serum pH from 7.0 to 6.4,[23] just below the common threshold found in the literature for alkalinizing the patient's urine.

Efstratiadis, et al., provide an instructive diagram for the evolution of rhabdomyolysis into acute renal failure.[24] It illustrates the essential step of the breakdown of myoglobin by uric acid causing cast formations that restrict blood flow in the tubules of the kidney. The authors attribute the rise in uric acid to the release of nucleotides in the cells, which is a byproduct of ATP breakdown during anaerobic exercise, and their metabolism in the liver. The chart implicitly has two inputs to the disease–breakdown in muscles leading to myoglobin in the urine, and dehydration, which initiates constriction of blood vessels in the kidney and reduces pressures necessary for filtration. This model underscores the importance of maintaining good hydration for exercise, and including urinary pH as soon as any symptoms develop. Gardner suggests that individuals should maintain good hydration by keeping their urine color, volume, and density at normal levels. Gardner says one of the most important indicators of acute renal failure is "evidence of myoglobinuria", but he does not expound on that evidence, and never mentions darkened or colored urine.

Gardner's classification scheme, above, is unsymmetrical, and it does not satisfy those definitions of rhabdomyolysis linked to an unspecified degree of muscle damage, including his own.[25] In his scheme, mild EHI has no rhabdomyolysis, intermediated EHI includes mild rhabdomyolysis, and severe EHI includes severe rhabdomyolysis. His mild rhabdomyolysis can be either "asymptomatic elevation of serum skeletal muscle enzymes", or "symptomatic mild rhabdomyolysis". A better, symmetrical classification would be mild, intermediate, and severe rhabdomyolysis, where mild covers subclinical muscle damage, intermediate includes an instance of darkened urine, and severe is accompanied by symptoms of compartment syndrome or additional evidence of acute renal failure (ARF), as suggested by Gardner in his Exhibit 7-5, p. 246.

Nonetheless, the Textbooks on Military Medicine provide a simple diagnostic standard:

> Acute rhabdomyolysis is a condition that has historically been related to military recruit physical training. This injury syndrome is characterized by **myoglobinuria,** muscle pain, weakness, and soreness.[26]

However, no threshold for myoglobin exists to accept or reject a diagnosis of rhabdomyolysis because it is not reliable. The kidneys remove myoglobin too quickly.[27]

The inability of medicine to grade rhabdomyolysis in an individual, and to attribute it to the one hundred different causes, in no sense means the disease does not exist, nor does it lessen the importance of even vague symptoms of this disease that can lead to death. An individual can be in grave renal failure due to rhabdomyolysis and be relatively asymptomatic. Physical conditioning or PT is a screen for the considerable but unquantifiable number of individuals in the one and a half million active duty members of the armed forces who have one of the abundant causes of rhabdomyolysis. How many are caught in that screen with and without co-factors is today a statistical matter.

23 Robergs, R.A., F. Ghiasvand, D. Parker, "Biochemistry of exercise-induced metabolic acidosis", Am.J.Physiol.Regul.Integr.Comp.Physiol. 287: R502–R516, 2004, p. R505.

24 Efstratiadis (2007), *id*., p. 133, Figure 3, "Pathophysiology of ARF in rhabdomyolysis", referencing a 2005 paper by Singh, Chander, and Chopra behind the paywall.

25 §4.2.5, below.

26 Bold added, Vogel, J.A., and J.F. Patton, "Physical Fitness and Physical Training for Military Performance", TMM, Rehabilitation of the Injured Combatant, v. 2, (1999) Ch. 13. See Part IV, below, Vogel, Note 13.

27 Efstratiadis (2007), *id*., p. 134.

As surely as the disease is "difficult to impossible" to diagnose in its milder forms, it exists and it is associated with exertion. This is clear in famous clusters of cases—the hospitalization in 1971 of 40 Marines in a single platoon in Beaufort, SC,[28] the hospitalization of 10 out of 28 seasoned NYPD officers in a three-day academy plainclothes training course[29], the hospitalization of 22 out of 43 members of the McMinnville High School, Oregon, squad following a one-week immersion football camp.[30] Examination of these clusters reveals, or strongly suggests, that the co-factor 6, "sporadic, strenuous exercise"[31] is not just in play, but can be essential to the development of ER.

AFHSC reported 14 small clusters of exertional rhabdomyolysis in the military for 2005 through 2008.[32] The criterion was three or more cases within seven days. These clusters were not well defined, involving 4, 5, or 6 cases spread over a week. In a later MSMR, AFHSC provided a chart showing clusters of notifiable heat injuries from a single southeastern training installation for 2011, accompanied by the heat index in ºF.[33] The clusters were uncorrelated with temperature (R^2 = 1.3%), but the size of the clusters were immense. The top two clusters were 94 and 91 cases, and the next five numbered 76, 71, 68, 50, and 48. The number of reporting days was 19 out of 95, leaving in question whether the 76 days with no reports had no cases or no training. The data did not include the number of participants in the training, so the rate could not be determined, and it provided no breakdown in rhabdomyolysis, heat stroke, and other heat injuries. The clustering needs further investigation.

By design, CrossFit provides several defenses against exertional rhabdomyolysis. Its exercises are brief, lasting less than about 20 minutes. With normal hydration before the workout, dehydration has little chance of developing. CrossFit's exercises mix anaerobic and aerobic pathways, tending to neutralize metabolic acidosis over time, reducing the level of lactic acid. Anaerobic exercise tends to produce lactate, while aerobic exercise absorbs it. Each CrossFit workout is a prescription for loaded movements, not a standard for total work done or maximum power developed. In this way CrossFit workouts are individualized, each to stress the individual to perform not to an external standard, but gradually to improve his "personal best". Many gyms conduct CrossFit classes where athletes learn safe and productive movements with a common workout, but each develops no more work or power than that which will just stress his own capabilities. CrossFit workouts also individualize by encouraging athletes to modify workouts by adjusting loads or substituting movements to suit their capabilities. CrossFit is not susceptible to the overexertion caused by group training where all athletes are held to the same standard of work produced or power demonstrated. CrossFit teaches its trainers and those who would self-train to be alert to the hazards of the untrained or deconditioned athlete.

28 Demos, M.A., Gitin, E.L., "Acute Exertional Rhabdomyolysis", Arch.Intern.Med. February 1974;133(2):233-239, Abs.

29 Bragdon, C., "Investigating Cases of Rhabdomyolysis Following a March 2002 New York Police Academy Training Course", 9/30/02. http://www.slideshare.net/dangthanhtuan/36-investigating-cases-of-rhabdomyolysis

30 Hedberg (2010), above.

31 §4.4.6.2-6, below.

32 MSMR, Vol. 16-3, March 2009, p. 12.

33 MSMR, Vol. 18-10, October 2011, p. 19.

1.2. Military heat illness reports confuse rhabdomyolysis and heat stroke, but support a finding that war and not ECPs is the cause of an overstated rise in injuries.

The online Merck Manual for professionals presumes the reader is familiar with rhabdomyolysis, referencing it many times but providing no explicit definition. The Manual divides ***heat stroke*** into two variants, ***classic*** and ***exertional***, noting "some differences" in this table:

Table 2: Some Differences Between Classic and Exertional Heat stroke

Characteristic	Classic Heat stroke	Exertional Heat stroke
Onset	2 – 3 days [of exposure]	Hours
Patients usually affected	Elderly, sedentary people	Healthy active people (e.g., athletes, military recruits, factory workers)
Risk factors	No air-conditioning during summer heat waves	Intense exertion, particularly without acclimatization
Skin	Hot and dry	Often moist with sweat

Also, the Manual explains "rhabdomyolysis is common" in exertional heat stroke. The Merck Manual provides no guidelines by which a health care specialist might differentiate rhabdomyolysis with exertion from *exertional heat stroke*, a disease recognizable because it occurs among healthy, active people.

Merck does not rule out the possibility of a single risk factor being sufficient with minimal heat, a conclusion known by experience and confirmed in the data. A sufficiently intense exercise in a benign environment can induce rhabdomyolysis in anyone, but the intensity required is substantially reduced in hot and humid conditions. Military data on exertional rhabdomyolysis is sufficient to permit quantifying that amplifying effect of heat.

The Armed Forces Health Surveillance Center (AFHSC) publishes Medical Surveillance Monthly Reports (MSMRs), data on which the *Consensus Paper* relies. AFHSC began an annual series on "Heat-related Injuries, U.S. Armed Forces" in May, 2007 (Vol. 14-2), each report showing trends over the past five years. It began another series the next year on "Exertional rhabdomyolysis among U.S. military members" (Vol. 15-2), the first edition covering the previous four years, and thereafter each report covers five years. Until 2012 (Vol. 19-3), the MSMRs always referred to exertional rhabdomyolysis as *presumed*, explaining,

> For several reasons, the findings of this report are difficult to interpret. For example, because there was not a diagnostic code specific for "rhabdomyolysis" prior to 2004, a reliable record of past experience is not available for assessing recent experience. Because of the recency of implementation of a specific diagnostic code, it is difficult to determine if the increase in reported cases of "rhabdomyolysis" from 2004 through 2007 reflects increasing awareness and use of the code in standardized reporting, the continuation of a trend of increasing incidence, or a recent increase in case incidence. Also, the diagnosis of "rhabdomyolysis" does not indicate the cause; in turn, it is difficult to discern cases that are "exertional" and/or heat-related from those with other precipitating causes.

Still, the findings of this analysis are informative and potentially useful for prevention. They confirm that, in U.S. service members, most cases of exertional rhabdomyolysis occur in mid-to-late summer at basic combat/recruit training installations and at home bases of major Army and Marine Corps combat units. They also suggest that service members who represent black and "other" non-white race/ethnic groups have relatively increased risks of exertional rhabdomyolysis during military service.

Individuals who suddenly increase overall levels of physical activity and/or increase stress on weight bearing muscles – particularly in high heat and humidity – are at increased risk of exertional rhabdomyolysis. Recruits who are not physically fit when they begin training have relatively high risks of training-related (including exertional heat) injuries, in general. Also, recruits from relatively cool and dry climates may not be acclimated to the high heat and humidity at training camps in mid-late summer. Finally, soldiers and Marines in combat units often conduct rigorous unit physical training, personal fitness training, and field training exercises regardless of weather conditions. It is not surprising, therefore, that recruit camps and installations with large combat units account for most exertional rhabdomyolysis cases.[34]

Analysis of the logical combination of ICD codes used by AFHSC to distinguish exertional rhabdomyolysis from other heat injuries does not resolve the uncertainty in classification. For example, ICD-09 Code 992.0 is "Heat stroke and sunstroke", under which are codes 992.3-5 "heat exhaustion" and 992.9 "effect of heat and light". The latter two comprise AFHSC's "Other heat injury", and they overlap ICD-09 codes 992.0-992.9, sometimes termed "effects of heat", which are a conditional part of AFHSC's criteria for exertional rhabdomyolysis.

The contribution of exertional rhabdomyolysis is small within the spectrum of exertional heat injuries. See Figure 2. Therefore, a small misclassification of heat stroke or other heat injuries as exertional rhabdomyolysis has an exaggerated effect on the ER record.

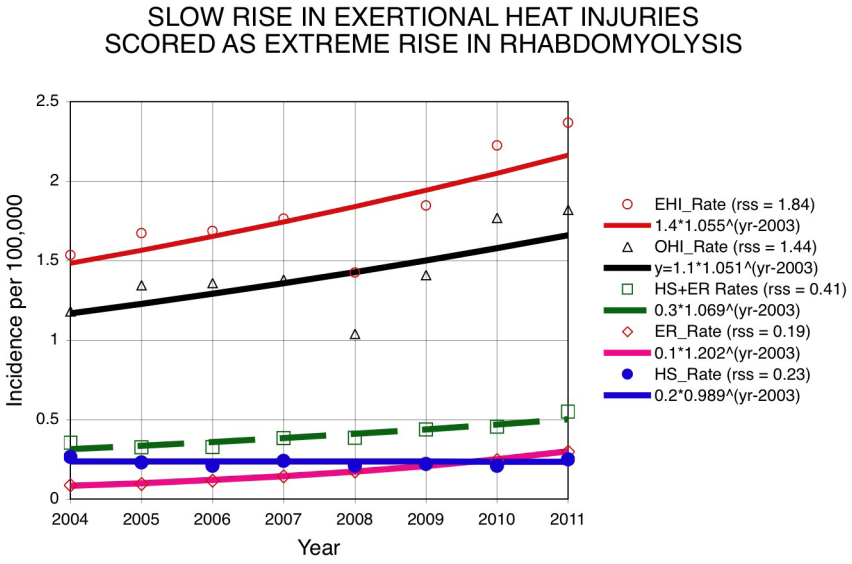

Figure 3
Exertional Heat Injury (EHI) rate, rising 5.5%/year, comprises a 5.1%/year rise in Other Heat Injuries (OHI), a 1.1%/year **decline** in Heat Stroke (HS), and a **20.2%/year rise** in Exertional Rhabdomyolysis (ER).

34 MSMR, Vol. 15-2, pp. 10-11.

Since the addition of the 2004 diagnostic code, exertional rhabdomyolysis has been rising at 20.2% per year, while the incidence of heat stroke has been in decline at 1.1% per year. Because they are "difficult or impossible to distinguish", the AFHSC fears that the ER increase "reflects increasing awareness and use of the [diagnostic] codes" has materialized.

AFHSC data show that the incidence of heat illness (HI) is greatest for the youngest, and decreases steadily with age. Figure 4, below. However, the AFHSC data have the properties that both the distribution by age group of cases and population are remarkably constant for empirical data. The distribution of cases is nearly constant year by year for the six years reported to date, 2006 to 2011. A mathematical model of the average of the cumulative number of EHI cases (HI + ER) over these years yields a model for the number of cases at every age:

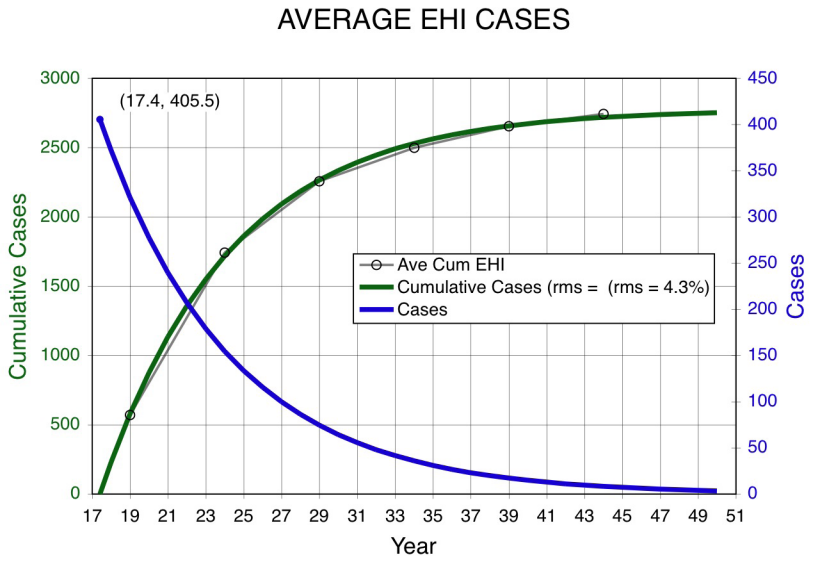

Figure 4
The smoothly increasing distribution (cumulative) of Exertional Heat Illness events is the result of a density that smoothly declines with age. The model is accurate without assuming other events, such as the acclimation of recruits.

The distribution at each age is well-modeled by the average of Figure 4 multiplied by a single scalar for each year. That factor shows that the number of EHI cases, representing the combination of increases in the incidence per capita of EHI plus the increase in population, has been increasing at 7.8% per year, as shown in Figure 5. The error in the representation of cases by a multiple of the average is 2.3% or less each year.

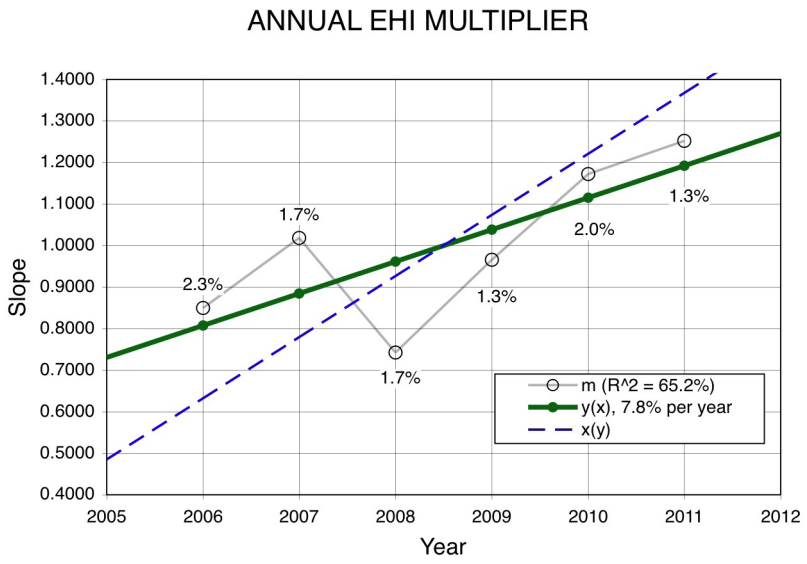

Figure 5
Cumulative Exertional Heat Illnesses is a distribution that has been rising at 7.8% per year.

The AFHSC data include the number of cases by various categories along with the incidence or rate per 1,000 person-years. The ratio of cases to incidence is an estimate of the number of individuals in each category. The population by age in the military has a distribution exhibiting a remarkably constant pattern from year to year, a pattern that slowly increases with age. This pattern is the result of a density that smoothly declines with age. Both the distribution and density with age are in Figure 6, below.

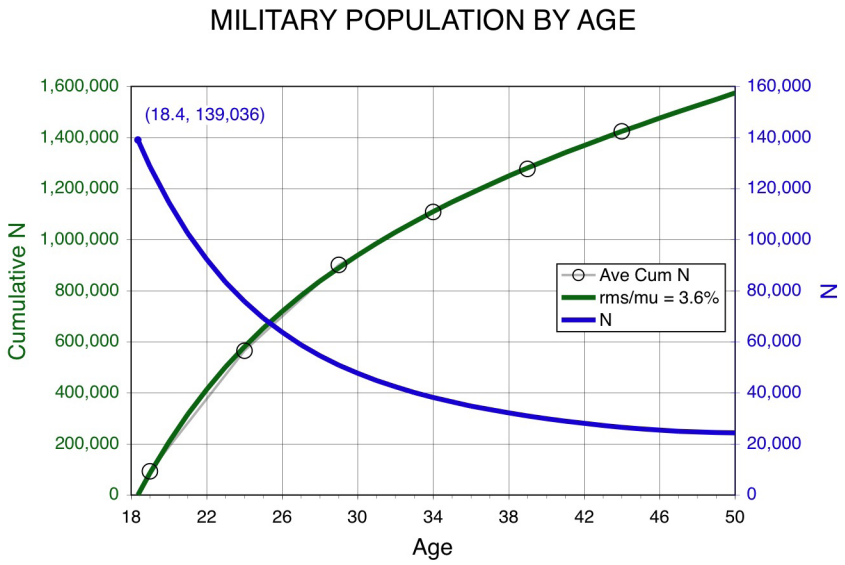

Figure 6
The distribution of the number of individuals in the military averaged over the six reporting years increases smoothly with age, yielding a smoothly declining population density with age.

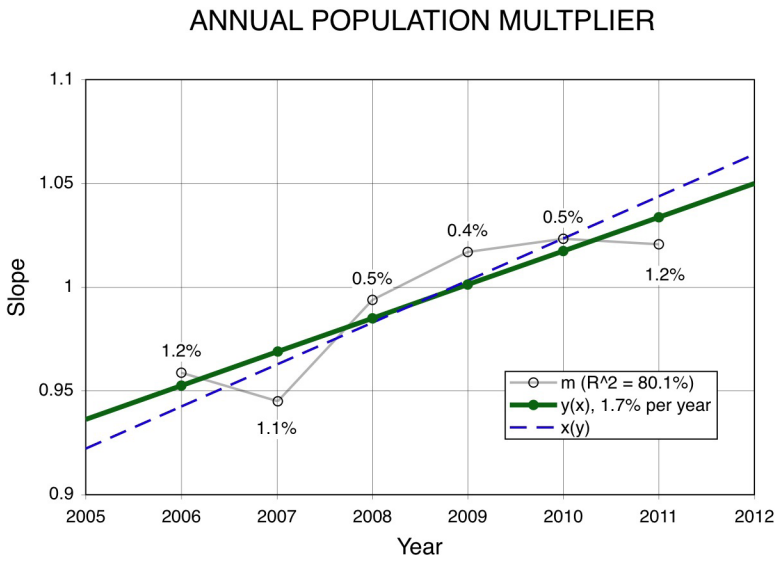

Figure 7
The population distribution each year has been a multiple of the average distribution over the years, accurate to within 1.2%, and increasing at 1.7% per year to add to the number of EHI cases. The rate of increase of EHI cases due to causes other than population growth is 6.1% per year.

The population distribution each year is the average over all years multiplied by a factor that increases every year. The reported rate of increase in military population is 1.7% per year.

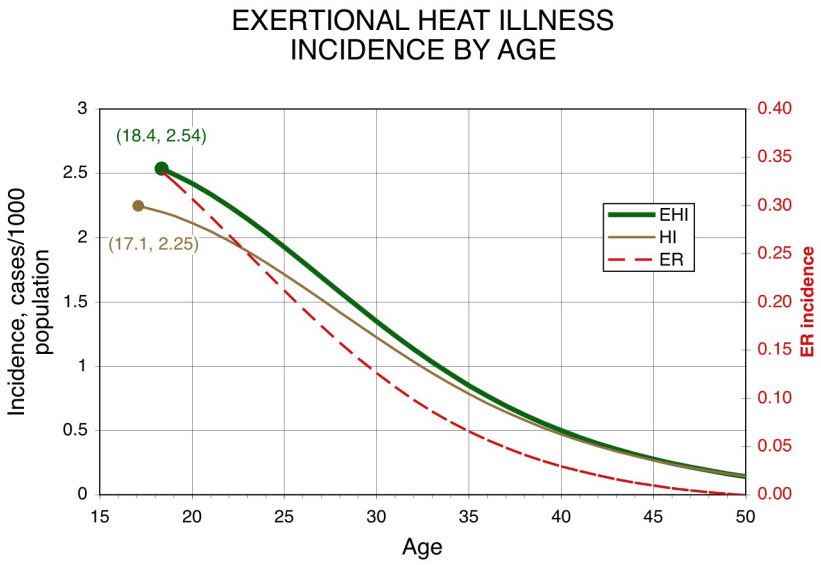

Figure 8
The incidence of both Exertional Heat Illness (EHI) and AFHSC's Heat Illness decrease smoothly with age, the difference attributable to Exertional Rhabdomyolysis (ER).

Combining the all-age models for both the number of cases and the total population yields a single model for the incidence of EHI per 1,000 individuals at every age. The ratio predicts that the vulnerability of individuals to exertional heat illness declines steadily with age from at least age 18.4 years to about 50 years of age. The reasons may be psychological, in particular learning to resist temptations to overexert. A corollary is the invulnerability of men around 19 years of age that makes them fearless warriors. The data need no other explanation peculiar to recruits.

1.2.1 Exertional rhabdomyolysis cases in the military are dominantly heat amplification of the effects of exertion.

AFHSC provided a seasonal chart for "presumed exertional rhabdomyolysis" for ambulatory visits and hospitalizations by month, totaled for the years 2004 through 2008 for all services.[35] The next figure contains the combined incidents from that report with a best-fit (least squares) estimate comprising a constant background rate as the base for a variable number of cases, seasonal effects represented by a cosine wave. The seasonal effect is obvious, but the curve fitting quantifies it. The record of presumed exertional rhabdomyolysis cases is 84.5% due to a seasonal effect, 11.1% from a constant background incidence, plus about 4.4% random effects that average zero.

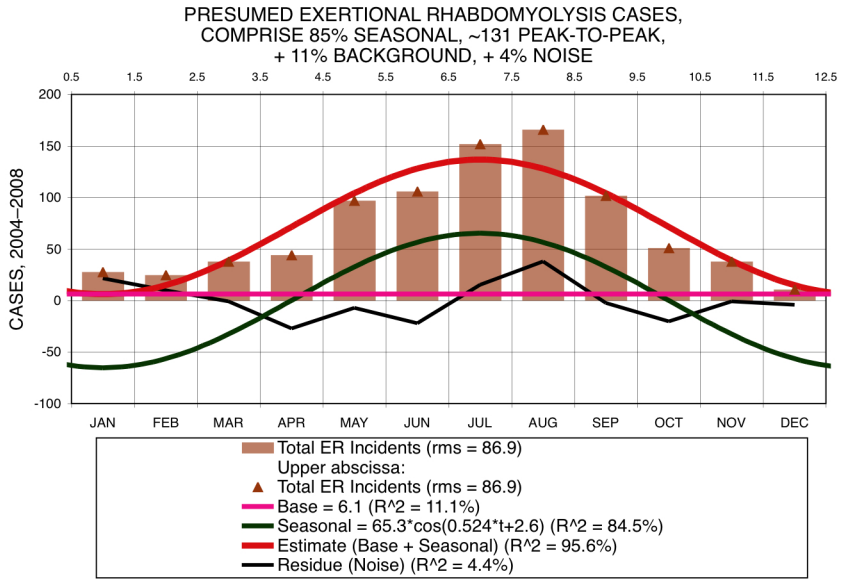

Figure 9
Exertional Rhabdomyolysis in military experience
is dominantly a heat effect.

One consequence of this seasonal dependence is that in the military experience, exertional rhabdomyolysis is as predictable as heat stroke from the total incidence of AFHSC heat injuries.

35 MSMR2009, v.16-3, figure 11, p. 22.

These four observations -- the broader category of Exertional Heat Illness (Gardner), the classification of Exertional Heat stroke in which rhabdomyolysis is a common symptom (Merck), the difficulty in differentiating between moderate heat illnesses (AFHSC), and that heat is the dominant cause of exertional rhabdomyolysis -- show that the separation of exertional heat illness into heat injury and exertional rhabdomyolysis is artificial. Furthermore, the division is misleading. These data contradict the conclusion co-authored by a CHAMP executive and *Consensus Paper* author, that

> ER [Exertional Rhabdomyolysis] [occurs] unrelated to heat and humidity after strenuous exercise.[36]

This article also says,

> Unlike EHI/EHS, ER occurs in both cool and warm environments. *Id.*, p. 77.

The claim that ER is unique cannot be shown from the AFHSC data, even though ER can be induced with certainty in any environment. However, the data show that in the military experience, the odds are eight to one against heat not being a cause. Moreover, as Deuster, et al, note, "the true incidence of ER is unknown". *Id.*, p 75.

Military data on exertional rhabdomyolysis do not support the *Paper*'s "potential emerging problem".

36 Muldoon, S., P. Deuster, M. Voelkel, J. Capacchione, and R. Bunger, "Exertional Heat Illness, Exertional Rhabdomyolysis, and Malignant Hyperthermia: Is There a Link?," ACSM, Current Sports Medicine Reports, Abstract, March/April 2008.

1.2.2 The War on Terror is a probable cause for observed increases in heat illness.

The second confounding problem is that the *Paper* generalizes from CrossFit to a half dozen competing conditioning programs. One, Gym Jones, is a compromised, CrossFit knock-off which has been recommended as preferable to CrossFit for the US Army Rangers PT program, Ranger Athlete Warrior (RAW).[37] The others are unrelated programs, together featuring body-building with non-functional exercises, infomercial selling of equipment and exercise routines, and club membership sales.

The *Consensus Paper* deduced that the growth in ECP programs caused an increase in training injuries, relying on the facts of a growth in CrossFit concurrent with a hypothetical increase in heat-related injuries. At best, this deduction rests on a fallacy: the assumption that correlation proves causation.

With no other information, an explanation for the data is that the failure of conventional physical training, manifest in slowly rising injury rates, has caused trainees in need of better conditioning to turn to CrossFit. Whether CrossFit increased training injuries or the reverse depends in part on whether the growth in CrossFit popularity leads or lags the injuries, respectively. The data available are too few and too coarse for a meaningful estimation of the underlying lead-lag relationship. A reasonable conclusion, supported by the observations, is that inadequacies in the conventional physical training regimen, manifest in slightly higher injury rates, is causing the training commands to turn away from traditional callisthenic/running programs to commercial conditioning programs, and to CrossFit in particular.

Yet a third possibility remains with respect to causality. Two phenomena may be correlated, with or without one in the lead, when each is an effect from a third phenomenon, a common cause. For example, any two seasonal effects selected at random, however distant on Earth, are correlated.

Another profound event, namely war, is a candidate cause for increased exertion in military conditioning and training. Between 2000 and 2005, the number of military deaths from all causes increased by 150%.

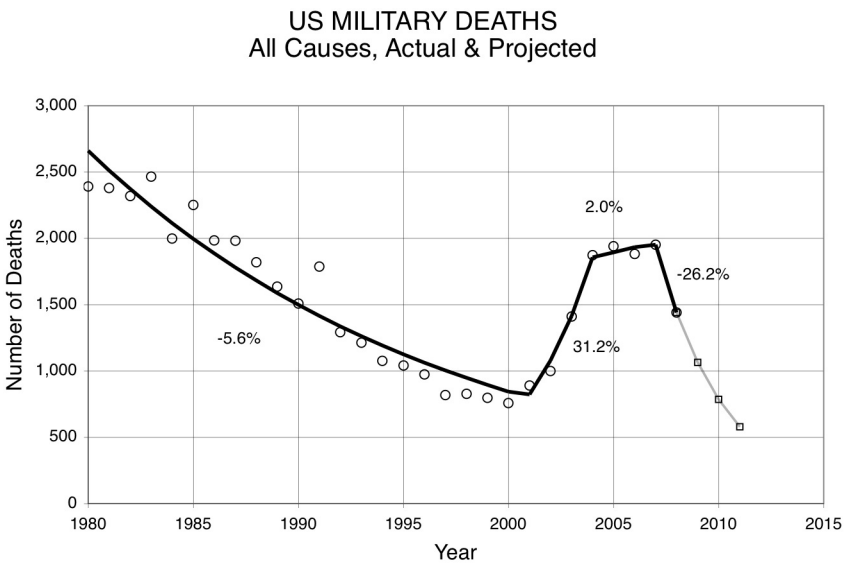

Figure 10
U.S. Active Duty Military Deaths, 1980–2008[38]

37 Anonymous, "Are CrossFit and Gym Jones compatible with RAW?", http://hprc-online.org/physical-fitness/files/are-x-fit-gymjones-compatible-with-raw . An HPRC article entitled "RAW Assessments" refers once to "… hybrid workouts from X-Fit, Gym Jones …" as equivalents. Ellipses in original, http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CEMQFjAA&url=http%3A%2F%2Fhprc-online.org%2Fphysical-fitness%2Ffiles%2Fraw-assessments-task-conditions-standards&ei=XQExUNaKNci-2gWty4HwBg&usg=AFQjCNH9LLlf60L5JAT-HLFHBkV-z3kU8g

38 Congressional Research Service, American War and Military Operations; Casualties: Lists and Statistics, 2/26/10, P. 7, Table 4.

For over 20 years, the period of eligibility for military retirement, US military deaths declined at 5.6% per year. Then with the attack on 9/11 and into the first three years of the War on Terror, military deaths soared at over 31% per year to remain elevated and rising at 2% per year for three more years.

Did this surge in casualties create a demand among recruits for better personal conditioning? Among drill instructors for more fit replacements? Among field medics for better survival rates? Among the services as a matter of policy? Does a more powerful incentive exist to train harder, to be better prepared?

At least the reverse conjecture, that what was good enough conditioning for peacetime is good enough for war, seems most improbable and contrary to history. If the war time conjecture is to be elevated to a hypothesis, the onset of war implicit in Figure 10, above, must be an event that reasonably leads the rise in military heat-related injuries. That criterion essential to raising the conjecture to a hypothesis is indeed satisfied, as shown in Figure 11 next.

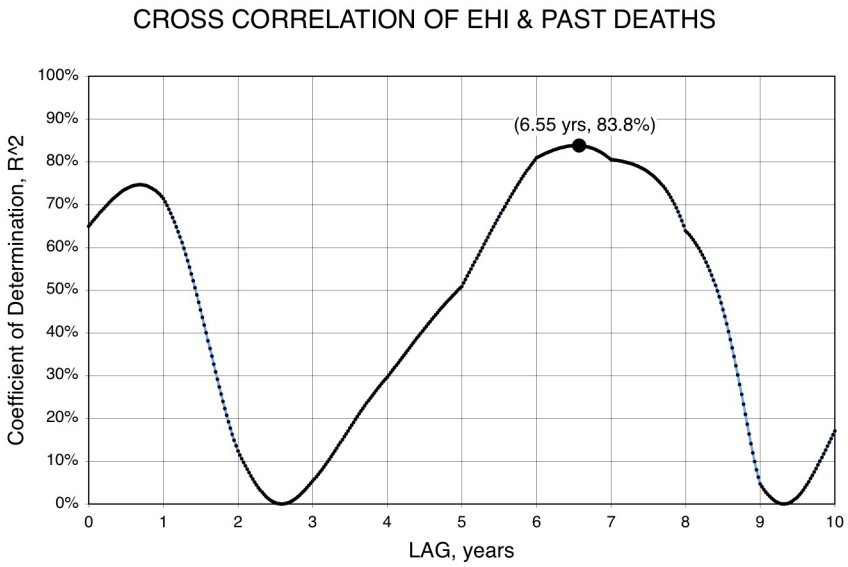

Figure 11
The cross-correlation function suggests Exertional Heat Injuries are responding strongly to the seven-year-old surge in military deaths from the War On Terror.

The surge in war casualties predicts 84% of the rise in training injuries with a lag of almost seven years.

Showing that one variable leads another is essential to the scientific investigation of causality, in which a model places the leading variable as the Cause and the lagging variable as Effect. The authors of the *Consensus Paper* speculated that the rise in ECP popularity was the cause of added injuries, but were unsuccessful for failing to establish that ECP popularity preceded the injuries. To the contrary, the War On Terror cannot be discounted as the cause of the increase in training and conditioning injuries, regardless of the number of cases involved in the increase.

1.2.3 How not to mistake correlation for Cause & Effect.

The CHAMP/ACSM authors, all credentialed scientists, are not alone in this failure to employ basic modeling precepts. Climatologists, for example, wrongly declared CO2 to be the cause of global warming, instead of the reverse: global warming (which is due to the Sun) causes CO2 to increase. This error stemmed from a failure ever to measure which leads which, or indeed that any of the dozens of relevant relationships in Earth's climate meet this essential criterion for establishing Cause & Effect. Further, the CO2 would have had to lead by eons because of the massive heat capacity of the ocean making it take on the order of a century to respond. Heat capacity is not included at all in their Global Climate (Circulation) Models.

An immediately applicable error in Cause & Effect is the association of lactic acid or lactate with acidosis, generally and incorrectly called lactic acidosis.[39] Robergs, et al, establish that

> metabolic acidosis is caused by an increased reliance on nonmitochondrial ATP turnover and not lactate production.[40]

They conclude that the concept of lactic acidosis is invalid. They also conclude that aerobic exercise, which they refer to as mitochondrial respiration, controls the balance of protons within the cells, counteracting acidosis from ATP hydrolysis during anaerobic exercise.

A Nobel prize went to Hill and Meyerhof in 1922 for their earlier work linking lactic acid production and acidosis.

> The unquestioned acceptance of a lactic acidosis is a hallmark of almost all of the basic and applied science research of muscle metabolism since the 1920s.[41]

Robergs, et al., show how investigators verified lactic acidosis by the strong correlation between declining muscle pH and increasing muscle lactate. Robergs also show how acidosis increases production of lactate.

> Thus lactate formation and efflux from working muscles is more a consequence than a cause of acidosis.[42]

The correlation was valid, but cause and effect have been reversed for 80 years. Robergs casts new light on CrossFit's three metabolic pathways, on the design of its workouts, and on implications for inducing rhabdo.

Because this deficiency in general science literacy is so commonplace, a couple of charts should help dispel the mystery in the simple but essential procedure of cross-correlation.

The classic problem is to analyze the relationship between two variables of a system, where each is observed only as it depends on yet a third, independent parameter, such as time, temperature, pressure, distance, mass, electric charge, and so on, singly or in combination, and without limit. The word parameter used in this sense has the same meaning as in the algebra of parametric equations. High school algebra includes the study of parametric equations, such as $x = \cos(t)$ and $y = \sin(t)$, which are the parametric form of a circle, $x^2 + y^2 = 1$. The cross-correlation process requires transforming a pair of numeric relations in coordinates (x,t) and (y,t) into a single statistical relation in the coordinates of (x,y), and while the process is numeric instead of algebraic, the process has a helpful graphical representation.

39 Robergs, et al, *id.*
40 *Id.*, p. R513.
41 *Id.*, p. R504.
42 *Id.*, p. R512.

Step one begins with assembling the relationships in their parametric form, as shown by the solid black circles in Figure 12. Next is to shift the candidate cause forward by an amount called the lag, conventionally designated by the Greek letter tau. To eliminate the independent parameter, the data samples often require adjusting to make them coincidental with respect to the independent parameter. The analyst does this by interpolation, often linear, but the method tolerates any form of interpolation, and is an art which affects the character of the cross-correlation curve but usually not the ultimate conclusion.

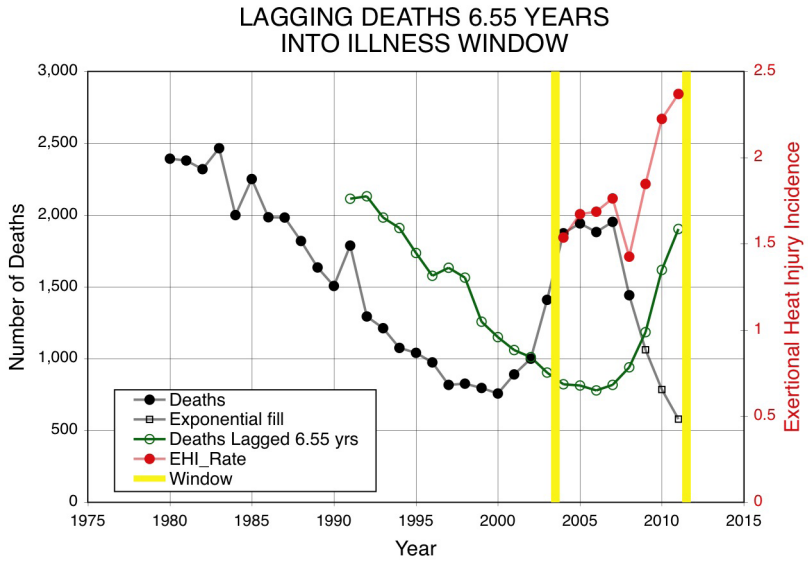

Figure 12
Parametric graphs of Exertional Heat Illness incidence (red), and original (black) and lagged (green) US Military Deaths, in preparation for cross multiplying in the window.

The curve in green in Figure 12 is the US Military Deaths record shifted by 6.55 years using two-point linear interpolation to integer years. Non-parametric data are now available as eight coincident pairs within the window of the shorter record. These coincident pairs are the hollow points in the next chart, Figure 13.

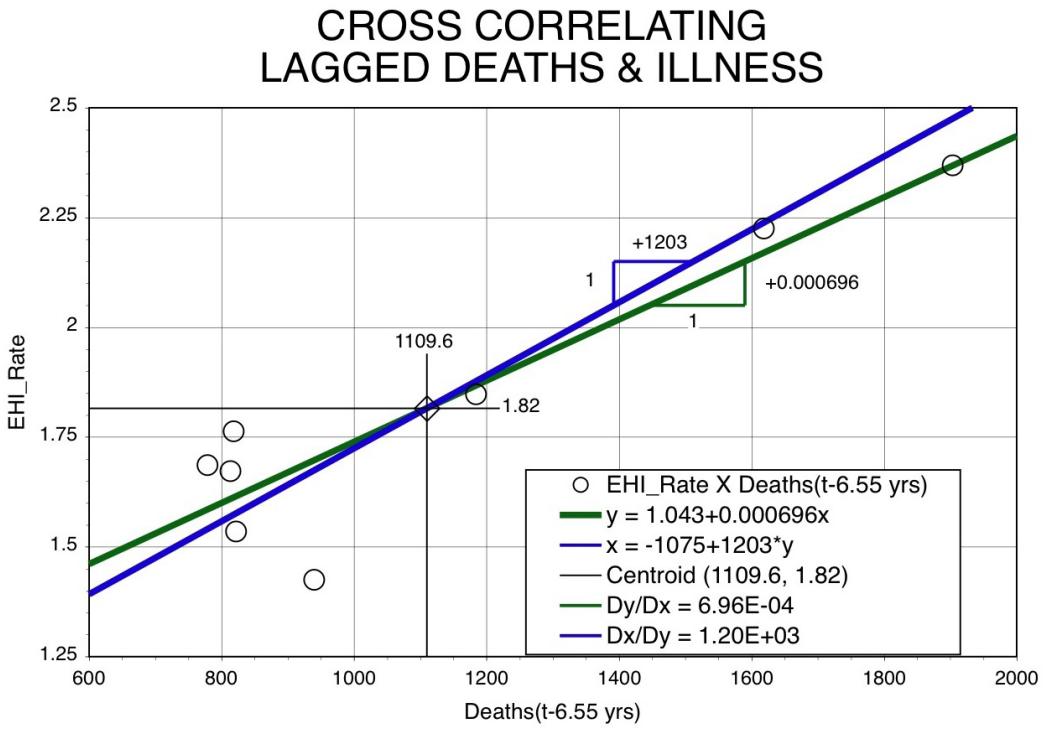

Figure 13
Coincident pairs of Exertional Heat Illness and lagged US Military Deaths
with linear regression lines that show that the two records are well-correlated,
but attributable to the two data pairs for 2010 and 2011.

This non-parametric chart–popularly though sometimes misleadingly called a scatter graph–often reveals algebraic relationships between the variables, and any randomness between them. The straight lines, called regression lines, are linear predictions of each variable created from the other. They cross at the averages. The product of their slopes, 1203*0.000696 = 83.8%, is the Coefficient of Determination, better known by its symbol, R^2, where R is the Correlation Coefficient, here for the lag of 6.55 years. The parameter R^2 shows how much of the energy represented in the record of one of the variables can be accounted for by a linear operation on the record of the other.

1.3. The Conclusions of the *Consensus Paper* must be rejected as unsupported and contradicted.

The *Consensus Paper* says of ECPs,

> The increasing acceptance is reinforced by widespread anecdotal reports of marked gains in physical fitness and performance. In addition, some Warfighters believe these programs contain functional training that directly translates into more effective performance on the battlefield. However, physicians and other primary care and rehabilitation providers have identified a potential emerging problem of disproportionate musculoskeletal injury risk, particularly for novice participants, associated with ECPs (13,16).[43]

The *Paper* makes no attempt to remove the anecdotal nature of these reports with data. Instead it asserts what "some Warfighters believe" only to caution against that belief with what it alleges is the work product of relevant medical practitioners without limit. In support, the *Paper* cites two inappropriate and irrelevant articles.

The *Consensus Paper*'s triply hypothecated "potential emerging problem associated with increasingly popularized extreme conditioning programs" in its first sentence has not materialized in either cause or effect. The *Paper* provides no evidence for the rate of "muscle strains, torn ligaments, [or] stress fractures". No evidence exists for musculoskeletal injuries, and the March AFHSC Reports of an epidemic in exertional rhabdomyolysis are likely erroneous for the reasons included by AFHSC. The *Paper*'s references cited in the sentence proclaiming a "potential emerging problem", references 4 and 27, provide no support for either assertion. For more detail, see Part III, below.

The reported rise in rhabdomyolysis is likely a categorizing error because it accompanies an improbable decline in heat stroke. The two are recognized in textbooks to be indistinguishable until they reach life-threatening stages, which are not among the data. The rate of increase of exertional rhabdomyolysis and heat stroke combined is 7% per year, within 1.5% of the rise in the rate of the parent class of exertional heat injuries.

The claims of the *Consensus Paper* must be rejected because the CHAMP and ACSM authors rely on anecdotal reports of exertional rhabdomyolysis, providing no data on the increase in popularity of ECPs. Nor do they provide any data on actual ECP participation in the military, much less a causal analysis showing from data that any increase leads the reported illnesses and alleged injury rates, as causality requires.

The *Paper* says,

> For many Warfighters, the demanding exercise pace, overall difficulty, and perceived potential for "getting ripped" are appealing, exciting, motivating, and appear to target a niche of otherwise unmet training needs and desires.

There is no voice for the Warfighters here. This image invoked of a beauty contest is denigration, not self-deprecation. What is exciting, or better energizing, is the prospect of being deployed for multiple tours in a combat zone where the probability of becoming a sudden casualty is disproportionately high. That risk is quantified, and like a cause, leads both the rise in exertional heat illness and in the popularity of, especially, CrossFit.

43 *Consensus Paper, id.,* p. 383.

PART 2

PART 2: THE *CONSENSUS PAPER* DISCLAIMS ITS OWN AUTHORITY

2.1. The *Consensus Paper* supports the conclusion that it is a mock interim consensus or final consensus of a mock conference.

Under the ambiguous subheading *Methods and Approach*, the subject *Consensus Paper* explicitly describes the consensus-seeking process of a

> collaborative workshop, composed of [CHAMP], other members of the [DoD], and representatives of [ACSM]

of September 13 and 14, 2010. The full title of the conference was

> HPRC & ACSM's *High Intensity Training Conference and Performance Optimization Workshop*, sponsored by Human Performance Resource Center [HPRC], September 13-14, 2010, Uniformed Services University for the Health Sciences [USU], Bethesda, MD.[1]

HPRC is a daughter organization in the education arm of CHAMP within USU, all three DoD organizations.[2]

The *Consensus Paper* cites no publications relating to the High Intensity Training Conference and Performance Optimization Workshop. The *Paper* has no references to the workshop agenda, to its invitees, presenters, or attendees, to its proceedings, or to any deliberations. It has no reference to any work product beyond an anonymous name change from High Intensity Training (HIT) to Extreme Conditioning Programs (ECPs).

However, HPRC discusses the conference in an article entitled "Are high-intensity training programs safe and effective"[3]. In another called "High Intensity Training PowerPoints", HPRC provides links to eight presentations from the conference[4]. Seven presentations from the conference are available for public viewing on scrib.com (find via "Uploaded by: cwolf88"), where they are downloadable for a fee.

1 http://www.scribd.com/doc/80586180/Hprc-5fhit-5ftemplate-2d1-5f1-5fwthompson
2 http://hprc-online.org/about-us/about-hprc#about-us
3 http://hprc-online.org/physical-fitness/hprc-articles/are-high-intensity-training-programs-safe-and-effective-2
4 http://hprc-online.org/physical-fitness/policys-and-standards-1#reports-1

#	Title	Access	Scribd
1	HIT Executive Summary	Public	Bergeron, et al., "CHAMP/ACSM Executive Summary: High-Intensity Training Workshop", 4/4/11 [EXEC SummaryECP Final][(a)]
2	Injury Prevention Considerations	Password	Bergeron, M.F. [HPRC_HIT_Bergeron-Injury Prevention] 2/6/12
3	Research Needs in HIT	Password	Bergeron, M.F. [HPRC_HIT_Bergeron-Research Needs in HIT] 2/6/12
4	HIT and Dietary Supplements	Password	Deuster, P.A., "Nutrition, Supplements, and [HIT] Programs" [100914 DEUSTER nutrition HITs.ppt (HIT Pad Final)] 2/6/12[(b)]
5	Guidance Development Presentation	Password	Thompson, W.R., "Guidelines Development" [Hprc5fhit5ftemplate2di5fi5fithompson], 2/6/12
6	High Repetition and Short Rest Intervals Exercise Training	Password	Triplett, N.T. & J.M. McBride, "High Repetition and Short Rest Interval Exercise Training (Circuit Training)" [Triplett Paper] 2/6/12.[(c)]
7	Baseline Fitness Requirements	Password	Zambraski, E.J. [HITEJZbaselinefitness] 2/6/12.[(d)]
8	Human Performance Optimization: An Evolving Charge to the Department of Defense	Public	O'Connor, F.G., P.A. Deuster, K.A. Henry, V.E. Martindale, L. Talbot, W. Jonas, & K. Friedl, ***Military Medicine***, 172, 11:1133, November, 2007[(e)]

(a) This Executive Summary is a 1,003 word extract from the 5,546 word *Consensus Paper.* The lists of authors are identical: Michael F. Bergeron, Bradley C. Nindl, Patricia A. Deuster, Neal Baumgartner, Shawn Kane, William J. Kraemer, Lisa R. Sexauer, Walter R. Thompson, and Francis G. O'Connor.

(b) Fakes a CrossFit affiliate advice to use "NO BS Dirty Recovery", a potentially dangerous product.

(c) Unaffiliated authors; unpublished, undated, and unpaginated paper.

(d) Claims CrossFit is "one size fits all" by extracting 237 words from CrossFit's 543-word guide "How to Start", omitting the CrossFit recommendation to use a professional trainer, ignoring CrossFit's three fitness categories for beginners, ignoring CrossFit's provisions for scaling, ignoring CrossFit's cautions to increase gradually, ignoring CrossFit's caution to master the movements before doing the workouts, and omitting CrossFit's free online help.

(e) "The MHS [Military Health System] has achieved unprecedented and dramatic results in combat casualty care: case fatality rates for combat injury during the Global War on Terror are roughly one-half that of Vietnam and one-third that of World War II." OCONNOR (2007) p. 1133

None of the websites of the organizations associated with the workshop contains any of the missing information on the workshop, though some of the HPRC pages closed to the public remain hidden. An extensive search for the missing data on the Internet proved unproductive beyond these presentations posted on scribd.com.

The *Consensus Paper* leaves the reader to infer that its *Methods and Approach* referred to objectives of the *Consensus*, and that the *Paper* was a product of the workshop. The *Paper* shows that it was either independent of the workshop, or that it was a planned extemporaneous document, intended to be incomplete, vague, and subjective. In the alternative, the description of the workshop in the *Consensus Paper* is consistent with the conclusion that the workshop was a sham.

2.1.1 Conference proceedings are missing.

The *HIT Executive Summary* is the authors' 20% condensation of their *Consensus Paper,* appearing to add only these three sentences of any substance:

> Thirdly, military leaders should be strongly advised to consider the rigor of a unit's daily occupational and operational training, combined with medical, external, and environmental risk factors. This will ensure that planning for physical readiness training does not conflict with other injury risk magnifying factors. For example, extensive military training and same-day exhaustive physical training or fitness testing should be avoided, as this increases risk and demands controls to overcome the effects. *Id.*, p. 1.

The evidence that *HIT Executive Summary* was written last is that it corrected some grammatical errors, such as unreferenced pronouns and split infinitives, and removed superfluous words and phrases from the *Consensus Paper.* The *HIT Executive Summary* claims to be a summary of the Conference only in its title, and it contains no references, excluding especially all the papers listed by HPRC as conference presentations. The *Consensus Paper* implies that it is a summary, and it alone provides information on the proceedings, which are critiqued next.

2.1.2 Critical discussions once initiated went no further.

> **Participants** discussed so-called high-intensity training (HIT) commercial programs, **began** a critical dialog on this important issue, developed **initial** consensus-based recommendations, and established research **objectives** to support **eventual** more comprehensive and definitive evidenced-based guidelines.[5]

The writer answered a "potential emerging problem" with a potential emerging conference. Some things started, vague things which had neither individuals responsible nor dates for completion, and which made no progress worth reporting.

5 Bold added, *Consensus Paper* p. 384.

2.1.3 The *Consensus Paper* may constitute the workshop's "initial consensus-based recommendations", an impromptu work of the nine authors.

> Participants … developed **initial consensus-based recommendations**. . . . Bold added, *id.*
>
> The opinions and assertions contained herein are the **private views of the authors** and are not to be construed as official or as reflecting the views of the U.S. Army, the U.S. Navy, U.S. Air Force, U.S. Marines, U.S. Coast Guard, or the Department of Defense. *Id.*, p. 388.

The *Consensus Paper* must encompass the "initial consensus-based recommendations" because it is the only known work product of the conference. Its exclusion of DoD means that it cannot be a policy document for USU, CHAMP, or HPRC, in rank order. The *Paper* says, "With regard to the individual Services, each one has its own program and guidelines (Table 1)" (p. 386), so it is also not policy for the services.

2.1.4 The "initial consensus-based" document was neither comprehensive, nor definitive, nor evidence–based.

> Participants … established research objectives to support **eventual more comprehensive and definitive evidenced-based** guidelines. Bold added, *id,* p. 384.

The authors imply they were satisfied with neither the comprehensiveness nor the evidentiary support for their work product.

2.1.5 Promised final guidelines are chimerical, eventualities to reduce injuries.

> These guidelines **would** serve to optimize the potential prescription and safe use of such program designs and reduce injury risk for those participating in these conditioning programs. Bold added, *id.*

The authors don't say that their guideline **will** do as they suggest. Their use of *would* suggests that the guidelines are not likely to ever exist, or that such a use would never materialize. The latter is evidently the case since no evidence exists for any significant increase in injuries, much less such an event connected to ECPs or CrossFit.

Equally important is that the authors are optimizing, as they say, for low risk training. Their objective should be the same as conditioning programs—preparation for operational tasks, not just for training. Conditioning is a process causing minor muscle damage that induces natural rebuilding, and greater muscle resistance to risk in the field. The authors should change their focus from training for training's sake, and instead seek an optimum balance between training injuries and injuries and survival in the field. A benign and safe training program has been the standard, but it has been rejected by Warfighters.

2.1.6 Missing from the conference by implication were representatives of the individual services, Warfighters, and subject matter experts other than the authors of the *Consensus Paper.*

The authors acknowledge that the DoD & ACSM workshop involved more than 50 professionals including not only speakers and the writing group but also experts and other guests from both the military and civilian sports medicine and training communities. *Id.*, p. 388.

Subject matter experts were assembled from the civilian sports medicine and research communities and joint representation from the Army, Navy, Air Force, Marines, and Coast Guard. *Id.*, p. 384.

With no list of attendees or records of the alleged discussions, these claims for breadth of representation cannot be validated. No evidence exists that a spokesperson for any Extreme Conditioning Program participated in any capacity.

2.1.7 Workshop discussions on producing a mere summary of the conference were inconclusive.

The workshop was structured into four primary topic blocks: definition of HIT, guidelines for safe implementation of HIT programs: part 1, guidelines for safe implementation of HIT programs: part 2, and future research considerations. During the subsequent and final session of the workshop, all speakers and other attendees participated in **discussions to determine a process** and select key writers to develop a summary paper on the topic for distribution and publication. Bold added, *id.*

The *Consensus Paper* could report no conclusions from the discussions, much less the actual production of a publication process or selection of its writers.

2.1.8 The sole accomplishment of the conference was to change the name High Intensity Training (HIT) in its title to Extreme Conditioning Programs (ECPs).

The "HIT" nomenclature was, by consensus, changed to "extreme conditioning programs" to more accurately describe the scope of conditioning programs being addressed. *Id.*

With nothing more to report, the *Paper* damns with faint praise.

2.2. While the authors have abundant official channels for their work product, they rely instead on unofficial channels.

Among the nine authors forming this consensus of joint CHAMP/ACSM policy are Col. Francis G. O'Connor, MD, and Patricia A. Deuster, PhD. They are the medical director and scientific director, respectively, of CHAMP, a subdivision of the Uniformed Services University of the Health Sciences [USU]. Title 10, USC, Chapter 104.

CHAMP directors command channels for the dissemination of official information. See, for example, O'Connor and Deuster, "Where We Have Been", Memorandum for CHAMP members, partners, and friends, undated.[6] The Memorandum shows that CHAMP has a procedure by which the Directors might issue an official statement of policy. That Memorandum also announced the development of a CHAMP website, yet another official DoD outlet for health information.[7]

HPRC, sponsor of the HIT Conference, is organized under CHAMP. It is an official channel to disseminate health and fitness information to Warfighters and their families:

> The Human Performance Resource Center (HPRC) is a DoD initiative under the Force Health Protection and Readiness Program. The HPRC serves as an educational clearinghouse that focuses on Human Performance Optimization. The Human Performance Resource Center (HPRC) collects, organizes, and disseminates the most current information available on all aspects of human performance. The focus is to gather, organize, categorize, and summarize actionable information related to the maintenance, optimization, and enhancement of human performance, in training and on the battlefield.[8]

HPRC is a broadband channel to speak to Warfighters, but appears to have neither authority nor mechanism to speak for Warfighters. It hosts an HPRC Forum on Twitter, inviting comments, but as of this writing none exists.

In addition, the Armed Forces Health Surveillance Center (AFHSC) has DoD-wide responsibility for collecting and disseminating "health surveillance data for both DoD and external analysts and researchers." DoD[9]. In this capacity, AFHSC publishes its Medical Surveillance Monthly Report (MSMR), which includes unrefereed analyses and data on exercise, information on which the *Consensus Paper* relies as its Reference 4.[10]

The availability of these channels and the responsibilities of CHAMP draw into question the authors' election to publish a statement of the authors' private views under the auspices of, and copyrighted by, ACSM. The *Consensus Paper* is a joint policy statement with ACSM, a private corporation, suggesting an arrangement between CHAMP and ACSM. It was printed by ACSM in its *Current Sports Medicine Reports*, an unrefereed journal. See AFHSC, Author Instructions. The *Consensus* values "peer-reviewed literature" (p. 384), an anonymous, gate-keeping imperative in academia reflected in neither DoD nor much of industry.

The disclaimer stating that the *Consensus Paper* (p. 388) reflects "opinions and assertions of the authors [that] are not to be construed as official or reflecting the views of [any of the services or DoD]" contradicts the title of the article, its pedigree, and any authority for its recommendations and conclusions.

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6 http://www.usuhs.mil/mem/CHAMPdirletter.pdf

7 http://www.usuhs.mil/mem/champ.html

8 http://csf.army.mil/links.html

9 Directive 6490.02E, 2/8/12

10 Armed Forces Health Surveillance Center, "Update: exertional rhabdomyolysis among U.S. military members, 2009", MSMR 2010; 17:9–11.

2.3. ACSM has a dog in the fight.

Founded in 1954, The American College of Sports Medicine enjoys a reputation as a respected organization. Its mission statement reads,

> ACSM promotes and integrates scientific research, education and practical applications of sports medicine and exercise science to maintain and enhance physical performance, fitness, health and quality of life.[11]

The subject article, though, fails to meet the most elementary requirements for science or for objectivity, pretending to represent ACSM policy on ECPs with "the private views of the authors".

In its official capacity, ACSM included CrossFit in two different sessions at its recent ACSM Health and Fitness Summit, March 27–30, 2012, which

> gives students, fitness enthusiasts, personal trainers, certified professionals, and others the full spectrum of programming from scientific to practical application.[12]

Only outlines of the sessions are publicly available, accessible from an online list.[13] Both sessions were scheduled for March 29, 4:30 pm-6:00 pm and in different rooms, even though both related to trends in the modern fitness business.

2.3.1 Helen Vanderburg, ACSM spokesperson and counterfeit CrossFit trainer, addressed the ACSM Summit on "How To Make the Most Of Top Global Fitness Trends in your Business".

Vanderburg appeared to speak from personal experience. Her outline mentions CrossFit as follows: "Specialty facilities (Personal training, Indoor cycling, Pilates, TRX, Total Gym, Fusion, CrossFit . . .)", ellipsis in original.

> Staying current with the changes in the fitness industry is critical to the success of your business. In this session you will learn the top trends in the fitness industry and explore how these trends will impact you and your business. Learn how to evaluate the trends and determine ways to make these trends work for you to grow your business or fitness career.[14]

A little search of Vanderburg's writings shows clearly how CrossFit met her concept of fitness and her own business, which includes owner of Heavens Elevated Fitness Club, aka Heavens Fitness, in Calgary, CA.[15] Vanderburg speaks for ACSM, though without the initials after her name. She offers a course on "Extreme Interval Training–CEC Course" that gives ASCM Continuing Education Course credits. She also appeared as a panelist in the March Summit in a Student Session, which included "Ways ACSM is looking to serve you".[16]

11 http://www.acsm.org/about-acsm/who-we-are
12 http://www.acsm.org/attend-a-meeting/other-meetings/2011/09/17/acsm%27s-health-fitness-summit-exposition
13 http://forms.acsm.org/_frm/Summit2012/12HFSESyllabusPage.htm
14 Vanderburg session outline.
15 http://heavensfitness.com/personal_training.html
16 http://forms.acsm.org/_frm/Summit2012/pdfs/31%20Vanderburg.pdf

Vanderburg is a fitness columnist for the Calgary Herald. She is rather ecstatic about CrossFit, writing

> CrossFit is exactly that: crossing various exercises to maximize one's workout. …
>
> The CrossFit program is based on exercises and techniques an Olympic athlete would use–but the workouts are designed for all fitness enthusiasts. [¶] The exercises stay the same for everyone, but the intensity varies, depending on the individual. …
>
> If you are looking to improve both physical and mental toughness, you will like the CrossFit program. CrossFit can also be used for general physical preparation for most sports or as a sport itself.[17]

But continuing, she wandered into different territory. In context, she wrote

> The CrossFit prescription is "constantly varied, high-intensity, functional movement." [¶] Some workouts are more strength-based, while others have a higher cardiovascular challenge, so the sweat factor will vary, but the intensity is always high.[¶] The general training philosophy is to train hard and fast. **The class format is** 60 minutes in length and begins with a 15-minute warm-up, followed by 15 to 25 minutes working on a technical component. This sometimes introduces a new movement or improves efficiency in an existing movement. [¶] The **rest of the time is spent on the workout of the day.** … [¶] **Dress for a serious workout. Wear comfortable clothes that absorb sweat, as you will work hard. Fitness shoes are required.** Bold added, *id.*

Vanderburg is describing a particular class format and dress, which CrossFit does not prescribe. CrossFit prescribes workouts for individuals, and conducts corporate and affiliate training under whatever format suits the trainer. Vanderburg raises the suspicion that Heavens Fitness offers its version of CrossFit training.

Vanderburg is a highly honored, former world-champion synchronized swimmer, and clearly a CrossFit enthusiast. She has owned Heavens Fitness for over 25 years.[18] One of her trainers is

> J-me Hannay, MKin., BKin., BA (Distinction), NAIT PFT (Honours), CrossFit [sic], Kettlebell Certified; Specialty: Biomechanics, Bodybuilding, Kettlebell Training, Plyometrics.[19]

CrossFit records show Hannay holds a CrossFit Level 1 certificate. More importantly Heavens Fitness trainers include

> Erin Watts, GENERAL MANAGER; CrossFit [sic], AFLCA, TRX, Kettlebell Instructor; Specialty: Metabolic Training, **Cross Fit** [sic] & Olympic Weightlifting. Bold added. *Id.*

CrossFit records do not show that either Watts or Vanderburg holds a certificate, nor that Heavens Fitness is a CrossFit affiliate, necessary for Vanderburg to claim that she is teaching CrossFit.

17 Vanderburg, H., Multiply fitness results by keeping workouts random, Calgary Herald, 6/10/2009 http://www.calgaryherald.com/health/Multiply%20fitness%20results%20keeping%20workouts%20random/1675498/story.html

18 http://www.helenvanderburg.com/index.html

19 Bold added. http://heavensfitness.com/trainer_profiles.html

2.3.2 Nora Constantino, PhD, FACSM, with Associate Professor and UNR recreation Director James Fitzsimmons, EdD, both CrossFit Games competitors and operators of CrossFit UNR, addressed the Summit on "CrossFit: Menace To Society Or Future Of The Fitness Industry?"

Nora Lucile Constantino is an Associate Professor in the School of Community Health Sciences, University of Nevada, Reno. She is an exercise physiologist and specialist in endocrinology. CrossFit records show a 50-year-old Nora Constantino competing in the annual CrossFit competition, having completed all five 2012 Reebok CrossFit Games Open workouts as a member of University of Nevada CrossFit (UNR CF) team.[20] That is a remarkable accomplishment even for a youngster.

Co-author James A, Fitzsimmons is Director, Campus Recreation and Wellness, in the Lombardi Recreation Center, UNR. CrossFit records show 45-year-old Fitzsimmons completing the five Open workouts, scoring eighth and ninth overall in two of the events.

Thus presenters responsible for the edgy alternative in the title are experienced CrossFit enthusiasts as well as qualified spokespersons for the ACSM! This casts a special light on their forked headline.

Academics find that to be published, their writings must be overtly obedient to the dogma of the day, and deferent to the papers of its priests published in sanctioned, peer-reviewed, professional journals. Constantino's headline to her session might foretell a defense of ACSM's model of fitness against an evil uprising, a Fitness Spring to be castigated and excommunicated. In this interpretation, CrossFit is a menace to society, and it is epidemic.[21]

But in light of the authors personal athletic achievements with CrossFit, the headline is a provocative teaser for a nonconforming article. A clinical parsing of the outline to her session can reinforce the promise that her article works to dispel the notion that CrossFit is harmful, and anything but the revolutionary paradigm for fitness and conditioning. Clicking on her session title on the Syllabus Page brings up the outline.[22]

Constantino and Fitzsimmons kindly provided a copy of their 34-slide PowerPoint presentation as background for this critique. The slides contain bullet reminders for the presenter, but no text. One chart, however, did provide a useful datum: UNR CrossFit has records of 87,000 supervised workouts, with only one injury, and that was a strained ligament that had been surgically repaired just 36 months earlier.

20 http://games.CrossFit .com/athlete/33170 ; http://unrCrossFit .typepad.com/

21 "CrossFit: Menace To Society Or Future Of The Fitness Industry?" Nora Constantino, Ph.D.; James Fitzsimmons, M.S. http://forms.acsm.org/_frm/Summit2012/12HFSESyllabusPage.htm

22 http://forms.acsm.org/_frm/Summit2012/pdfs/73%20Constantino.pdf

2.4. The *Consensus Paper* relies on inaccessible and unofficial citations.

In support of two key points about alleged ECP risk, the ***Consensus*** authors rely on three papers by one or both of the Directors, published by ACSM behind a paywall. Refs. (19-21). The first citation is in this sentence:

> Other notable **clinical conditions that potentially increase the risks of ECPs** include, for example, cardiovascular disease (including hypertension) (23), a recent bout of exertional heat illness (i.e., heat exhaustion and exertional muscle cramps or heat stroke) (20), or a previous episode of exertional rhabdomyolysis (19).[23]

The second citation is in the following pair of sentences:

> Therefore, practical solutions **to effectively improve ECP implementation and reduce injury risk** are of paramount importance. This can begin with better functional and fitness screening and stratification for injury risk for all Warfighters prior to participation in any ECP (21).[24]

Being written by the same authors citing them, these references on their face have no value to support the claims. Because the authors neither quoted from these references, nor made them freely available to the public, the suggestions in *Consensus Paper* of increased risk associated with the ECMs remains unsupported. Regardless, for the purposes of DoD, the information is problematic because it was not published under the authority of DoD's clearing house, AFHSC.

2.5. The *Consensus Paper* characterization of conditioning programs is exclusively subjective.

The article says in its Introduction,

> **Extreme conditioning** programs (ECPs; e.g., CrossFit, Insanity, Gym Jones™, and others) are characterized by **high-volume aggressive** training workouts that use a variety of **high–intensity** exercises and often timed **maximal** number of repetitions with **short rest periods** between sets.[25]

If the *Consensus Paper* had been a scientific paper, professional practices would have required a verbal scheme of classification based on measurements to support each adjective in bold. For example, Medical Director O'Connor himself in "How to Write an Exercise Prescription" recently classified physical activity in six categories, from *Very light* to *Maximal*, according to relative numerical scales of VO2max and Maximal heart rate achieved within 60 minutes of exercise.[26]

Medical Director O'Connor did not follow his own prescription.

Not only does the article not provide any classification scheme, but it reports no quantified parameter by which to deem the targeted conditioning programs, classified as ECPs, as extreme or to rank them scored against what the article calls the "scientifically based training guidelines" embodied in the "other conditioning programs already in place." P. 385.

Science, by contrast, demands objectivity, verifiable facts in support of the reasonable Cause & Effect relationships of causation and causality. That is true notwithstanding the complete absence of Cause & Effect in the US Supreme Court's determination of five criteria for what constitutes scientific knowledge in Popper's post-modern world.[27] In an obvious contradiction to its own title, this article contains only "opinions and assertions". P. 388. Part 4, below, contains relevant and authoritative extracts from military textbooks maintained and disseminated by the U.S. Army for background in analyzing the claims in the *Consensus Paper.*

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23 Bold added, *Consensus Paper,* p. 385.

24 Bold added, *id.,* p. 387.

25 Bold added, *Consensus Paper* p. 383.

26 Gauer, RL and F. G. O'Connor, "How to Write an Exercise Prescription", USU, Department of Family Medicine, 4/22/12, Table 16, p. 43.

27 *Daubert v. Merrell Dow,* 509 U.S. 579, 1993.

2.5.1 Edward Zambraski, PhD, FACSM, misrepresents CrossFit.

The 7th Conference paper from the table is "Baseline Fitness Requirements". The presenter is Edward J. Zambraski, PhD, FACSM, Division Chief, Military Performance Division, US Army Research Institute of Environmental Medicine (USARIEM), Natick, MA. First on his agenda is

> What specifically do these commercial companies (e.g. CrossFit) say about baseline or minimal fitness requirements? *Id.*, Chart 2.

Chart 3 is "Options Offered by CrossFit.com Regarding Program Implementation". It is 237 of 543 words from CrossFit's "How to Start".[28] Zambraski added nothing, but here is what he deleted:

> We offer two paths for someone new to the CrossFit methods:
>
> 1. Work out on your own or
>
> 2. Go to one of our growing number of licensed CrossFit affiliates worldwide.
>
> For the person who endeavors to take on CrossFit without the guidance of a certified CrossFit trainer, we recommend three distinct approaches, depending on your fitness experience and available facilities:

What Zambraski deleted is that the remainder of his citation is a guideline for those who chose to workout on their own. He altogether lost the sense that the guideline is gradated in three degrees of skill. And he omitted the underlined hot link to CrossFit 's affiliate locator page.

Zambraski omitted the following sentences from the requirement and instruction for the most qualified do-it-yourselfers:

> If you've had exposure to Olympic weightlifting, powerlifting, and gymnastics, jump right in. If an exercise is unfamiliar, acquaint yourself with the movement through the video clip for the movement on the exercises section of the site.

He omitted that CrossFit teaches the beginner to become familiar with the movements before starting an unfamiliar exercise, and that it provides online video instructions for both movements and exercises.

Zambraski omitted the following resource for those in the middle zone of skills:

> We are developing a Substitution Chart in the FAQ for replacing exercises for which you've not developed the skills or don't have the equipment.

He omitted that CrossFit provides graded exercises to develop skills incrementally.

28 http://www.CrossFit.com/cf-info/start-how.html

Zambraski deleted the following ultimate advice for the least-skilled beginner who is going to self-train:

> ***This is a great place to begin for anyone with little or no experience with serious weightlifting or gymnastics.***

He omitted CrossFit's ***strongly emphasized*** alternative characterization of where a self-trainee should begin.

Zambraski deleted the following advice and resource for the self-trainee to set up his own gym:

> We are a "minimalist program" and this is reflected by the functionality and limited number of our exercises and the simplicity of the equipment we use compared to most commercial gyms. An Olympic weight set and a place to do pull-ups and dips is essential to doing CrossFit . Gymnastics rings and parallettes, plyometrics boxes, a Dynamax medicine ball, dumbbells, kettlebells, climbing rope, Concept II Rower, and a glute-ham developer will equip your garage with more than enough to follow the WOD very closely. (See CrossFit Journal, September 2002, "The Garage Gym" for information on building a world-class strength and conditioning facility in your garage.)

Including this paragraph would have tipped his hand that he was converting instructions for self-trainees into a recipe for a CrossFit of his own making. He removed the emphasis on developing movements before loading them for exercise. He removed the tailoring of workouts for the skill level of the trainee. He removed the graded exercises by which a trainee develops full skills.

"How to Start" explains that CrossFit workouts are world class, to be completed "comfortably and consistently". This statement was bracketed with these phrases:

> In any case it **must** be understood that the [. . .] before "throwing" yourself at them 100%. Bold in original.

Zambraski deleted strongly worded warnings for the self-training newbie to create a false, out-of-context confession that CrossFit contains only extreme workouts.

Finally, Zambraski deleted this resource and invitation to use it:

> The Message Board is a great place to find technical help, clear up confusions, or receive words of encouragement. One regular commented that hanging out on the message board for a week was more instructive than struggling with the WOD for a year. Don't be shy!

Zambraski deleted that CrossFit provides the self-training individual help at his fingertips.

In Zambraski's final chart, the Summary, he begins:

> There is an apparent lack of concern about those entering these programs who may have a low level of fitness, strength, and/or other risk factors. "One size fits all."

It was Zambraski who intentionally deleted CrossFit 's tailoring and scaling to individual skill levels and abilities. The residue of his concoction he presented as a false characterization of the CrossFit program.

To the extent that any "disproportionate injury" exists, it is the product of the traditional military training, a "one size fits all" program championed by ACSM, a regimented military program with tailoring to the individual relegated to a remedial program out of the mainstream for the nonconforming.

Zambraski discovered "How to Start" on the Internet at CrossFit .com. If he had searched a little further he might have found CrossFit Kids at CrossFit kids.com, CrossFit Longevity at CrossFit longevity.wordpress.com, or No Excuses CrossFit at noexcusesCrossFit .com. These are affiliates especially dedicated to bringing CrossFit conditioning to children, the elderly, and the handicapped. No one could deem CrossFit to be "one size fits all" having seen the images of Kyle Maynard and some of his clients at No Excuses CrossFit . See Kyle Maynard at Google Images.

✦

PART 3

PART 3: BENEATH THE SURFACE OF THE *CONSENSUS PAPER*

3.1. The CHAMP consensus overlooked the military's extensive adaptation of CrossFit, its principles, and the objective studies into its efficacy by the US Army.

> These recently **well-marketed** and popularized metabolically and physically demanding conditioning programs [ECPs] continue to generate **growing interest** and enthusiastic support among military and some civilian communities. The increasing acceptance is reinforced by widespread **anecdotal reports** of marked gains in physical fitness and performance. In addition, some **Warfighters** believe these programs contain functional training that directly translates into more effective performance on the battlefield.[1]
>
> CrossFit has gained immense popularity among military and law enforcement personnel; it has replaced or is used to augment traditional military physical training in many units. The U.S. Army conducted a recent CrossFit study wherein 14 men and women received initial and post-study physical assessments of their ability to perform a variety of functional movements. They then participated in CrossFit training for six weeks. Although most participants increased their power output and work capacity, the methodology of this study was weak: small sample size, no comparison training method or control group, and no injury or adverse data. Importantly, the results were not peer reviewed or published in the open scientific literature.
>
> The issue of injury remains unresolved. There are no reliable published data on CrossFit-related injuries and no comparisons of injury rates with other demanding physical sports such as running and basketball, which are leading sources of military training injuries. HPRC, CrossFit.[2]

HPRC articles are not peer-reviewed, and many are not available to the public. For example, HPRC says "High Intensity Training (HIT) conference presentations are now available on our website. … Click here to access the presentations."[3] Clicking there provides eight links to "High Intensity Training PowerPoints".[4] The first and last are publicly accessible, the remaining six papers are password protected, but have been otherwise posted on scribd.com.

HPRC provides a link to its two paragraphs quoted above under the heading "HPRC's Answer: High-intensity training programs."[5] While HPRC minimizes the Army CrossFit study, it nevertheless confirms that the study is the best available.

1 Bold added, *Consensus Paper* p. 383.
2 http://hprc-online.org/physical-fitness/hprc-articles/is-CrossFit -effective-for-warfighters
3 http://hprc-online.org/blog/high-intensity-training-hit-conference-presentations
4 http://hprc-online.org/physical-fitness/policys-and-standards-1#reports-1
5 http://hprc-online.org/search?SearchableText=HIT

3.1.1 The USMC Has Adapted CrossFit as the Corps standard.

Following a two-year study, the Marine Corps adopted a new conditioning program for all Marines. See "An Evaluation of a Combat Conditioning Trial Program [CCTP]"[6] and Marine Corps Order MCO 6100.13[7]. The *Consensus Paper* cites the latter, stating

> Provides policy and procedural guidance for implementing the Marine Corps Physical Fitness Program, including both combat and physical fitness.[8]

The USMC Program comprises four sections: 1. Combat Conditioning Program (CCP); 2. Physical Fitness Test (PFT); 3. Combat Fitness Test (CFT), and 4. Remedial Conditioning Program (RCP). The role of CrossFit is principally in Section 1.

The study program concluded

> Proper alignment of physical training practices with operational requirements is an ongoing concern for the U.S. Marine Corps. This alignment is being revisited in light of recent combat experiences. Greater emphasis on core strength and power are believed to be needed. **A program designed specifically to develop these areas of capability** was compared with usual conditioning practices. The Combat Conditioning Trial Program (CCTP) produced gains in core strength and power as intended, with no loss of cardiorespiratory fitness or upper body strength and power. The usual combat conditioning program did produce greater gains in cardiorespiratory fitness, but this trend may have been the result of relatively poor fitness when the study began. The CCTP produced a trend toward lower injury rates. The CCTP achieved its objectives of improving core strength and power without adverse effects on other areas of fitness or injury.[9]

That conditioning program was CrossFit, though not mentioned by name in official USMC documents. The NCO–in–Charge was Gunnery Sergeant Brandon Millsaps, USMC, holding CrossFit level 1 and 2 certifications.

6 Vickers, RR Jr, J.H. Reynolds, J.R. Jordan, L.K. Hervig, "An Evaluation of a Combat Conditioning Trial Program [CCTP]", Naval Health Research Center, Doc. No. 09-02, 11/20/2008

7 Marine Corps Order–MCO 6100.13: Marine Corps Physical Fitness Program (August 2008)

8 *Id.*, Table 1, p. 385.

9 Bold added, Vickers, *id.,* Abstract, p. i.

The final report explains the new program as follows:

> A **functional fitness** concept has been developed to provide the proper alignment of training with operational requirements. Functional fitness is the "…**ability to perform a broad array of natural or realistic physical work.** … " (Amos, 2006). Key elements of the functional fitness concept include:
>
> - Fitness follows combat function.
> - **Physical training must develop power, strength, flexibility, speed, endurance, agility, and coordination.**
> - **Physical training must have great intensity and variety.**
> - **Physical training must be scalable to individual level and be progressive.**
> - Training must emphasize "injury proofing" and active recovery.
>
> The concept of functional fitness has been refined to define combat fitness as the goal of physical training. … The present report compares this Combat Conditioning Trial Program (CCTP) with the usual combat conditioning. The CCTP was developed … with input from … **civilian physical training experts**. The Marine Corps Warfighting Laboratory (MCWL) developed and implemented the plan for evaluating the CCTP.[10]

CrossFit specifically introduced the parts in bold into its program, and its experts have observed that higher fitness always reduces injury rates, and improves recovery and survival. The definition of functional fitness is a paraphrasing of CrossFit's original definition of fitness and "work capacity across broad time and modal domains".

10 Bold added, Vickers, id., p. 1.

HPRC recognized the same evolution of the Marine Corps Combat Condition Program, and explicitly that it was based on CrossFit:

> In 2006, Lt Gen James F. Amos, USMC, the 31st and current Assistant Commandant of the Marine Corps [now General Amos, and since October 22, 2010, Commandant, USMC], described Functional fitness as "the ability to perform a broad array of natural or realistic physical work that involves all tasks associated with performance in combat." He emphasizes that operational and combat demands will vary regarding load and duration which in turn affects intensity of physical exertion, and that traditional training methods do not adequately prepare Warfighters. He further notes that functional fitness involves "multiple planes and joints" in the performance of a real life of combat task, therefore, the Marine Corp should incorporate elements of functional fitness training in their daily conditioning regimen. One approach that has followed this direction is the USMC's Combat Conditioning Program which, although **not strictly based on** CrossFit, adheres to the functional fitness elements of the program and is adapted "For Marines By Marines," using only that equipment that a Marine might find in the deployed setting.[11]

Though not recognized by the *Consensus Paper* in its acknowledgements, HPRC was a sponsor of the conference, and it directs its work solely to "Warfighters, their families, and those … who support them". However, while cautiously recommending CrossFit for Warfighters, it says

> CrossFit is an **extreme exercise program** designed to promote functional fitness. There are no published data on CrossFit-related injuries and no comparisons of injury rates with other demanding physical sports, which are leading causes of Warfighter injury. **The program requires modifications for use by unfit and beginning exercisers.** Bold added, HPRC, CrossFit.[12]

CrossFit is an Extreme Conditioning Program by CHAMP and ACSM's newly minted definition, which they applied as a pejorative. According to the Oxford Dictionaries, extreme is an adjective "denoting or relating to a sport performed in a hazardous environment and involving great risk", and then gives as examples white-water rafting and snowboarding! Really? Did the lexicographers consider cave diving? High-altitude climbing? Free solo climbing? Base jumping? And for the shut-in, Russian roulette? An adult who put his child into such a sport might lose custody on the charge of child endangerment. Conversely, a parent who won't let his child train under CrossFit Kids is not playing with a full deck. Perhaps the loophole here is that notwithstanding HPRC's characterization, it considers CrossFit not to be a sport. What is extreme is CHAMP's and ACSM's inflammatory language.

As to modifications, the program can't require what is already inherent, provided, and featured. HPRC needs to visit CrossFit Kids, CrossFit Longevity, and No Excuses CrossFit. It needs to read "How to Start" on CrossFit.com. It needs to note CrossFit's warning that some movements are too intense for some individuals, and how to prepare for the full intensity. At the same time, no CrossFit exercise demands a specific amount of work. Each is a best effort at the specified intensity, if possible.

11 Bold added, ***HBRC,*** CrossFit. http://hprc-online.org/performance-optimization/physical-fitness/CrossFit

12 http://hprc-online.org/physical-fitness/hprc-articles/is-CrossFit -effective-for-warfighters

In 2008 Gen James T. Conway, Commandant, directed

> Marines will participate in an organizational and individual Combat Conditioning Program (CCP). The PFT, CFT and Remedial Conditioning Program (RCP) are components of an effective organizational CCP. Recent trends and advancements in sports training and physiology as well as findings from the Center for Disease Control and the **American College of Sports Medicine recommend that aerobic and muscle-strengthening activities be conducted more frequently, under higher intensity and of shorter duration.** Doing so provides greater health benefits and results in higher levels of overall physical fitness. Reference (b) [MCRP 3-02A, Marine Physical Readiness Training for Combat] has adopted these recommendations and provides Commanders/Officers In Charge (OICs) and Marines a wide variety of options to select from in developing effective organizational and individual CCP.[13]

The new Marine Corps Physical Fitness Program follows the stated ACSM recommendation by adapting the CrossFit program for the Conditioning. It adds specific fitness standards to be met, which CrossFit does not do. The word ***extreme*** does not appear in MCO 6100.13 (2008). The Readiness Training manual uses the word ***extreme*** exactly nine times: "extreme physical demands of warfare", "extremely hot temperatures", "extreme cold", "Grass drills are extremely strenuous", avoid "extreme formality" in training, fartlek course training can work "extremely well", orienteering "taken to the extreme" is conducted in full combat gear, obstacles in an obstacle course can be "extremely difficult", and avoid "extremely hard ground" in combatives. These are all distinct from CrossFit workouts, but situations CrossFit conditioning anticipates.

CrossFit conditioning is gradual, at each stage safely challenging the individual athlete's abilities in workouts well-mixed in stressing muscle strength, aerobic, and anaerobic responses, but setting no performance standards. CrossFit's policy is reflected in this sample from affiliate Consent and Release Forms:

> YOU ARE RESPONSIBLE FOR HEEDING YOUR OWN BODY'S LIMITATIONS. YOU ARE RESPONSIBLE FOR SETTING YOUR OWN LEVEL OF EXERTION. DO NOT EXCEED YOUR BODY'S LIMITATIONS. ONLY YOU KNOW WHAT THESE LIMITS ARE.[14]

13 Bold added, MCO 6100.13 (2008) ¶1b.

14 Caps in originals. http://www.CrossFit unc.com/images/uploads/CrossFit _UNC_Consent.doc, www.brethrenCrossFit .com/wp.../Rhabdo-waiverTC-docx-20121.pdf

The substance of the Marine Corps Combat Conditioning Program is in Section 3:

> 3. Components. Organizational CCPs will consist of the following:
>
> a. Commanders will ensure their unit CCP addresses the specific unit METL[15] per reference (b)[16] and consists of five 30 minute sessions per week. [CrossFit**: 20 minute workouts, 3 days on/1 off.**]
>
> b. Strength training consisting of compound functional movements should be done at least twice a week, in combination with or separate from cardiorespiratory exercise. [CrossFit**: Functional exercises, mixed in strength, aerobic, and anaerobic, intra-workout and inter-workout.**]
>
> c. Exceeding the guidelines above will result in greater fitness and health benefits, but should be done in a manner that is progressive in nature and provides adaptations to additional physical demands. [CrossFit**: Progressive body adaptations.**]
>
> d. Physical conditioning programs should not be developed solely towards preparation for the PFT or CFT. [CrossFit**: Fitness is work capacity to respond to surprises.**]
>
> e. To the extent possible, commanders will allow Marines to conduct these conditioning sessions within normal working hours.
>
> f. Organizational CCPs will be developed to ensure Marines are able to meet the physical demands of their unit mission and the challenges posed by environmental and operational conditions.
>
> g. Every Marine will develop an individual CCP in order to enhance their ability to meet the physical demands of their military occupational specialty (MOS) while emphasizing the Marine Corps ethos of every Marine a rifleman. The individual CCP is meant to augment not replace the organizational CCP. Bold annotations added, MCO 6100.13 (2008).

In summary, unit commanders and individual Marines are free to design a conditioning program or select an existing program. For unit commanders, the program must meet the requirements of *a* through *d,* which happen to be essential elements of CrossFit, as shown. While the founder of CrossFit invented this method of conditioning, the information is open source on the CrossFit website for anyone to follow or imitate. Only the name CrossFit is proprietary and protected. At present, CrossFit is the only program meeting the conditioning standards above. Under the new Marine Corps program, organizational commanders and individual Marines may satisfy their CCP requirements by following a CrossFit regimen.

15 Mission Essential Task List, MCRP 3-0A, p. 5-1.

16 Ref. (b) is MCRP 3-02A, and doesn't mention MCRP.

3.1.2 The *Consensus Paper* confuses aggressively marketed conditioning programs with CrossFit, which does not advertise.

The *Consensus Paper* creates a straw man category of Extreme Conditioning Programs in order to criticize CrossFit with attributes taken from four other enterprises and with implied pejoratives. Being not just marketed, but "well–marketed" suggests an unwholesome, Madison Avenue-like campaign to sell by misrepresentation, as through exaggeration, repetition, or prestige. The *Consensus Paper* cites no reference for its allegation that CrossFit is "aggressively marketed", and cannot for the simple reason that the CrossFit brand, while promoted, is not, and never has been, advertised. The distinction being made is that while both promotion and advertising involve publicity, promotion is to enhance the public image of the brand while advertising is to encourage sales. CrossFit has nothing for sale that it publicizes, and it gives away its primary product of conditioning knowledge.

By contrast, access to Gym Jones' workouts requires individuals to buy memberships at $50 month to $500 per year.[17] Insanity sells its ten workouts on ten CDs for "just 3 monthly payments of $39.95 (+ $24.95 s&h)".[18] P90X sells a Home-Fitness System for $140 with a 90-day money back guarantee. (PT Pyramid appears not to be a conditioning program, but instead merely a pattern for mixing exercises and rest.[19] As such, it would be analogous to Tabata used in CrossFit.)

The CrossFit corporation sells the unadvertised rights to the CrossFit name to affiliates, who must have an Internet presence, and may advertise gym membership. Some do, perhaps where competition exists, but for the most the CrossFit brand sells itself. It is the better mousetrap which the *Consensus Paper* characterizes as "well-marketed":

> If a man can write a better book, preach a better sermon, or make a better mouse-trap, than his neighbor, though he build his house in the woods, the world will make a beaten path to his door.[20]

The *Consensus Paper* challenges the meaning of *marketing* itself. The authors imply that the ECPs market to the Warfighters. By contrast, CrossFit workouts are free. So are posting athlete's workout results, participation in the CrossFit Discussion Board, and access to a large library of CrossFit 's technical articles. A CrossFitter may buy a subscription to the Journal for more extensive access to the library. He may buy a membership in an affiliate or join an affiliated club offering classes, but only if he wants the advantage of qualified CrossFit training.

CrossFit's growth in affiliates, including its bottom-up penetration into the military, is not based on any program to market affiliate licenses, or to donate licenses to the military.

17 http://www.gymjones.com/memberships/

18 http://www.beachbody.com/product/fitness_programs/insanity.do

19 http://mymadmethods.com/articles/conditioning-articles/1238-extreme-conditioning-pt-pyramid

20 *Bartlett's Familiar Quotations,* 14th Ed., p. 605a. Attributed variously to an 1871 talk by Ralph Waldo Emerson.

3.1.3 The *Consensus Paper* Claims Contrary Evidence To Be Anecdotal, Ignoring Well-designed Army Demonstrations of CrossFit Efficacy.

The bane of science is anecdotal evidence. The *Consensus Paper* authors summarily dismiss contrary evidence as anecdotal, and ignore factual evidence. This is the fallacy of the anecdotal accusation: imply your own writings are science by claiming that contrary factual evidence either does not exist, or that if it did, it would be "anecdotal".

CrossFit is indeed growing in the military services. As of May two years ago, CrossFit non-profit affiliates on military installations numbered 58 worldwide. (See also HPRC report, above.) HPRC, sponsor of the HIT Conference, says,

> CrossFit has gained immense popularity among military and law enforcement personnel; it has replaced or is used to augment traditional military physical training in many units. The U.S. Army conducted a recent CrossFit study wherein 14 men and women received initial and post-study physical assessments of their ability to perform a variety of functional movements.[21]

The Army study is Paine, J., J. Uptgraft, & R. Wylie, "CrossFit Study", Command and General Staff College (CGSC), Department of the Army, May, 2010.[22] From 2006 to 2008, the U.S. Marine Corps conducted an evaluation of CrossFit-style training, at its conclusion adopting it as the new standard for the Corp. MCO 6100,13, above. The reports of marked gains in fitness might be anecdotal in academe, but not to Warfighters.

> In units across the U.S. Army, CrossFit is replacing or augmenting traditional physical training methods.[23]

The effects among Warfighters and others has been that CrossFit affiliates increased overseas to 138 by May 2012, a growth of 56% per year–double the rate among all affiliates–and achieved just through testing the better mousetrap.

The Army CrossFit Study was a comprehensive program to measure the efficacy of CrossFit on a sample of 14 subjects from 150 volunteers at the CGSC Class 2010-2011. Nine male and five female officers with a wide range of CrossFit experience trained for six weeks according to the CrossFit Training Guide under a minimum of four one-hour sessions per week. The authors did not report any adverse effects, and concluded,

> Generally the athletes in the study experienced relatively equal increases in power output in each of the assessments. Based on how we devised the assessments, this indicates a balanced increase in **performance across metabolic pathways** and across the ten general physical skills. We believe the consistency of improvement across assessments validates the CrossFit program's claim that it produces a broad and inclusive brand of fitness. From the perspective of the U.S. Army, this is significant because capacity across metabolic pathways and modalities characterizes the type of versatility required of U.S. Army Soldiers.[24]

The CGSC authors reported a similar but unpublished study the year before by the military affiliate CrossFit Centaurion Fort Hood. *Id.*

21 HPRC, "CrossFit ". http://hprc-online.org/physical-fitness/hprc-articles/is-CrossFit -effective-for-warfighters

22 http://www.25idl.army.mil/PT/U.S.%20Army%20CrossFit %20Study.pdf

23 CGSC, "The CrossFit Study", p. 1.

24 Bold added, *id.*, p. ii.

CGSC's CrossFit Study attributes the theory of conditioning across three metabolic pathways to the CrossFit *Training Manual,* accessed in 2010. The *CrossFit Journal* discussed these pathways in the article, "What Is Fitness", posted in October, 2002, shortly after CrossFit first appeared as an Internet entity, February 10, 2001. A U.S. Army source confirms that CrossFit is based on textbook physiology.[25]

The Army's "CrossFit Study" reported,

> In order to test the efficacy of the CrossFit program, this study measured the change in level of **physical fitness (defined as an athlete's work capacity across broad time periods and modal domains)** of fourteen athletes during eight weeks of physical training utilizing the CrossFit program.[26]

That definition of fitness is correctly attributed to CrossFit:

> We define fitness as **increased work capacity across broad time and modal domains.**[27]

It is also fully consistent with Army teaching, and with the breadth of fitness required for unit readiness.[28]

Secondly, the CGSC authors were the first to score athlete performance by estimating total work delivered. They applied static models for different events or exercises to estimate work and power. Because power is not additive here[29], a total power score is only a figure of merit. Work, however, is both additive and compliant with the definition of fitness. The Army's "CrossFit Study" evaluation contains a promising method for more advanced formulas and scoring multiple competitive events.

3.1.4 The *Consensus Paper* appeals to its fabricated opinions of Warfighters.

Having no Warfighters authoring the conference papers, including the *Consensus Paper,* and having supplied no quotations from any Warfighter, nor citing HPRC, the sponsor of the convention dedicated to supporting Warfighters, the *Consensus Paper* can only pretend to speak for Warfighters. Here is a critical sampling from among *Paper*'s 16 references to Warfighters:

> In addition, some Warfighters believe these programs contain functional training that directly translates into more effective performance on the battlefield. *Consensus Paper, id.,* p. 383.

To say Warfighters *believe* it to be true implies that their perception is mystical or based in faith, as in trust in the authority of charlatans.

The sentence is true, of course, in logic or in law, as in "men kill their wives!" The claim about Warfighters is unacceptably misleading as a scientific statement because it is vague (*some, believe*), factless, and a conclusion. The statement is improbable, and unlikely to have ever been asserted had the authors consulted with Warfighters, or relied on their investigations. At the unit level, all four combat services have introduced functional fitness as a means to increase combat readiness, as in the US Army Ranger Athlete Warrior [RAW] program, and service wide in the Marine Corps, above, and the Navy in its NOFFS [Navy Operational Fitness and Fueling Series] program.

25

26 Bold added, "CrossFit Study", p. 1.

27 "What is CrossFit ", 2011. http://games2011.CrossFit .com/about-games/CrossFit .html

28 See Vogel, Notes 1 ("energy generating capacity") and 5 ("mode … and extent"), Part IV, below.

29 $W_1/T_1 + W_2/T_2 \neq (W_1+W_2)/(T_1+T_2)$

Each of many cognitive verbs–*assume, believe, bet, conjecture, consider, doubt, expect, fancy, feel, figure, gather, guess, imagine, judge, know, postulate, presume, reckon, perceive, sense, suppose, surmise, suspect, think, trust, and wonder*–which the authors might have assigned to the Warfighters' perception of the efficacy of physical training has its own subtle implications as to Warfighters thought processes and their residual doubt and feelings about the proposition. For example, had the authors said the Warfighters *think* the proposition is true, readers might anticipate a disproof or debunking would follow.

> For the military, a higher incidence of musculoskeletal injuries resulting in lost duty time, medical treatment, and extensive rehabilitation is[(a)] a significant and costly concern with regard to effectively maintaining physical and operational readiness[(b)] of the Force. Unfortunately, to date, the short- and long-term physiological, functional, and readiness outcomes or safety of ECPs has not been carefully[(c)] studied. Accordingly, the evidence-based, peer-reviewed literature[(d)] does not yet support the efficacy for or clarify any notable injury risk potential with ECPs to validate or dismiss the claims, clinical observations, or media reports.[30]

(a)To say "a higher incidence of [such injuries with attendant consequences] **is** a significant and costly concern" (bold added) implies the existence or truth of the proposition, which the rest of the paragraph denies. A higher incidence of the events described **would** be a concern, should they ever materialize.

(b) The Textbooks of Military Medicine state that better conditioning reduces the risk and cost of injuries, a fact because it agrees with experience. The *Consensus Paper* misses the trade-off between the training injuries incurred to harden the trainee as a warfighter.

(c) Reading the word ***carefully*** literally as in a scientific paper, the *Consensus Paper* implies that both the Army's "CrossFit Study" with its six-week trials and the Marine Corps's ***Combat Conditioning Trial Program*** were executed carelessly, a baseless charge. The *Paper* provides no evidence or critical analysis to show that these trials violated good military practices or scientific principles.

(d) The criteria of peer review and publication are peculiarly academic standards of post modern science by which to perpetuate and enhance doctrine. These are alien standards in both the military and most industrial science, where Cause & Effect is tested and exploited, objectively and usually in secret, in accord with the objective principles of modern science.

What "some Warfighters believe" is belittling on two grounds. It is procedurally demeaning because the authors provide no source, peer-reviewed or otherwise, for attributing the proposition to a belief. It is substantively disparaging because it suggests the proposition is not true. That is, the *Consensus Paper* implies either (1) "these programs" do not contain functional training, or if they do, that (2) functional training does not "translate into more effective performance on the battlefield."

Warfighters *know* that at least one of the so-called ECPs produces functional fitness, and that functional fitness is efficacious on the battlefield. They also know from experience that it is a high state of health that eases the transition out of warfighting. Once the efficacy of functional fitness is seen as knowledge, the ultimate of cognition–science–takes over. At this point, the information is suitable for scientific modeling to quantify the extent of the efficacy or benefits, the costs, the risks, and the probabilities, all to predict outcomes and postulate experiments to increase the quality of the knowledge. Is it a conjecture (incomplete in cause and effect), a hypothesis (complete with predictions yet to be validated), a theory (substantial, novel prediction validated), or a law (all consequences validated)? Having cast what Warfighters know as mere belief, the *Consensus Paper* had no need to challenge the proposition that functional fitness is efficacious.

30 Annotation added, *Consensus Paper,* p. 384.

The truth of the proposition is demonstrated by the facts of Military Medicine, the services trials, and the adoptions into new functional training regimens. While the *Consensus Paper* provides no facts attributable to the Warfighters themselves, an alternative authority does exist: HPRC, the education branch of CHAMP, which at least speaks ***to*** the Warfighters and so might presume to represent them.

HPRC is the Human Performance Resource Center, a searchable, web-based repository. It is a "DoD initiative under the Force Health Protection and Readiness Program". HPRC asks "Are high-intensity training programs safe and effective?"[31] and answers it as follows in its entirety and annotated:

Background

The Department of Defense (DoD) and American College of Sports Medicine (ACSM) convened a workshop at the Uniformed Services University, Bethesda, Maryland to address the issue of high-intensity training (HIT) programs. During this session, scientists agreed that it would be more appropriate to refer to HIT programs as Extreme Conditioning Programs (ECPs). [Click here] to read the executive summary of the workshop.[a]

Myths[b] and Claims

ECPs and their followers claim that these programs are safe, science-based, and able to produce a balanced physique that can perform across a number of occupational demands.

Facts

Participants are often encouraged to exercise until they "puke."[c] Yet many military physicians have cited anecdotal reports of a high injury rate with these programs.[d] Many individuals may not have a sufficient level of fitness to engage in such high-intensity exercise without considerable risk of injury.[e] The fact is that no published data exist that compare these programs to other high-intensity activities such as running and basketball, which are among the leading causes of musculoskeletal injuries in military personnel.[f]

ECPs such as CrossFit, P90X, Insanity, Gym Jones, and PT Pyramid are multidimensional programs that use various training methods: repeated body weight exercises, resistance training with barbells and kettlebells, explosive movements, sprints, and flexibility training. This variety prevents boredom and targets an area of unmet training needs among Warfighters. Individuals often find these programs challenging, motivating, and exciting. Many testify that they have never been in better shape.

On the other hand, certain aspects of ECPs violate well-established safety and efficacy principles.[g] This tendency[h]—coupled with inadequate recovery time—promotes fatigue, a greater perceived exertion during the activity, and may possibly[i] lead to overtraining consequences. When these programs are performed in military group settings, the less fit individuals can easily overreach their physical capacity and become injured. These programs are not always balanced to meet all training needs. [j]

Cautions

Since the positive aspects of ECPs have been recognized, and since these programs appear to meet a perceived or actual unfulfilled training need, individuals and military units using them should proceed with caution. Research is needed to determine risk versus benefit of these programs, and modifications are needed to accommodate less fit individuals and prevent injury.[k]

31 http://hprc-online.org/physical-fitness/hprc-articles/are-high-intensity-training-programs-safe-and-effective-2

(a) That some scientists did agree to the name change is clear, but no conference record exists to show exactly how that change evolved, nor why this was the only result reported from the conference. The Executive Summary lists the ECPs as including "CrossFit, P90X, Insanity, Gym Jones, and PT Pyramid", expanding the list in the *Consensus Paper* by two. However, under the topics of "functional fitness programs" and "functional fitness", the only program HPRC explicitly mentions is CrossFit. HPRC papers include the Army Ranger RAW [Ranger Athlete Warrior] Workout, a functional fitness program allegedly based on both CrossFit and Gym Jones, but with a stated preference for the latter.

(b) HPRC includes "Myths" only in the heading as if to suggest that the claims it shows are not valid.

(c) The alleged encouragement to vomit is false and unsupported. Vomiting like exertional rhabdomyolysis are realities of exertion, and CrossFit warns everyone about these possibilities with training and cartoon characters, Pukie and Uncle Rhabdo. Pukie is "a benchmark to measure your intensity and **reel it back before it's too late".**[32] "Death is nature's way of telling you to slow down" goes the old saw. CrossFit adds that vomiting and discolored urine are signs that you have gone too far. CrossFit no more encourages participants to exercise until they vomit than it encourages them to exercise until they fall to rhabdomyolysis.

(d)HPRC appeals to alleged authority (***many military physicians***) and their alleged publications (***have cited***) to support claims from the rumor mill (***anecdotal reports***). The alleged ***high injury rate*** remains a fantasy, existing or in the future, for all conditioning and training programs under consideration, in particular including military PT and CrossFit.

(e) CrossFit prescribes nothing less in its article "How to Start", featured on its Internet home page, and fraudulently misrepresented by Zambraski in his presentation to the Conference.

(f) HPRC admits that no data exist, at least published, to support either that CrossFit is safe or safer than military PT, or the CHAMP/ACSM authors' claim that it is harmful. Instead the University of Nevada, Reno, CrossFit, informed its ACSM audience that in over 87,000 supervised CrossFit exercises, only one injury occurred (Chart 12), and by private communication, that that was to a tendon which recently had been surgically repaired. That datum was from UNR CrossFit affiliate Associate Professor Nora Constantino, PhD, FACSM, and presented at ACSM's 16th Health & Fitness Summit & Exposition, March 29, 2012.

(g) HPRC provides no example of either side of this violation: an aspect of an ECP, or a "well-established safety and efficacy principle" which might begin to support its claim that a plurality of such violations exists. CrossFit would not argue that its training principles are anything but a major departure from traditional military PT, but military PT is inadequate and dangerous, producing a grassroots revolt.

(h) What was certain with a multiplicity of aspects in the first sentence is contradicted as a "tendency" in the second.

(i) The notion of "inadequate recovery time" is a supposition. Coupled with alleged violations of "well-established … principles" creates a mere possibility, casting everything said about harmful practices as hypothetical.

(j) Any training or conditioning undertaken in regimented military fashion, in unison, and by the numbers, is a "one size fits all" approach certain to produce either no results or injury. Textbooks on Military Medicine, like CrossFit, prescribe individualized training and conditioning.[33] No program can meet "all training needs" without individualization and the sacrifice of the balanced appearance of a drill team.

(k) Such modifications are essential features provided by CrossFit, and include scaling intensity to individual capabilities, substitute exercises as needed to accommodate physical or conditioning limitations, and mastery of movements before undertaking loaded exercises. In addition, while all workouts prescribe a nominal intensity, the work produced is always to the current capabilities of the athlete.

32 Bold added, comment explicitly endorsed by Greg Glassman, October 16, 2003. http://board.CrossFit .com/showthread.php?t=468

33 See Vogel, *id.*, Part IV, below, Note 8.

3.1.4.1 Gym Jones offers unauthorized and compromised CrossFit.

Gym Jones claims to be based on CrossFit, but it differs from CrossFit in the most important attributes. The difference arises principally from the definition of fitness, and as a result in the physiology of fitness and the degree of improvement that an athlete can attain. That difference is important because of the recommendation that the US Army RAW program prefers Gym Jones over CrossFit , and because the *Consensus Paper* has erroneously generalized from its group ECPs to CrossFit.

CrossFit defines fitness as "work capacity across broad time and modal domains", and provides a conditioning program geared to increasing each person's fitness gradually and proportionally, and then maintaining that fitness. Conditioning that promotes appearance, or that is sport-specific, as included in the Gym Jones program, must blunt the conditioning that can be achieved through dedication to general work capacity.

Mark Twight, Gym Jones owner and former CrossFit Level 1 trainer, explains his model in the Gym Jones Manual. The first chapter is *Define Fitness*, and it begins:

> **What is fitness, and why work for it?**
>
> Each individual must ask this question before engaging in a training program. Without a definition or stated objective no training program may ever be judged successful or not.
>
> 1) What am I trying to achieve with my training program?
>
> a. Am I training for the sake of **appearance**?
>
> b. Am I training for a general function with overall fitness high enough to do "**anything, any time**" (firefighting, military special operations, paramedic, martial arts, etc) i.e. **general physical preparedness (GPP)**?
>
> c. Am I training for a **sport-specific** application where technique must also be refined and peak performances may be "scheduled" through periodization annually or biannually?
>
> 2) Once the objective is defined one must analyze the current program in relation to the goal. Program assessment must include an unsentimental (BS-free) analysis of one's current fitness and overall health – without an understanding of the present it is difficult to prepare for the future.
>
> a. If GPP is the goal, does my training program cause adaptation toward a balanced, general functionality, training all energy pathways **to a maximum concurrent capacity**?[34]

Gym Jones' GPP, which he also refers to as his Foundation Program, is CrossFit, rebranded, misunderstood, and ready to be compromised to include body building or sport-specific training. It says,

> One training idea stands out as providing the best and broadest results within the context of general physical preparation (GPP). It's called CrossFit and it may be quickly described as, "constantly varied, if not randomized functional movements executed at high intensity."[35]

34 Underline in bold added, Twight, *id.,* p. 3.

35 *Id.,* p. 16. The word *constant* has two primary meanings, (1) not varying or (2) unceasing. To avoid creating an oxymoron, "constantly varied" must mean unceasingly varied. "Collectively, these three attributes (load, distance, and speed) uniquely qualify functional movements for the production of high power Intensity is defined exactly as power, and intensity is the independent variable most commonly associated with maximizing favorable adaptation to exercise." Greg Glassman (2007), pp. 1-2.

The unattributed phrase in quotes is from the opening sentence of the CrossFit Journal Article, "What is CrossFit", of March 2004.[36] CrossFit restated that idea in 2007:

> The CrossFit prescription is "constantly varied, high-intensity, functional movement." … Collectively, these three attributes (load, distance, and speed) uniquely qualify functional movements for the production of high power. Intensity is defined exactly as power, and intensity is the independent variable most commonly associated with maximizing favorable adaptation to exercise.[37]

Twight never defined intensity, but his usage is ambiguous. He says,

> the ability to produce power or perform at high intensity for short periods of time.[38]

High intensity here cannot mean high power, because that would render the final clause "for short periods of time" meaningless, tending to make the whole thought a tautology, i.e., "ability to produce power or perform at [high power]". He also refers to "repetitions of the movements at low intensity (load)". However, he also says "the short duration indicates a very high level of intensity" (*id.*, p. 44) and "intensity is inversely proportional to duration" (*id.,* p. 76). Power is work per unit time, suggesting he is thinking of intensity as power. He also has "work intensity" (p. 46), "aerobic intensity" (p. 45), and "anaerobic intensity" (p. 113).

One of the Textbooks on Military Medicine says,

> By exercising at a level above "normal" (overload), the body responds physiologically to accommodate this greater load until that load becomes the norm. The overload must be presented progressively and with sufficient intervening recovery time to avoid damage or failure to the systems involved. The added load can be presented by increasing the intensity, duration, or frequency of the training activity. ***Intensity*** refers to the absolute level of exercise (strength of the stimulus), such as speed of running or the amount of mass lifted.[39]

If intensity can be mass or weight, it is neither power, nor work, nor work capacity.

That misunderstanding from lack of a definition could lead Gym Jones to faulty execution of CrossFit, and it underlies CHAMP's and HPRC's mistaken characterization of CrossFit conditioning or workouts as extreme. CrossFit has defined intensity to mean within its articles as power, but at the same time, "high intensity".

On closer examination, CrossFit workouts are no more "high intensity" than they are ***high frequency***, ***long duration***, ***low variability***, or ***high power***. In its proprietary Level 1 training handbook, CrossFit says on the subject "High Intensity"

> How Intense? Relatively intense. Intensity is relative to the individual's physical and psychological tolerances.
>
> CrossFit's general prescription is to perform a wide variety of functional movements at (relatively) high intensity.[40]

36 http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0CM0BEBYwAg&url=http%3A%2F%2Fwww.CrossFit .com%2Fjournal%2FCrossFit %2F&ei=K-AIUPWKD8q7qAH3jIDYCQ&usg=AFQjCNFDgQdvmQpiu1UYmYzsw-mopcZBQw

37 Greg Glassman, "Understanding CrossFit", April 2007, p. 1.

38 Twight, *id.*, p. 10.

39 Italics in original, Part IV, Vogel, *id.*, Note 7, below.

40 Todd Widman, "A CrossFit Startup Guide: Part 2", CrossFit Journal, 2009, p. 6.

Whatever the verbal definition of intensity, the empirical definition is plain from the workouts, and CrossFit is nothing if not empirically developed. The rule is that CrossFit workouts prescribe movements and patterns, and they suggest loads, but they are as much or as many or as quickly as possible. No exercise is known that violates this rule. As a consequence, the workouts are open-ended with respect to both power and work. Alternatively, each workout is individualized. They are all high intensity in the sense that the individual performs to the maximum of his ability that he can muster at the time, and they are high intensity in the sense that the individual is encouraged to do more or do what is prescribed faster each workout–progressively more reps, greater weight, greater distance, less rest, faster time.

Gym Jones is different. For example,

> Each workout is scaleable to an individual level of fitness: reduce loads and distances or number of reps. E.g. Day 10 could be modified to accommodate a deconditioned athlete by using a lighter ball and doing assisted pull-ups. This is preferable to reducing the number of reps prescribed for either movement.[41]

CrossFit workouts usually do not specify the total number of reps.

Each CrossFit workout in general has four intra-exercise attributes. First, the workouts prescribe one or several different movements to exhaust the whole body well before overstressing any single set of muscles or pathways. Second, instead of being *high*, the intensity of each movement is within the capabilities of a large majority of athletes to complete one full rep within a reasonable amount of time, say, 20 minutes. If not, CrossFit encourages substitutions within the same pathway. Third, the workouts prescribe rest at various points between rounds, sets, or movements.

Fourth, the workouts do *not* prescribe the energy (work) or power the athlete is to expend, but instead specify a parameter that would determine the work completed or the power delivered. The energy or power is the benchmark of fitness, the scientific parameter that measures ability and progress. Measured progress is what makes CrossFit safe, individualized, and effective. Each athlete learns what he can do with a reasonably strenuous exercise, and he can gradually increase his performance.

Conditioning activates natural processes that increase physical capacity. An overload triggers minor damage called microtears–a little bit of exertional rhabdomyolysis. The threshold amount required is a capacity that varies among individuals, and differs between environments, especially temperature and altitude. With CrossFit, it is learned by the athlete, and measured in open-ended workouts. What one athlete can do could be lethal to another, but that is irrelevant. CrossFit holds athletes to no work capacity standards.

CrossFit workouts are not tests to be passed. They are the core of a conditioning program, not a qualification program.

Gym Jones says,

> To improve, individuals must accept that they haven't **reached their potential**[(a)], and be willing to take the cure. The **GPP goal**[(b)] is achieved by training a wide variety of energy systems and movements, with emphasis on muscles, muscle groups and movements that are the foundation of daily functional and **athletic movements**. This same program may also be used to build a solid foundation and **starting point** for a periodized, sport specific application, which is designed to address the particular neurological and efficiency demands of the sport.[(c)] Such a GPP, or Foundation program **should** have a positive influence on all indicators of health (rather than slowly exhausting the athlete or causing injury or imbalance)[(d)].[42]

41 Twight, *id.*, p. 26.

42 Bold, annotation added, Twight, *id.*, p. 4.

(a) CrossFit workouts provide no way to measure an athlete's ***potential***, only to assess his current work capacity in a particular workout. The military and police set such qualifying standards, but they are often one dimensional while CrossFit workouts may include multiple pathways which are varied workout to workout.

(b) CrossFit has no such discrete goal. It specifies familiar functional movements for the athlete to master and use in pursuit of the goal of continuous, measurable improvement. CrossFit's goal is not achieved; it is reset each workout.

(c) CrossFit considers its program to be a sport of sorts. It is "of sorts" because it is unique among sports. Its "neurological and efficiency demands" are neither particular nor predictable. It is like the German Shepherd dog that does everything–second best. The CrossFit kennel has no one-trick dogs. It produces no particular physique, like that of the Sumo wrestler, the distance runner, or the body builder, characteristics that can be identified with a sport and which show obvious weaknesses for other sports.

(d) The CrossFit program with its prescribed rest periods is designed for full-time, safe use. Concurrent sports specific-training may require cutting back on CrossFit, but the athlete might consult a CrossFit trainer so that any sports specific-training could be a replacement workout. The CrossFit program is gradual and maximal, while its workouts are quick and sudden. It is intended to exhaust, and to cause minor injury, i.e., microtears that induce natural rebuilding and super repletion[43], in a balanced program across the three metabolic pathways.

The Gym Jones Manual supplies no reason for making the benefits of CrossFit conditional ("***should*** have a positive influence"). It is literally textbook conditioning guaranteed to work for a normal human being.

Summary. CrossFit is open-ended on the fitness scale, at least to the speculative limits of physiology and kinesiology. It creates a continuously measurable improvement, or maintenance, from an equally open-ended library of functional workouts, each lasting up to about 20 minutes, performed three days out of every four. Prescribed intervals between sets, rounds, circuits, and workouts are periods of rest. They are to allow repair and growth, and are not to be filled with other workouts or other physical exertion affecting the same groups of muscles or pathways. They are for eating, sleeping, sex, entertainment, earning money, and, if any time is left, don't forget mental exercise and training. Almost any sport-specific training added to the individual's conditioning program requires a sacrifice in CrossFit's broad spectrum training.

CrossFit conditioning features two major components: functional movements, and broad–spectrum (time and modal domains) fitness. Body building is non-functional in both its attributes of bulk and muscle definition. Sport-specific training sacrifices one part of the fitness spectrum for gains in another, and many of those trade-offs, such as those involving body mass distribution, are obvious. Upper-body development is a net liability for runners. If runners interbred only with runners, a new species of tailless Homoraptors would emerge. Weight loss for a well-conditioned wrestler or a 400-pound lineman is a liability. The force a wrestler can generate in a scissor hold would likely be compromised by training to develop a runner's stride.

Gym Jones adopted a different definition of fitness, one that accommodates non-functional movements to focus on sport-specific movements at the expense of others. Coupled with errors in understanding scalability and intensity, the Gym Jones GPP training, while claiming to be based on CrossFit, is not CrossFit.

43 See Part IV, Vogel, *id.*, Note 8, below.

3.1.5 The *Consensus Paper* demeans Warfighters with subjective, unscientific conclusions.

The following two sentences already discussed for presuming to speak for Warfighters and for the *Paper*'s failure to resolve anecdotal evidence.

> [S]ome Warfighters believe these programs contain functional training that directly translates into more effective performance on the battlefield.
>
> For many Warfighters, the demanding exercise pace, overall difficulty, and perceived potential for "getting ripped" are appealing, exciting, motivating, and appear to target a niche of otherwise unmet training needs and desires. *Id.*, p. 384.

Analysis of the Gym Jones program shows that the Warfighters' alleged belief that the Extreme Conditioning Programs contain functional movements is true. It is so solely because the *Consensus Paper* included CrossFit in the mix. The phrase "some Warfighters believe" is not to introduce a fact, but a point that the authors want to convey as irrational. To reinforce an implied aura of objectivity for the *Paper*'s pronouncements, it casts what Warfighters think as mere beliefs. Moreover, it inserts the adjective *some* to suggest that whatever beliefs Warfighters might hold are significantly less than unanimous.

The *Consensus Paper* belittles superior conditioning that might be achieved by novel programs as "getting ripped", suggesting, with the support of neither analysis nor evidence, that any fitness gains by other than traditional military PT are merely cosmetic. To mask the reality that the authors have no data, they allege to speak for "many Warfighters", buoyed by an alleged quantity. But this is analogous to the blank round in the firing squad's load. If they had spoken for all Warfighters, that would be immediately seen as false and impossible to know. Speaking for some vague number as *many,* no one would be inclined to show that two or three such Warfighters did not exist within the ranks of tens of thousands of troops. However, a scientific article would quantify words like *some* and *many* with facts, and would not, outside of a study in psychology, rely on beliefs as evidence.

> That is, more than just increasing physical fitness and work capacity, the assortment of specific exercises and challenging repetitions arguably addresses a broad range of "in-theater," real-world operational physical activities and demands and psychological discipline that Warfighters believe will elevate combat readiness. When performed in group settings, ECPs also can promote unit camaraderie and teamwork.[44]

Lacking any citation for "in-theater", the authors apply scare quotes for subjective, editorial purposes. This is consistent with the article comprising authors' individual opinions, but it is not objective. It is not acceptable in scientific writing, and out of place to set military doctrine and policy below the level of the President or Congress, where the bucks stop.

The authors impliedly concede evidence for "increasing physical fitness and work capacity", but then cast these gains as only "arguably address[ing] real-world activities and demands". They imply that these results are psychological, consistent with Warfighters' beliefs, as opposed to knowledge about combat readiness. ECP marketing has thus managed to pull the wool over Warfighters' eyes. To the contrary, these principles and attributes of fitness – only believed to be true by Warfighters according to the *Consensus* – are taught as fact in the Textbooks of Military Medicine.[45]

> In the beginning stages and throughout the program, in the absence of individual fitness- and experience-based guidelines, Warfighters can arbitrarily do as much as they want and feel they should.[46]

44 *Consensus Paper, id.*

45 See Part IV, Vogel, *id.*, Note 1, below.

46 Italics in original, *Consensus Paper*, p. 384.

According to Textbooks on Military Medicine, physical conditioning must be tailored to the individual, to his body type, health, conformity, conditioning, and exposures to harmful agents.[47] But no personal trainer or drill sergeant can determine whether a trainee is in all respects ready for a specific exertion. Because PT, comprising group or synchronized calisthenics and group running, is a one-size-fits-all program, it cannot be challenging, but must instead be limited to some minimally fit but acceptable level, lest the drill sergeant experience embarrassing injury rates.

CrossFit is fully individualized. It differs from military PT and is perhaps unique among all so-called ECPs in that every CrossFit workout, whether used in training or in competition, is open-ended in some essential work parameter, a point missed in the *Consensus Paper* and apparently missed in its supporting papers.

CrossFit workouts call for no more than best effort as determined by the athlete, and it then measures his progress, not his attendance. At all times, the CrossFit athlete decides the intensity, duration, frequency, and mix of his workouts as he is ready to perform them. CrossFit does not drill athletes in unison, or "by the numbers". It is the antithesis of one size fits all and the regimented drill of police academies, football squads, and the military. CrossFit prescribes certain minimum standards for workout parameters, as in heights, weights, or distances, but even these are nominal. CrossFit encourages athletes to tailor their workouts to their individual needs and physical capabilities, and examples are abundant, as for children, and for recuperating or handicapped athletes.

The *Paper*'s ultimate complaint, above, that Warfighters might adapt their conditioning "arbitrarily" suggests that the authors object not to the resulting gains in individual fitness or unit readiness, but to the lack of regimentation and submission to their control and authority.

3.2. The *Consensus Paper* claims ECPs are responsible for a potential emerging, disproportionate injury risk and increased rate of rhabdomyolysis cases, based on a coincidence from health reports and a rise in ECP popularity at policy levels.

The *Consensus Paper* states its worries in the penultimate sentences of the Introduction, introduced in Part I:

> However, physicians and other primary care and rehabilitation providers have identified a potential emerging problem of disproportionate musculoskeletal injury risk, particularly for novice participants, associated with ECPs (13,16). Muscle strains, torn ligaments, stress fractures, and mild to severe cases of potentially life-threatening exertional rhabdomyolysis are reportedly occurring at increasing rates as the popularity of ECPs grows (4,27).[48]

The following sections investigate the four references, 13 ("Hadeed"), 16 ("Mimm"), 4 ("MSMR 17-3"), and 27 ("Tilghman"), showing that they have little to no relationship to the *Paper*'s claims, and one actually contradicts its primary thesis that CrossFit in particular is dangerous.

47 See for example, Part IV, Vogel, Notes 3, 4, and 9, below.

48 *Consensus Paper* p. 383.

3.2.1 Hadeed is an ACSM-sponsored case study of an isolated occurrence of rhabdomyolysis and compartment syndrome for an out-of-condition athlete.

Hadeed (Ref. 13) is a two-page reprint titled "Clinical Case Slide–Heat Illness".[49] This is from an ACSM journal, and the article is sponsored by one of its authors, Diane Elliot, FACSM. It contains no references. The case summary included the following history in its entirety:

> HISTORY: A 33-year-old **previously** healthy and **physically fit** law enforcement officer complained of fatigue, muscle soreness and swelling after a **high intensity** CrossFit **exercise workout**. He reports having had **5 previous days of exercise** but did not involve CrossFit type training. After a **prolonged and extreme** CrossFit **exertional program,** patient reported fatigue, shortness of breath, muscular weakness, and sleep disturbance, and went to the ED 3 days later. …
>
> DIFFERENTIAL DIAGNOSIS:
> Exertional Rhabdomyolysis
> Compartment Syndrome of upper extremity
> Muscle Diseases and Myopathy
> Acute Kidney Injury
> Metabolic disorders …
>
> TREATMENT AND OUTCOMES: Admitted to hospital for fluid IVF. Daily monitoring of CK, muscle soreness.
>
> After 6 days, patient was discharged from hospital with a CK of 995 IU/L.
>
> Returned to high intensity training after 4 months of mild to moderate aerobic training with appropriate instruction on high intensity workout recovery and hydration. Bold added, Hadeed (2011).

As in the *Consensus Paper* itself, ACSM characterizes CrossFit workouts as "high intensity" and "prolonged and extreme" with neither quantitative nor definitional support. By implication but providing no analysis, the previous five days of exercise "did not involve CrossFit type training", as if they were less intense and therefore not significant.

This case is about a police officer who was "previously fit", implying that he was no longer. It implies that he had had no reportable exercise prior to the six days of intense exercise, and only after another three days did he seek medical help. It further implies by the prescription given him on discharge that he had undertaken his six days of high-intensity workouts without "appropriate instruction". This case fits a pattern of once well-conditioned athletes trying to return to their old forms too quickly, a condition for which the Textbooks provide an explicit warning.[50]

This is an isolated case of rhabdomyolysis, a disease difficult to impossible to diagnose except in clusters.[51] The "differential diagnosis" included compartment syndrome, which is difficult to differentiate from rhabdomyolysis, and it may accompany rhabdomyolysis so it cannot aid in differentiating exertional rhabdomyolysis from other etiologies.[52] The case study contains no medical history, and fails to answer obvious questions prompted by the few facts reported. Why had the officer not been exercising? Had he been ill or injured? Had he been, or was he now, on any medication? Had he previously had a case of rhabdomyolysis? Could genetic disorders be implicated? What were the workouts over those six days, and how did they compare with what he had previously been able to do?

49 Medicine & Science in Sports Exercise, v. 43, no. 5, May 2011, pp. 224-225.
50 See Part IV, Vogel, *id.*, Note 13, below.
51 Part IV, Gardner, Note 1, below.
52 Part IV, Walsh, Notes 2, 3, below.

But regardless of whether he was ever in shape, or had other uninvestigated cofactors for rhabdomyolysis, at face value the evidence is that he undertook excessive exercise too quickly for his state of health and fitness. Clusters of rhabdo cases among whole squads of military recruits, football teams, and police academies are legend, brought on by classical physical training imposed after layoffs as brief as summer vacation. This is a case "associated with ECPs" only because ECPs are defined to include CrossFit.

The prescription by the Emergency Department indicts the police officer's trainer. The case study indicts itself or the Emergency Department. Either the reporting or the diagnosis was incomplete to the point of missing the obvious: the athlete was injured by overexertion following a layoff.

3.2.2 Mitchell is a journalist's view of the outcome of a civil lawsuit for damages from a single incidence of rhabdomyolysis alleged to have been induced from CrossFit exercises, a suit to which CrossFit was not a party.

The *Consensus Paper* relies on not just a news article, but one about a civil lawsuit for damages.[53] It is a typical news piece, written by a layman for a lay audience and subjective. It has no authoritative value beyond facts reasonably supported by citations from authorities or witnesses.

The court proceedings were not before a fact-finding body. The verdict in a civil suit is by a preponderance of the evidence, including experts sworn to tell the whole truth selected by adversaries to tell partial truths only favorable to their clients. The decision is reached by a lay trier of fact. This kind of trial weighs evidence subjectively, on believability, sympathy, responsibility, and financial disparity, leading to a decision for one party or the other. These proceedings are not objective, and so are not based on science. Books, equally as authoritative as news articles and packed with anecdotal accounts, are available about such proceedings, calling the physically impossible results "junk science".[54] The legal process comes to a conclusion even when both the cause and the alleged effect are uncertain and statistical.

Mitchell's case is not science. It fails to support the *Consensus Paper*'s claim that "physicians and other primary care and rehabilitation providers … identified a potential emerging problem of disproportionate musculoskeletal injury risk, particularly for novice participants, associated with ECPs". It is a single incident, an outlier report, supported with no facts, and contains testimony from not one physician nor one health care worker.

Lawsuit plaintiff Makimba Mimms claimed he was permanently injured by defendants whose negligence caused him to suffer rhabdomyolysis from a CrossFit exercise. He pled legal proximate cause. Even assuming for the sake of argument that a civil lawsuit could establish either scientific facts or Cause & Effect, the article states that this particular lawsuit asserts those defendants' negligence. The lawsuit did not name either CrossFit, the fitness program, or its owner as a defendant. CrossFit was not a party to the suit, and did not participate even to defend its brand.

The article provides no evidence supporting a differential diagnosis of exertional rhabdomyolysis. It includes no case history to show that plaintiff was not susceptible to rhabdomyolysis by his habits or genetics, or whether he had a history of rhabdomyolysis. It had no information as to his present or past conditioning, or to his recent exercise and health history, beyond admitting that he was "unprepared", making him susceptible to heat injury. The information in the article provides no evidence to contradict the possibility that plaintiff contracted rhabdomyolysis immediately prior to exercising under defendants' care, and took his damaged body to their gym for the purposes of a lawsuit.

The news article has no information as to which CrossFit workout plaintiff thinks caused his injury, or its parameters of intensity, duration, frequency, mix of movements, or rest periods beyond saying that he "endure[d] the extreme exertion prescribed by the CrossFit regimen". The article provides no evidence that CrossFit prescribes "extreme exertion", that it is any more strenuous than any alternative program, that its workouts are not open-ended, scaled to the abilities and condition of the individual athlete.

The news article refers to plaintiff's complaint, but not once to defendants' answers. Instead, Mitchell provides the

53 Mitchell, B., staff writer, "Lawsuit alleges CrossFit workout damaging", Navy Times, 8/16/2008, Ref. 16.

54 Huber, PW, "Galileo's Revenge: Junk Science in the Courtroom", Basic Books, 1993. Kitaeff, J., "Malingering, Lies, and Junks Science in the Courtroom", Cambria Press, 2007.

authority for the dangers in CrossFit alleged in the *Consensus Paper*, saying

> The lawsuit is part of an emerging body of evidence that CrossFit may be damaging to participants' health, perhaps even causing death–a possibility acknowledged by its founder as early as 2005.[55]

This is the source of the *Consensus Paper*'s claim of

> A potential emerging problem associated with increasingly popularized extreme conditioning programs (ECPs) has been identified by the military and civilian communities.[56]

and the "identified [ ] potential emerging problem of disproportionate musculoskeletal injury risk … (13,16)". ***Id.*** An old saying is "everything after the word *essentially* is a lie." *Potential* and *emerging* would play the same role here separately, but compounded into the phrase *potential emerging* are even further from fact. They signify that the evidence does not yet exist, but is a possibility in the authors' minds. An emerging problem would not yet constitute fact, but a *potential emerging problem* is one yet to even emerge. The evidence does not exist.

For writer Mitchell's claim, he supports Mimms' complaint with out-of-context misquotes from Greg Glassman and Eugene Allen in the CrossFit Journal, former commander of the Navy's Center for Personal and Professional Development Capt. Jonathan Picker USN, Mimms's expert Dr. Priscilla Clarkson, along with other experts. As shown next, none of these citations support Mitchell's or the *Consensus Paper*'s claims of the emerging problem, or even the *potential emerging problem*.

55 Mitchell (2008).

56 *Consensus Paper*, Abstract, p. 383.

3.2.2.1 CrossFit Is the Safest of All Fitness Programs.

Mitchell asserts,

> [CrossFit founder Greg] Glassman posted a warning on the CrossFit site in October 2005 labeled "CrossFit induced Rhabdo," telling participants about the potential problems associated with the unforgiving workout . . . . [¶] "With CrossFit, we are dealing with what is known as exertional rhabdomyolysis," he wrote. "It can disable, maim and even kill."

To be clear, what Glassman said can "disable, maim and even kill" refers to rhabdomyolysis, not CrossFit. Furthermore, the article does not use the word *unforgiving* or a synonym in any context, nor any phrase analogous to "unforgiving workout".

The 2005 Glassman article described the five then-known cases of rhabdo associated not with CrossFit workouts, but deviations from them:

1. Rhabdo from "a fast-moving, hard-hitting group workout that included high-rep assisted team pull-ups". Even in competitive CrossFit Games, workouts are to the individual's best effort. Group exercises replace that CrossFit limit of the individual's current state with a drive to keep up with those more fit. This is the danger that induces rhabdo even in the relative benign physical training, not conditioning, of the military, football teams, and police academies.

2. Rhabdo from CrossFit on Monday, CrossFit on Wednesday, several hours of tennis on Friday, Saturday, and Sunday, hospitalized on Monday. A differential diagnosis of exertional rhabdo would have been well-supported, but not the differentiation of CrossFit rhabdo versus tennis rhabdo.

3. Rhabdo from attempting 50 consecutive kettlebell swings. The closest CrossFit workout to this athlete's ill-advised experiment is sensible. It is Helen, comprising three rounds **for time** of 21 kettlebell swings sandwiched between a 400-meter run and 12 pull-ups. The work CrossFit asks of the athlete in the Helen is spread over different sets of muscles and different metabolic pathways, and with power according to the athlete's fitness because the time the athlete requires is measured, not specified.

4. Rhabdo from an attempt to "Tabata" an unknown workout challenge of a friend. To Tabata a CrossFit workout is to repeat it 8 times with 10 seconds between, scoring the least number of reps in any interval. It includes a CrossFit multiplier but not the multiplicand, so whatever induced this case of rhabdo is unknown.

5. Rhabdo in a bodybuilder and runner who ignored warnings to initiate himself to CrossFit on two consecutive days of unknown workouts. Rhabdo is preventable.[57] It is preventable in any program by limiting exertion to the individual's state of conditioning. It occurs frequently among athletes who remember a previous level of conditioning, and attempt to demonstrate it after a layoff. This case is a corollary of that deconditioning problem that the athlete may never have achieved the fitness he imagined from his bodybuilding and running regimen.

The lesson learned according to Glassman, but not reported by Mitchell was the following:

> What the rhabdo outbreak teaches us is that CrossFitters are trained to perform more work, more effective work, and more work **more safely over a given time period than any other athletes.**[58]

When the authors of the *Consensus Paper* relied on Mitchell, they inherited as fact what Mitchell had inherited: CrossFit is the safest of all training or conditioning programs.

57 Part IV, Vogel, *id.,* Note 13, below.

58 Bold added, Glassman, G. "CrossFit Induced Rhabdo", October 2005, p. 3 of 3.

3.2.2.2 Mitchell Misrepresents CrossFit and 'Killer Workouts'.

Following the lead of Dr. Priscilla Clarkson (October 7, 2008, below) but without mentioning her name, Mitchell juxtaposed Greg Glassman's comments about allegedly unforgiving workouts and the sometimes lethal characteristics of rhabdomyolysis with "Killer Workouts", an article by Eugene Allen, a law enforcement officer and CrossFit affiliate.[59] Mitchell, not satisfied with Allen's title, "Killer Workouts", placed Glassman's "can … even kill" observation out from under Allen's name:

> Eugene Allen–a Washington State law enforcement officer who runs a CrossFit blog–posted an even less ambiguous warning in May 2005 titled "Killer Workouts."
>
> "With CrossFit, we are dealing with what is known as exertional rhabdomyolysis," he wrote. "It can disable, maim and even kill."[60]

The *he* originally was Glassman, not Allen, and *he*, Glassman, was speaking about rhabdomyolysis, not Allen's alleged killer workouts.

As Mitchell failed to discover that Glassman warned about CrossFit in the context of being the safest program, Mitchell omitted this qualification from Allen:

> Apparently, one of the three CrossFit pillars (functionality, intensity, and variance) done, **in extremis,** can introduce a character to the scene whom we have dubbed "Uncle Rhabdo".[61]

Surely Allen did not intend *in extremis,* meaning *at the point of death*. He couldn't have meant that CrossFitters were gladiators, unexploded bomb diffusers (*Danger UXB,* 1979), or Chernobyl firemen. Allen is saying that reckless approximations to CrossFit can cause rhabdo. That is consistent with the five known cases by Glassman, above.

Rhabdomyolysis, as the textbooks affirm, is a broad spectrum of diseases. Autism, too, is a spectrum disease, running, on the one hand, from a little, subjective attention deficit disorder (ADHD) (just being a two-year-old) or less likely to "prodigious savants" like Daniel Tammet, to catatonia on the other, a near vegetative state, which, like rhabdo, can be aggravated by certain medications. As the textbooks show, a little muscle damage, the low end of rhabdomyolysis, is the **intent** of all physical conditioning. Also as the textbooks show, exertional rhabdomyolysis is preventable at any level, meaning that it is a consequence of other factors. The objective of conditioning is to induce a little rhabdo.

What the *Consensus Paper* has established from Allen via Mitchell is that the so-called Extreme Conditioning Programs (ECPs), like the military Physical Training they might replace, are dangerous because of trainer malpractice, whether the trainer be a drill sergeant, a personal trainer, or the do-it-yourselfer.

59 CrossFit Journal, *id.*, May 2005.

60 Bold added, *id.*

61 Bold added, ALLEN (2005) p. 2 of 3.

3.2.2.3 Mitchell relies on another news article without confirming the source.

To illustrate official reaction to the growth of CrossFit in the military, Mitchell said,

> Following a June story on the popularity of CrossFit in Military Times newspapers, Capt. Jonathan Picker, commander of the Navy's Center for Personal and Professional Development, posted a story that raised concerns about CrossFit in the July issue of the center's internal magazine.
>
> "Several [experts] in the sports medicine field (military and civilian) have addressed a concern that the program has the potential for causing an increased incidence of musculoskeletal injuries and even muscle breakdown (rhabdomyolysis) and therefore is not supported by [Navy Center for Personal and Professional Development]," the story states. "Granted, anyone can develop a program that's very intense, but there's a safer way of doing this for our sailors." Picker could not be reached for comment.

Other reports of this passage attribute it to the July 2008 issue of CPPD Encompass newsletter, which is unavailable online to validate in its context. Capt. Picker served as commanding officer of CPPD from October 24, 2007 to July 1, 2010. The Navy has taken no action in response to his concerns.

Compared to other citations of Capt. Picker's remarks, Mitchell deleted the last sentence:

> "Additionally, any program that names exercises after women is contrary to our Core Values."

This tongue-in-cheek remark minimizes the seriousness of Picker's remarks, so they need to be seen in a context greater than Mitchell provides. CrossFit is punctuated with humor, as in the cartoon characters Pukie and Uncle Rhabdo, and the naming of exercises after women. "A buck well-spent on a Springmaid Sheet" was a slogan too racist, too sexist, and too politically incorrect for anything but the humor to survive. Regardless, instead of trying to reach Capt. Picker, Mitchell should have contacted Capt. Chuck Hollingsworth, the present CPPD commander, for the official position of the US Navy and Marine Corps on CrossFit.

Capt. Picker's concerns in 2008 were the express topic of the "High Intensity Training Workshop" at USU, Bethesda, on September 13 and 14, 2010, chaired by CHAMP, sponsored by HPRC, a branch of CHAMP, where attendees reportedly included representatives of the Navy and Marine Corps. Perhaps the official Navy position was to defer any decision until after the results of the workshop could be considered. In the meantime, the growth in CrossFit affiliates continues unabated, as can be seen by searching for CrossFit at .mil.

3.2.2.4 Mitchell relies on Dr. Priscilla Clarkson, FACSM, a policy level spokesperson for ACSM, and an activist and courtroom expert for the dangers in eccentric exercises.

Mitchell's article features Priscilla Clarkson, mentioning her by name. He said in its entirety,

> Dr. Priscilla Clarkson of the University of Massachusetts contends that Lopez encouraged Mimms to perform exercises known to produce rhabdomyolysis. "Adequate precautions to prevent such a condition from occurring were not taken," Clarkson wrote in documents prepared for the lawsuit.

Dr. Clarkson is important to the *Consensus Paper* for her influence as an expert on the Mimms lawsuit, directly and indirectly for her influence on Mitchell, for her influence on co-author ACSM as a current editor of one of its publications, and as a former officer of that organization at its highest policy level. Here are her bona fides:

> A Distinguished Professor of Kinesiology, Professor Clarkson is a fellow in the American College of Sports Medicine (ACSM), and she has served as a member of the Board of Trustees. She served as President of the New England Regional ACSM Chapter, Vice-president of the National ACSM, President of the National ACSM, and President of the ACSM Foundation. She received the 1997 ACSM Citation Award, the 1999 New England ACSM Honor Award, the 2001 Excellence in Education Award from the Gatorade Sport Science Institute, the University of Massachusetts Chancellor's Medal in 1997, the 2005 National ACSM Honor Award, the University of Massachusetts Award for Outstanding Accomplishments in Research or Creative Activity, 2005, and the University of Massachusetts Graduate School Centennial Award, 2008. In 2007, she presented the keynote plenary Wolffe Lecture at the National ACSM meeting in New Orleans, attended by 5000 members.[62]

> Priscilla M. Clarkson is Dean of Commonwealth Honors College and Distinguished Professor of Kinesiology. Professor Clarkson has published over 200 scientific articles and has given numerous national and international scientific presentations. The major focus of her research is on how human skeletal muscle responds to environmental challenges such as over-exertion exercise resulting in muscle damage and disuse resulting in atrophy. She has also published in the area of sport nutrition. Professor Clarkson served as the Editor for the International Journal of Sport Nutrition and Exercise Metabolism for 8 years, serves on the editorial or advisory boards for several other scientific journals, and is currently the Editor-in-Chief of Exercise and Sport Science Reviews. Muscle Biology and Imaging Lab, University of Massachusetts Amherst.[63]

Exercise and Sport Sciences Reviews is an ACSM publication.[64]

The sentence Mitchell placed in quotations, above, is from an attachment to Plaintiff's Designation of Expert Witnesses, July 14, 2008, posted online in a package of available documents filed in the case.[65] Plaintiff Mimms said this of her anticipated testimony:

> In general terms, she is expected to address the subjects of the effects of exercise on muscle tissue, exercise induced Rhabdomyolysis, CK levels in the blood, the physiological causes therefore, the risks, the pain, the discoloration found in urine, the effects on the kidneys, the need for medical treatment, the known protocols and methodologies for preventing and avoiding Rhabdomyolysis (including warning the client, assessing the client, reduced intensity of exercise for novices to that particular exercise, observation of the client good hydration, monitoring of urine and the need to seek immediate medical care) and the standard of care expected of persons acting as personal trainers or physical trainers.

62 https://www.honors.umass.edu/dean-priscilla-clarkson. May 21, 2012.
63 http://www.umass.edu/mbil/
64 http://journals.lww.com/acsm-essr/pages/default.aspx
65 http://media.CrossFit.com/cf-video/MakimbaPkg.pdf

This is the inflated promise of expert testimony, not fact. It is neither testimony, nor the testimony of a percipient witness, as reported by Mitchell. Clarkson should not have been permitted to testify to any of the parameters of the exercise Mimms alleged, to his mental or physical condition at the time, to the environmental conditions at the time, or to his coaching. As an expert she may testify to her opinion on the statistical or physiological, Cause & Effect consequences of hypothetical exercises under hypothetical circumstances as might be described to her.

Any testimony by Clarkson that Defendant trainer Javier "Lopez encouraged Mimms" to act in any way should have been struck by the court as a matter of law on the grounds she did not witness the alleged encouragement, essential to the legal case. She might have testified legitimately that under the circumstances given, encouragement would have been a cofactor tending to induce rhabdo, if that was indeed her opinion. Further and regardless of Lopez's actions, she should not have been allowed to testify as a matter of science that "Mimms [did] perform exercises known to produce rhabdomyolysis". She could have testified to specific exercises and circumstances that might be known to induce some specific range of exertional rhabdomyolysis, and how that might have been known by Lopez. It was for the trier of fact to determine whether her opinion applied to the facts separately established.

In her letter of July 12, 2008, Clarkson concluded with the following recommendations:

1. Mr. Mimms should have been warned about the possibility of developing rhabdomyolysis and its potentially fatal outcome,

2. An assessment of Mr. Mimms's fitness to participate in such a stressful exercise session should have been made prior to the training session.

3. Because muscle damage is experienced when exercises are unaccustomed, care should have been taken to ensure that, as a novice to these exercises, Mr. Mimms did not overexert himself. This care should have been manifested by:

    3.1 reducing the intensity of the work out compared to what would be recommended to experienced resistance exercisers. Reducing the intensity means to have fewer repetitions and sets and to include adequate rest periods.

    3.2 observing Mr. Mimms for signs of undue fatigue, such as falling and instability, at which time the exercise session should have been stopped.

    3.3 informing Mr. Mimms to maintain good hydration in days (up to 5 days) following the session and to monitor urine color (providing instructions to go to the emergency room at the first sign of discolored urine). Numbering added.

These are sound recommendations in all physical training, essential in physical conditioning, and they are neither original to Clarkson, nor peculiar to Mimms, nor specific to either CrossFit or military PT. No evidence in the case showed that Mimms did not receive any of these recommendations, nor that any omission was a proximate cause of his illness.

In her conclusion, Clarkson had no recommendation for any exercise regimen, nor warning to exclude CrossFit workouts.

Regardless, the fact of the Mimms' lawsuit, and the facts included in it, are irrelevant to the *Consensus Paper.* The *Paper* relied on Mitchell's account of the trial for this claim that

> physicians and other primary care and rehabilitation providers have identified a potential emerging problem of **disproportionate** musculoskeletal **injury risk**, particularly for novice participants, associated with ECPs (13,16).[66]

First, Clarkson was none of the listed specialists. Second, she testified to certain exercises being known to produce rhabdomyolysis, not as if they were proportionate, but instead as if they were a certainty. Mimms' trial papers incorporated other writings by reference, but Mitchell's article, on which the Consensus relied, did not.

In Clarkson's court paper, above, she falsely alleged,

> It is clear from CrossFit publications (CrossFit Journal issue 38, October 2005 *CrossFit Induced Rhabdo*, authored by Greg Glassman, President and Founder of CrossFit) and CrossFit Journal issue 33, May 2005 "Killer Workouts", authored by Eugene Allen) that CrossFit was aware that their exercise regimens could induce rhabdomyolysis. The October 2005 article described 5 cases of rhabdomyolysis that resulted from participation in a CrossFit training regimen.[67]

CrossFit Induced Rhabdo in its first sentence explains the article is "not only to repeat our warning [in "Killer Workouts"] but to share the lessons we've since learned about 'exertional rhabdo.'" "Killer Workouts" is not about "their exercise regimens" as CrossFit prescribes, but about those exercises **done to excess**:

> Apparently, one of the three CrossFit pillars (functionality, intensity, and variance) done, **in extremis**, can introduce a character to the scene whom we have dubbed "Uncle Rhabdo".[68]

Glassman cited all five known cases "**associated** with CrossFit workouts", not a reference to five cases *induced by CrossFit workouts,* to use the Clarkson revision. These five cases were unauthorized exercise experiments that went beyond any CrossFit prescription.

An expert may testify based on a scientific model or on a statistical model. The scientific model would be able to estimate the stress of a workout, the condition of the athlete, including environmental conditions, and combine the three in formula to predict the outcome using validated Cause & Effect relationships. That is far from the state of the art today in physiology or kinesiology. A statistical model is best based on properly analyzed data, but could be more qualitative based on the experience and opinion of the expert. In either case, statistical models implicitly assume that the underlying, unknown, Cause & Effect relationships are unchanging to make the data from a large number of similar situations applicable. Those data might show the proportions between clinically observed outcomes relative to different combinations of conditions–exercise, athlete condition, environment. No one has accumulated such statistics:

> Accordingly, the evidence-based, peer-reviewed literature does not yet support the efficacy for or clarify any notable injury risk potential with ECPs to validate or dismiss the claims, clinical observations, or media reports.[69]

66 Bold added, *Consensus Paper* p. 383.

67 Clarkson, *id.,* July 12, 2008. See discussion by Mitchell, above.

68 Bold added, *id.*

69 *Consensus Paper,* p. 384.

This statement by CHAMP/ACSM shows that their own claim that health care workers "have identified … disproportionate musculoskeletal injury risk" (P. 383, above) is at best guesswork even in the doctrinaire world of peer-reviewed professional journals.

CrossFit is watching for its first case of even mild exertional rhabdomyolysis that can be attributed solely to a CrossFit workout. Since 2005 and the two CrossFit articles above, the University of Nevada, Reno reports it has conducted 87,000 supervised workouts in its CrossFit gym at the Lombardi Center, and in that time incurring one injury resulting in lost time. That injury must be discounted, however, because it had a major cofactor: the athlete strained an MCL in a box jump, a ligament that had been surgically repaired 36 months earlier.[70]

Clarkson blindly joins Mimms in claiming he was injured by CrossFit workouts, then as an expert links his workout to rhabdomyolysis as if the disease and connection were certain. Lacking any supporting model, scientific or statistical, she converts two CrossFit warnings about rhabdomyolysis into an alleged admission that CrossFit workouts cause lethal rhabdomyolysis.

CrossFit does, of course, induce rhabdomyolysis, recognizing that the disorder is a syndrome that includes the muscle microtears essential to all physical conditioning, damage produced to cause the normal reaction of muscle repair and rebuilding. So does military PT, and to a far greater extent as shown by AFHSC in their Medical Surveillance Monthly Reports. CrossFit rhabdomyolysis has been limited to a few anecdotal cases, mostly abusing CrossFit prescriptions. AFHSC has erroneously reported military rhabdomyolysis increasing at about 150% per year, which on closer examination is more likely close to 7% per year, and at that, far outstripping CrossFit experience. CrossFit is replacing traditional military PT because it produces results, and an ancillary benefit is that CrossFit is far safer.

Clarkson also claims in her paper,

> Mr. Mimms was taking a multivitamin/mineral supplement with added amino acids and other ingredients, none of which have been associated with exertional rhabdomyolysis.[71]

This opinion is in part a tautology, and in part false. Exertional rhabdomyolysis is a differential diagnosis that rules out other causes. However, if the word *exertional* were struck to clear the tautology, the passage would be false.

> Rhabdomyolysis is a rare condition in which muscle cells break down and release a substance into the blood that can lead to kidney failure. Most often, it's seen in people who have suffered major injuries or trauma. **Rhabdomyolysis may also develop in response** to certain medications, **dietary supplements** or drugs. In some cases, rhabdomyolysis may affect athletes such as weight lifters and marathon runners.[72]
>
> The U.S. Food and Drug Administration is warning consumers to immediately stop using Hydroxycut products by Iovate Health Sciences Inc., of Oakville, Ontario and distributed by Iovate Health Sciences USA Inc. of Blasdell, N.Y. Some Hydroxycut products are associated with a number of serious liver injuries. Iovate has agreed to **recall** Hydroxycut products from the market.

70 Constantino, N.L. and J. A. Fitzsimmons, "CrossFit: Menace to Society or the Future of Fitness", ACSM Health and Fitness Summit, March 29, 2012, and private correspondence.

71 Clarkson, July 12, 2008, *id.*, p. 2 of 3.

72 Bold added, Mayo Clinic, *"Variety of Causes Can Be at Root of Rhabdomyolysis"*, October 21, 2011. http://www.mayoclinic.org/medical-edge-newspaper-2011/oct-21b.html

> The FDA has received 23 reports of serious health problems ranging from jaundice and elevated liver enzymes, an indicator of potential liver injury, to liver damage requiring liver transplant. One death due to liver failure has been reported to the FDA. **Other health problems reported include** seizures; cardiovascular disorders; and **rhabdomyolysis**, a type of muscle damage that can lead to other serious health problems such as kidney failure.[73]

Furthermore, Vitamin B12 can cause darkened urine.[74] Discolored urine was a symptom in the Mimms diagnosis of rhabdomyolysis. Mimms, Designation of Expert Witnesses, above, confirmed by Clarkson:

> Two days after the exercise training session, Mr. Mimms experienced severe muscle pain and dark colored urine - both classic signs of rhabdomyolysis. Clarkson (2008) p. 1 of 3.

Clarkson is enforcing ACSM, which is fighting incringement by alien exercise programs. This policy is revealed in its conclusions in the *Consensus Paper.*

> **[Tautology]** Many strengths and weaknesses are inherent to ECPs. **[Compound tautology, scare, passive voice; hypotheticals]** However, a measurable and costly increase in injury risk could arise when ECPs are performed inappropriately, with an anticipated consequent reduction in individual and unit operational and combat readiness when one or more injuries are sustained. **[Tautology]** Warfighters should approach and participate in any ECP with prudence, recognizing the limitations and challenges. **[Encourage but do not permit]** Although innovative approaches to military physical training should be encouraged, it is critical for these approaches to be consistent with accepted exercise prescription guidelines. **[Doctrine according to ACSM]** Military leaders should ensure that their unit's physical training program is aligned with their Service's established and accepted training doctrine, as well as with position statements from recognized authoritative relevant organizations. **[Study controlled by ACSM]** Military leadership, in collaboration with health care providers and other scientifically trained clinical and fitness support personnel, also should responsibly, objectively, and comprehensively monitor and evaluate ECPs and all other conditioning programs to determine their strong points and pitfalls. **[t = ∞]** The aim is to ultimately endorse, refine, or develop new safe, effective, and attractive, evidence-based conditioning strategies and programs for all personnel to meet their occupational and operational demands and expectations. Bold, bracketed comments added, underscoring added, *Consensus Paper,* p. 388.

Clarkson, an officer of ACSM at a policy-making level, relied on her credentials to influence Mimms' lawsuit in keeping with ACSM policy. This was not her first such venture. She reported two previous experiences, but with no references:

> Recently, one of the authors (PMC) was involved as a consultant/expert witness in two legal cases in universities in different states where an exercise protocol using eccentric contractions, which are known to cause muscle damage, resulted in rhabdomyolysis and hospitalization of the research subjects. Sayers, Clarkson, et al., (1999).[75]

73 Bold added, FDA, "FDA Warns Consumers to Stop Using Hydroxycut Products: Dietary Supplements Linked to One Death; Pose Risk of Liver Injury", May 1, 2009. http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm149575.htm

74 Vanholder, R., M.S. Sever, E. Erek, and N. Lameire, "Rhabdomyolysis", J.Am.Soc.Nephrol. 11: 1553-1561, 8/1/2000, p. 1557.

75 Sayers, S.P., P.M. Clarkson, P.A. Rouzier, G. Kamen, "Adverse events associated with eccentric exercise protocols: six case studies", ACSM, Medicine & Science in Sports & Exercise, v. 31(12) December 1999 p 1697, p. 2 of 10.

In Clarkson's letter of July 12, 2008 for Mimms, she remarked that the exercises in the case involved "eccentric contractions", that

> Strenuous eccentric exercises can damage the membrane of muscle fibers and release muscle fiber contents (like proteins and electrolytes) into the bloodstream.

And that

> These exercises emphasize eccentric contractions that are known to produce rhabdomyolysis, especially in those unaccustomed to these exercises.

Clarkson has written frequently about eccentric exercises. However, with Sayers (1999), above, she concluded,

> **It is generally understood that high-force eccentric exercises pose little threat to otherwise healthy individuals with no history of musculoskeletal disease or injury.** However, our laboratory has observed a 3% incidence of extreme responses to high-force eccentric exercise that result in extended decrements in muscle function, pronounced swelling, and greatly elevated CK levels in the blood.[76]

Nowhere does she define "high-force eccentric exercises", nor does she claim that Mimms' exercise was high-force to go with eccentric. According to her research, Mimms exercises, even if deemed "high force", posed "little threat" to him.

Before CrossFit emerged to threaten ACSM's dominant position in the fitness market, Clarkson wrote

> Although numerous cases of exertional rhabdomyolysis have been reported in the literature, these cases mostly involve individuals who were inexperienced exercisers, uneducated in fitness and health principles, dehydrated or heat stressed, taking drugs, ill, or military recruits in basic training.
>
> We report here two cases where individuals, both well educated and experienced in fitness, were encouraged by exercise leaders in a local health club to overexertion during their exercise routine leading to rhabdomyolysis.[77]

"Mostly involve" is casual English that does not survive parsing. The first sentence might mean that the majority of cases had some of the listed cofactors to exertion. As realistic as that would be, the reading is belied by the choice of ***mostly involve*** instead of ***most cases***, and the author's likely intent. On the other hand, the sentence might mean that in every one of the numerous cases, one of the cofactors dominated exertion. This latter possibility has no objective foundation because the state of the art in epidemiology provides no method by which to assign contributory weights to a set of factors and cofactors, as, for example, drugs:exertion:heat = 50:40:10.

In inference is that the authors suggest that in the history of exertional rhabdomyolysis, the principal ultimate cause was rarely the exercise itself. This was reinforced by adding two new cases to the record, cases which happen to add the new cause of high-force eccentric exercises to the list of observed dominating alternatives.

But that was then, and now, since CrossFit, the cause of exertional rhabdomyolysis is the exercise itself.

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76 Bold added, *id.*, p. 6 of 10.

77 Springer, B. L., P. M. Clarkson, "Two Cases of Exertional Rhabdomyolysis Precipitated by Personal Trainers", ACSM, Medicine & Science in Sports & Exercise, 35(9) September 2003 - pp 1499-1502 (Abstract).

3.2.2.5 Other physicians, referenced by Mitchell, do not say what the *Consensus Paper* claims.

Mitchell wrote,

> Several physicians, including Walter Reed Army Medical Center neurophysiologist Lt. Col. Mark Landau, concluded that Mimms suffered severe injuries following his intense CrossFit workout, according to court records.[78]

The court records include Plaintiff's "Designation of Expert Witnesses", July 14, 2008, which listed Jason Koskien, D.O.; Valerie O'Brien, M.D.; Mark E. Landau, M.D.; John Capacchione, M.D.; Jeffrey H. Phillips, M.D.; and Richard S. Meyer, M.D. along with summaries of their testimony and areas of expertise. The *Consensus Paper* cited Mitchell, ref. (16) for the following proposition:

> However, physicians and other primary care and rehabilitation providers have identified a potential emerging problem of disproportionate musculoskeletal injury risk, particularly for novice participants, associated with ECPs (13,16).[79]

Each of Mimms' experts was to testify regarding specifics of his exercise and resulting injury. Plaintiff's promise of expert testimony said nothing about any emerging problem, real or potential, or of the consequences of any of the *Consensus Paper*'s designated ECPs.

Mitchell supports none of what the authors attribute to it.

3.2.3 The *Consensus Paper* relies on an AFHSC Medical Surveillance Monthly Report for information not in the Report.

The *Consensus Paper* claims,

> Muscle strains, torn ligaments, stress fractures, and mild to severe cases of potentially life-threatening exertional rhabdomyolysis are reportedly occurring at increasing rates as the popularity of ECPs grows (4,27).[80]

Reference 4 is AFSCM Medical Surveillance Monthly Report (MSMR), v.17, no. 3, March 2009, pp. 7-9. Neither it, nor any other volume, nor the Tilghman reference (27), below, reports on "muscle strains, torn ligaments, [or] stress fractures". Specifically, pages 7 to 9 refer to "Update: Exertional Rhabdomyolysis among U.S. Military Members, 2009", which says,

> To exclude cases of rhabdomyolysis that were secondary to traumatic injuries, intoxications, or adverse drug reactions, medical encounters with diagnoses in any position of ICD-9-CM: 800-999 "injury, poisoning, toxic effects" (except ICD- 9-CM: 992.0-992.9, 994.3-994.5, and 840-848 **"sprains and strains of joints and adjacent muscles") were excluded** from consideration as "exertional rhabdomyolysis" case defining encounters. Bold added.

78 Mitchell, *id.*, p. 2 of 4.

79 *Consensus Paper,* p. 383, above.

80 *Consensus Paper***,** p. 383.

This volume 17-3 contains four articles on "Motor vehicle-related deaths", "Heat injuries", "Exertional rhabdomyolysis", and "Exertional hyponatremia", none of which addresses strains, tears, or fractures. The articles do not grade rhabdomyolysis as "mild to severe" and include no rhabdomyolysis fatalities. The articles refer to volume 16-3 for additional information, which includes the following:

> In the United States, case fatality with rhabdomyolysis is less than 5% and depends on the nature of the precipitating cause, the severity and clinical effects of co-morbid conditions, and the prior state of health of affected individuals. Most otherwise healthy individuals recover with aggressive hydration and management of metabolic, renal, and systemic complications.[81]

> Also, the diagnosis of "rhabdomyolysis" does not indicate the cause; in turn, it is difficult to discern cases that are "exertional" and/or heat-related from those with other precipitating causes.[82]

While the MSMRs show an epidemic in exertional rhabdomyolysis, neither this volume nor any other, nor the Tilghman reference (27), below, contains any quantifiable data on the growth on which the *Consensus* rely in the popularity of the ECPs, nor specifically on the growth of any aspect of CrossFit.

The authors attempt to link ECPs as a causative factor for the military's cases of exertional rhabdomyolysis fails, unsupported by analysis, by reference, or by any ECP data.

The precepts of science require the authors to have first established a measure of the popularity of, say, CrossFit, then to estimate the cross-correlation function between that measure and the record of illnesses. To support CrossFit as the cause, its measure must be shown to precede the illnesses. To the extent that CrossFit growth lags the disease suggests that other factors are creating a demand from the military for better conditioning. To the extent that the two measures are correlated with neither leading the other suggests a common cause for both. A candidate cause that meets these technical requirements is the Global War on Terror, as shown in Part I.

3.2.4 The *Consensus Paper* relies on a news article by Tilghman whose source appears to be the authors of the *Consensus Paper.*

Tilghman, reference 27, is an Air Force Times staff writer who wrote about "The hidden danger of extreme workouts: Intense regimens are all the rage, but fitness experts have concerns".[83] He wrote,

> Many on-base gyms have CrossFit trainers on staff, and most military towns now have a gym dedicated to the CrossFit exercise methodology. Units are adopting CrossFit as their PT program–because it gets results.

> "During the time that I have been using CrossFit on a regular basis, I have been and am currently in the best shape of my life" at age 33, wrote Army Capt. Robert Pettigrew, and that sentiment was echoed in many similar e-mails.[84]

81 MSMR, v. 16-3, p. 10.

82 MSMR 2009 v16-3, p. 13.

83 Air Force Times, 9/30/2010. It is *Consensus Paper* ref. (27).

84 Tilghman, "Hidden danger of extreme workouts", September 30, 2010.

The total of his support is an unquantified observation about the presence of CrossFit in military gyms plus a single testimonial. He uses the terms "high intensity" and "extreme" with no objective standards.

To introduce a recent conference, Tilghman begins

> But as the popularity of CrossFit and other high-intensity fitness programs has grown, so have concerns about their safety. [¶] Some troops are reporting injuries serious enough to land them in the hospital, and the military wants to take a formal look at all of the so-called "high-intensity training" programs and their impact on force fitness and readiness.

This is the unscientific claim repeated in the *Consensus Report:* the writers' subjective perception of correlation in injuries and ECP popularity suggests causation. That correlation does not establish causation is trite. That correlation can only suggest where cause might lie is true even when the correlation is rigorous, that is, measured and objective. Here the *Consensus* claims a subjective correlation–CrossFit and ECP popularity growing vs. concerns about ECP safety and phantom injuries on the rise. The safety concerns are, as the *Consensus Paper* says, the authors' opinion. The alleged injuries are from "[s]ome troops" and undocumented. AFHSC Medical Surveillance Monthly Reports on which the authors rely are silent on "strains, torn ligaments, [or] stress fractures" and warn that their rhabdomyolysis data is the *Paper*'s "potentially life-threatening rhabdomyolysis" but merely "presumed rhabdomyolysis", as shown in Figure 1, above.

Nonetheless, the writers urge their subjective notions are evidence of a Cause & Effect sufficient to warrant "a formal look". The formal look will fail to resolve their subjective expectations. Any objective study will confirm what is given in the textbooks, revealed by the data, and well-known to the Warfighters who are demanding CrossFit instead of ACSM-endorsed military PT. A one size fits all program for group conditioning standards produces higher injury rates and lower readiness than does an individualized program for maximal fitness.

Continuing, Tilghman says,

> Dozens of military doctors and fitness experts attended a conference in September at the Uniformed Services University of the Health Sciences outside Washington, D.C., to talk about programs such as CrossFit , P90X, Insanity and other off-the-shelf commercial exercise programs.
>
> "The reason we're here is because of all the anecdotal reports of injuries," said Col. (Dr.) Francis O'Connor, associate professor of military and emergency medicine at the university.[85]

This passage establishes first that the reports of ECP-induced injuries are anecdotal, meaning **scientifically unreliable.** Tilghman further undermines the urgings of the *Consensus* by saying

> But the Pentagon is worried that there is insufficient evidence to back up such assertions. [¶] "There's no research on these programs," physiology professor William Kraemer said at the Sept. 13 USUHS conference.

Professor Kraemer is a member of the *Consensus*.

Secondly, Tilghman establishes in the preceding quotation that his authority is none other than the Medical Director for CHAMP, who, like Kraemer, is a co-author of the *Consensus Paper.* The *Paper*'s reliance on this Tilghman piece is a self-reference, a bootstrap. Tilghman's sources are the authors of the *Consensus Paper.*

85 Tilghman, *id.*

3.2.4.1 CrossFit Is Safer than Traditional PT.

Tilghman further undercuts the *Consensus Paper,* saying

> [Greg] Glassman addressed safety concerns in an e-mail to Military Times. [¶] "CrossFit is safer, more efficient, and more effective than the physical training it replaces," he wrote.

If this were a defendant's claim in answer to *Consensus* accusations, it, too, would have been a bootstrap by implication (neither CrossFit nor Greg Glassman was a defendant). But by referencing Tilghman, *Consensus* concedes authority to the article. Tilghman shows that whatever the founder of CrossFit says about its dangers or misuse, it is opinion within the context of the belief that it is the safest of all programs, including no fitness training at all. Indeed, immobility is a cause of compartment syndrome and rhabdomyolysis.[86]

3.3. The *Consensus Paper* confesses that its subject is not ripe for academia.

> Accordingly, the evidence-based, peer-reviewed literature does not yet support the efficacy for or clarify any notable injury risk potential with ECPs to validate or dismiss the claims, clinical observations, or media reports. *Consensus Paper,* p. 384.

Richard Horton, MD, editor, The Lancet (2000), provides a response:

> The mistake, of course, is to have thought that peer review was any more than a crude means of discovering the acceptability - not the validity - of a new finding. Editors and scientists alike insist on the pivotal importance of peer review. We portray peer review to the public as a quasi-sacred process that helps to make science our most objective truth teller. But we know that the system of peer review is biased, unjust, unaccountable, incomplete, easily fixed [*jiggered, not repaired*], often insulting, usually ignorant, occasionally foolish, and frequently wrong.[87]

Science nonetheless demands evidence. Scientific knowledge is a mapping from facts to future facts through Cause & Effect. Where the facts are incomplete, the model is but a conjecture. In Modern Science, the predictive power of models trumps any matters of publication of consensus.

The peer-review criterion is peculiarly academic, a tenet of Post Modern Science and now the Law in the US federal courts[88], and unrelated to Modern Science. It is not a criterion in the military, nor in industry, except where regulation and legal technicalities demand it.

Search where objects might repose, not necessarily where the light appears brightest.

86 Vanholder, R., et al, "Rhabdomyolysis", J.Am.Soc.Nephrol. 11:1553-1561, 2000. Also, see Danzl and Lloyd, ¶4.5.1, below.

87 http://en.wikipedia.org/wiki/Richard_Horton_%28editor%29

88 See Daubert v. Merrill Dow, 509 US 579, for the five criterion, all derived from Karl Popper's writings, four accepted by the Court for the standard of scientific knowledge, and one explicitly rejected.

PART 4

PART 4: APPENDIX. TEXTBOOKS ON MILITARY MEDICINE, SELECTED EXCERPTS AND FACTS

The Textbooks on Military Medicine (TMM) is an online series promulgated by the US Army Medical Department, Borden Institute.

4.1. Vogel, J.A., and J.F. Patton, "Physical Fitness and Physical Training for Military Performance", TMM, Rehabilitation of the Injured Combatant, v. 2, (1999) Ch. 13.

4.1.1 Fitness is work capacity.

"Thus, we define and use the term physical fitness as the ***energy generating capacity*** *to perform physical effort."* Original italics, bold added, p. 782. That energy is applicable because

"the military profession remains physical in nature. Considerable emphasis is placed on physical training, physical capacity, and ultimately, on physical readiness, regardless of the specific role or occupation that the service member may fill. Irrespective of peacetime or wartime, service members must be prepared to defend themselves and others about them, and to react to emergencies as they may occur. … [¶] … Individual members must possess the stamina and strength to perform successfully **any potential mission**. These qualities, together with weight control, form the basis of the DoD physical fitness program." Bold added, Vogel, id., p. 782.

Energy and work are manifestations of the same parameter, and so share common dimensions. Work is action to change energy, and energy is the capacity to do work, as in kinetic, including thermal, or potential energy. Work is the exchange of energy, as in Earth's collisions with asteroids or its warming from the one true source, the Sun, or the application of force through distance to change the energy of bodies.

Compare this definition with the CrossFit definition:

> Our very public and constant claim is that fitness is best defined as work capacity across broad time and modal domains… .[1]

> At each duration, we average your power capacity across a variety of modal domains (skills and drills). This creates a power curve, the area under which is your work capacity across broad time and modal domains (aka fitness).[2]

1 Coach, Comment #62, November 8, 2008. http://board.CrossFit .com/showthread.php?p=441535

2 Glassman, G., "CrossFit's New Three-Dimensional Definition of Fitness and Health–1", February 21, 2009. http://journal.CrossFit .com/2009/02/CrossFit s-new-definition-of-fitness-volume-under-the-curve-1.tpl

4.1.2 Intensity is power, or perhaps speed.

"If an individual runs at the level of his maximum oxygen consumption (VO2max), that exercise intensity can only be maintained for 5 to 10 minutes after which he must stop or reduce the intensity level, again referred to as a loss in capacity or fatigue." Vogel (1999) p. 786.

4.1.3 Cells generate power from three metabolic pathways.

Energy is released from a continuum of three overlapping metabolic processes, immediately through the phosphagen system, in the short-term (on the order of 10 to 180 seconds) through anaerobic glycolysis, and in the longer term through the aerobic system.

> *"The Energy Continuum of Exercise*
> "Figure 13-7 illustrates the relative contribution of the three energy sources during various durations of exercise." Vogel, *id.*, pp. 787-788.

4.1.4 Power capacity is a matter of individualized conditioning.

"Therefore, the relative contribution of the body's various means for energy transfer can differ markedly, depending on **the intensity and duration of exercise, and the power capacity (fitness) of the participant.**" Bold added, id., p. 787.

Vogel switches fitness from energy to power.

4.1.5 Intensity is energy.

"Physical activities of short duration and high intensity, where the power developed by the exercising muscle is near or at maximal level, require an immediate and rapid supply of energy." Vogel (1999) p. 787.

The consequence of high (here maximal) power must be from high energy for a short duration, not high load for a short duration. Pounds per second is mass flow, not power.

4.1.6 Intensity has meaning in context with duration and frequency.

> "Training Principles
> "*Overload*
> "To achieve an adaptation or ability to handle greater amounts of exercise, the body must be challenged with a load greater than that to which it is accustomed. **By exercising at a level above "normal" (overload), the body responds physiologically to accommodate this greater load until that load becomes the norm.** The overload must be presented progressively and with sufficient intervening recovery time to avoid damage or failure to the systems involved. The added load can be presented by increasing the **intensity, duration, or frequency** of the training activity. ***Intensity* refers to the absolute level of exercise (strength of the stimulus), such as speed of running or the amount of mass lifted.** Load can also be modified by adjusting the ***duration*** of the training bout (minutes that the stimulus is applied) and by the *frequency* (bouts of training per week) of training. Frequently, a combination of intensity, duration, and frequency are used over the course of a formal training program to produce a training overload. Application of these three methods of load adjustment will be discussed at the end of this section.
> *"Progression …*

"For optimum results, **training progression should be individualized**. . .". Bold added, footnote deleted, *id.,* p. 807.

A better measure of intensity in running would be distance as opposed to speed. Speed is derived from distance by the independent parameter of duration.

4.1.7 Conditioning entails muscle damage and repair.

Physical training is the activity of overloading the body's systems to bring about adaptive responses that permit the handling of increased loads with less strain and stress, individualized for the body type and conditioning to avoid detraining or overtraining, with varying intensity, duration, and frequency to challenge each of the three metabolic processes. "The adaptive response appears to have two components; (1) an initial one of depletion or **breakdown**, which in turn, triggers (2) **rebuilding and super repletion** . . . ." Vogel, id., p. 807, 808.

4.1.8 Fitness extends over broad time and modal domains.

The "gain resulting from a training program depends on the ***mode*** [e.g., 'running, cycling, swimming, rowing'] ***and extent*** of the stimulus which is applied." Original italics, bold added, Vogel, *id*., p. 810.

4.1.9 Training maintains what conditioning creates.

"Training … to achieve general fitness and health should be perpetual." Vogel, *id*., p. 811.

4.1.10 Fitness has an economy.

"Greater gains can be achieved by training up to five times weekly, but this must be weighed against time requirements for other training activities and the potential cost in increased injuries." Vogel, *id.*, p. 812.

4.1.11 Training must stress all three domains.

"The objective of most military physical training programs is to achieve and maintain fitness in all three categories of exercise capacity: aerobic, strength, and muscular endurance. The next step is to develop a mix of activities during the week to train all three categories." Vogel, *id.,* p. 813.

4.1.12 Exertional rhabdomyolysis results from trainer miscalculation of individual conditioning coupled with environmental stress.

"Exertional Rhabdomyolysis [¶] Acute rhabdomyolysis is a condition that has historically been related to military recruit physical training. This injury syndrome is characterized by myoglobinuria, muscle pain, weakness, and soreness. It occurs with the sudden onset of intense or excessive exercise, a situation that has previously been common in military recruit training. It **can be prevented by a graduated program of exercise intensity in those recruits who are unfit or inactive**. Severe rhabdomyolysis can have fatal consequences if it progresses to renal failure secondary to marked myoglobinuria and tubular necrosis. In 1988, cases of death and hospitalization due to exertional rhabdomyolysis (brought on by inappropriately sudden and intense physical training) were reported in police trainees in New York City and the state of Massachusetts." Bold added, footnotes deleted, Vogel, *id.*, p. 818.

4.2. Gardner, J. W., and J.A. Kark, "Clinical Diagnosis, Management, and Surveillance of Exertional Heat Illness", TMM, Medical Aspects of Harsh Environments, v. 1 (2002).

4.2.1 Exertional rhabdomyolysis is difficult to impossible to diagnose in individual cases.

"Exertional heat illness (EHI) encompasses a **spectrum of disorders** deriving from the combined stresses of exertion and thermoregulation. These include exertional dehydration, heat cramps, heat exhaustion, heat injury, heat stroke, **rhabdomyolysis**, acute renal failure, and hyponatremia. Early in the course of EHI it may be **difficult or impossible to distinguish** these entities and, in fact, they often overlap and are differentiated as the clinical manifestations evolve. They represent primarily a **continuum of multisystem illnesses** related to elevation of body core temperature and the metabolic and circulatory processes (including changes in fluid and electrolyte balance) that are brought about by exercise and the body's thermoregulatory response." Bold added, Gardner, *id.*, p. 232.

4.2.2 Mild to severe rhabdomyolysis is equivalent to intermediate to severe Exertional Heat Illness.

"We include all of the exertion-related heat illness syndromes within the term EHI. These **syndromes** form a continuum of multisystem illnesses, which may be divided into three main levels:

1. *Mild* EHI, which includes heat exhaustion, mild dehydration, and heat cramps;

2. *Intermediate* EHI, which includes exertional heat injury and **mild rhabdomyolysis**, renal insufficiency, orthostatic hypotension, heat-related syncope, and reversible electrolyte and metabolic disturbances; and

3. *Severe* EHI, which includes heat stroke, **severe rhabdomyolysis**, liver necrosis, acute renal failure, cardiovascular collapse, and marked electrolyte or metabolic disturbances." Bold added, italics original, Gardner, *id.*, p. 233.

4.2.3 Severe rhabdomyolysis includes life-threatening complications.

Gardner, *id.,* Exhibit 7-1, Clinical Features of Exertional Heat Illness, p. 234.

4.2.4 Exertional rhabdomyolysis is a problematic diagnosis in an individual case because of the large number of possible and unknowable cofactors or alternative causes.

"The differential diagnosis of symptoms associated with EHI is broad and varies with locality and time. Most of the clinical findings associated with EHI are also found in other diseases. These diseases may provoke or accompany EHI, thus increasing the severity of the illness and the risk of serious complications. Infectious diseases are likely to provoke EHI by contributing to dehydration and hyperthermia. It is particularly important to consider meningitis, sepsis, pneumonia, myocarditis, viral infections, asthma, drugs and toxins, sickle cell disease, and cardiovascular or cerebrovascular disease. The differential diagnosis list for patients with high body temperature also includes malaria, Rocky Mountain spotted fever, other infections, anticholinergic poisoning, neuroleptic malignant syndrome, and thyroid storm." Citations deleted, Gardner, p. 235.

4.2.5 Exertional rhabdomyolysis is a syndrome caused by the release of the contents of skeletal muscles.

"Exertional rhabdomyolysis is the syndrome caused by skeletal muscle damage with release of cellular contents into the circulation, including myoglobin, potassium, phosphate, creatine kinase (CK), lactic acid, and uric acid. Manifestations of rhabdomyolysis can vary from asymptomatic elevation of serum skeletal muscle enzymes to muscle weakness, pain, tenderness, and stiffness with associated myoglobinuria with or without acute renal failure. In its most severe form obvious muscle necrosis can be demonstrated, but marked laboratory abnormalities can occur without extensive cell necrosis. Severe rhabdomyolysis may present without early muscle pain or tenderness, and muscle numbness may be the only symptom in the first few hours (documented in approximately one third of severe cases)." Citations deleted, Gardner, *id.*, p. 240.

4.2.6 Individuals can maintain good hydration by keeping their urine volume, color, and density at normal levels.

"Each individual must be responsible to maintain adequate water intake, which requires drinking when not thirsty and monitoring urinary volume and color, weight changes, and so forth. Individuals must be aware of the need to hydrate ahead of thirst and before and during exercise." Gardner, *id.*, pp. 259-260.

4.2.7 A cluster of rhabdomyolysis cases can provide a statistical solution to the differential diagnosis dilemma.

"Monitoring of cases and medical outcomes involves assessment of triage and immediate care by an assigned acute care or surveillance officer. Each case must be reviewed and classified as to type and severity, with attention given to risk factors and training circumstances. Patterns of illness and relation to training activities can then be evaluated and trends analyzed. **Clusters of cases can be explored to determine the specific circumstances that have produced these casualties.**" Bold added, Gardner, *id.*, p. 261.

4.3. Cowan, D. N., B. H. Jones, and R.A. Shaffer, "Musculoskeletal Injuries in the Military Training Environment", TMM, Medical Aspects of Harsh Environments, v. 1 (2002).

4.3.1 Running is a predictor of physical injuries.

"Military training usually involves substantial amounts of running and marching. Some aspects of training, particularly running, are associated with increased risks of overuse injury." Cowan, *id.*, p. 197.

Part of the problem with running is the group cross-country run or march where the trainees are coerced to keep up, and committed to the return at the half-way point.

4.3.2 Annual heat-related injuries amount to about one eight-hundredth of total exercise related injuries.

"Among Army and Marine Corps **trainees**, rates of outpatient visits due to injuries of 20% to 40% per month have been observed, and rates of 20% per month have been reported among trained infantry soldiers." Bold added, Cowan, *id.,* p. 197.

MSRM reports heat-related injuries for all active components of the US armed forces. In 2011 they were 362 for heat stroke (0.25 per 1,000 person years), 2,652 for "other heat injury" (1.82 per 1,000 person years), and 435 for rhabdomyolysis (29.9 per 100,000 person years). Medical Surveillance Monthly Report (MSRM), Armed Forces Health Surveillance Center (AFHSC), v. 19, no. 3, March 2012. The rates are for all active duty components of the U.S. armed forces.

Cowan's data for exercise-related injuries are monthly rates, so annual rates are 12 times greater. Using the lower of Cowan's rates and the total active duty population of 1.45 million derived from the 2011 MSMR report, the ratio of heat-related injuries to total exercise-related injuries is 1:805. By categories of EHI, the ratio is 1:6,385 for presumed exertional rhabdomyolysis, 1:7,673 for heat stroke, and 1:1047 for "other heat injuries".

4.3.3 Between 16% and 45% of military trainees will suffer an exercise-related injury each month, more than two orders of magnitude more common than EHI.

"Numerous studies of military trainees have documented the high risk of exercise-related injuries, ranging from 14% to 42% among men and from 27% to 61.7% among women. Most injuries are to the lower extremities, and most of these are overuse injuries." Citations deleted, Cowan, *id*., p. 198.

The number of males in the armed forces is 1.25 million and the number of females is 0.21 million, numbers derived from 2011 MSMR illness rates. *Id.* With these rates, Cowan's total injury rates for both sexes are between 15.9% and 44.8% per month.

4.3.4 Knee injuries rank third among injuries to male trainees.

"The types of injuries experienced by military populations have been examined in several studies. Jones and colleagues found that pain due to overuse was diagnosed in 24% of male trainees, muscle strains in 9%, ankle sprains in 6%, overuse {199} **knee injuries in 6%,** and stress fractures in 3%." Footnote deleted, bold added, Cowan, *id*., pp. 198-199.

The data are ambiguous, and Jones, et al., is not available online. The four categories appear to account for the 24% of injured male trainees, and knee injuries are third in prevalence.

4.3.5 Active duty statistics are available from the US Army.

In 1994, the Army experienced 350 deaths, 4,500 disabilities, 20,000 hospitalizations, and 400,000 sick-call visits among active duty personnel, a ratio of 1:15:60:1100. Cowan, *id*., p. 199.

4.3.6 Exercise injury rates depend on body type.

"In US Marine Corps trainees, males diagnosed with stress fractures were shorter, lighter, and smaller in most bone structural girth dimensions than were uninjured trainees. In addition, bone structural geometric properties, such as cross-sectional areas, moments of inertia, section moduli, and width, were significantly smaller in those with stress fracture." Cowan, *id.,* p. 201.

4.3.7 Infrequent exercise and not the work expended leads to injury.

"Exercise frequency less than 1 day per week (RR[3] = 1.5) was a significant predictor, but investigator-estimated energy expended per week in exercise (based on the reported intensity of exercise) was not associated with risk of injury." Cowan (2003) p. 202.

Note that Cowan equates intensity with work (energy), which is neither power nor force (load, weight) nor distance.

4.3.8 Fitness reduces injury risk.

"Past physical activity and preexisting physical fitness are both important predictors of risk of training injury, and this is reflected in repeated findings that persons who enter military service with a history of high levels of activity and fitness are at significantly lower risk of injury. There are several health-related parameters of fitness, including cardiorespiratory endurance, muscle endurance, strength, flexibility, and body composition." Citations deleted, Cowan, ***id.,*** p. 202.

4.3.9 Exercise as infrequent as once a week is a predictor of injury.

"Exercise frequency less than 1 day per week (RR [relative risk] = 1.5) was a significant predictor, but investigator-estimated energy expended per week in exercise (based on the reported intensity of exercise) was not associated with risk of injury." Cowan, *id.*, p. 202.

4.3.10 Running injuries are a measure of lack of fitness.

"Based on the available evidence, it appears that endurance (as measured by run times) is the best fitness predictor of injury, with risks substantially higher among the worst performers." Cowan, *id.*, p. 202.

4.3.11 The rate of change of training predicts injuries.

"Training itself has been identified as a risk factor for injuries. Rapid increases in the amount and intensity of training are postulated to be associated with increased levels of injury. … [¶]… As with any physical training program, the **frequency, intensity, duration, and type of activity** must take into account the physical condition of the trainees entering the program to prevent 'training error,' which increases the risk of injury. Military trainees who enter service with a history of being physically active are at reduced risk of injury, while those who have been more sedentary, and thus experience a rapid acceleration in activity when they enter the military, are at significantly higher risk of injury. These populations must have gradual and appropriate 'ramp-up' of physical activity with adequate rest included." Citations deleted, Cowan, *id.*, p. 205.

4.3.12 Training injuries are the cost for the payoff of reduced active-duty injuries.

"Injuries in general, and training related injuries in particular, are a major cause of morbidity, lost duty time, and financial costs to the military. … Several modifiable risk factors have been identified, including physical fitness, cigarette smoking, and fitness training. It is known that training programs can be modified to prevent injuries yet still produce physically fit soldiers, sailors, airmen, and marines." Cowan, *id.*, p. 207.

3 RR stands for Relative Risk, defined as the ratio of the probability of an event in an exposed population to the probability of that event in a non-exposed population.

4.4. Walsh, J.J., and S.M. Page, "Rhabdomyolysis and Compartment Syndrome in Military Trainees", TMM, Medical Aspects of Harsh Environments, v. 1 (2002).

4.4.1 All basic training produces muscle injuries.

"All basic trainees, to some degree, experience muscle injury below the threshold of permanent damage." Walsh, *id.,* p. 166.

4.4.2 Urine darkens as serum myoglobin exceeds 100 mg/dL.

"Normally, myoglobin is not detected in the blood until levels exceed 1.5 mg/dL, an amount equal to the dissolution of approximately 100 g of skeletal muscle. After injury, however, myoglobin concentrations rise in the plasma. Myoglobin is then excreted in the urine as concentration exceeds 21 mg/dL. When plasma concentration rises above 100 mg/dL, urine quickly turns a dark color." Footnote deleted, *id.*

4.4.3 Rhabdomyolysis and compartment syndrome are closely related.

"The purpose of this chapter is to highlight two closely related problems that occur within the training environment: rhabdomyolysis and compartment syndrome. These conditions develop as a result of a physiological cascade of metabolic abnormalities that occurs when the body is no longer able to compensate for the demands placed upon it." *Id.*

4.4.4 Exertional rhabdomyolysis is commonplace, but requires differentiation from other factors.

"Current studies recognize that, among a wide range of individuals, acute exertional rhabdomyolysis is a fairly common complication of strenuous physical activity. This condition has been documented in military recruits, professional and amateur athletes, weight lifters, firefighter trainees, and law enforcement trainees. Olerud et al [1976] found that, during the early training phase, 40% of 337 military recruits had myoglobin in their urine, which is evidence of rhabdomyolysis. Line and Rust [1995] described a study of 50 law enforcement trainees who had levels of creatine phosphokinase consistent with rhabdomyolysis. In a study by Sinert et al [1994], nearly half of the hospital admissions for rhabdomyolysis were exercise induced. The common theme present in these studies is that the participants exerted effort above their usual maximum effort. For physically unconditioned recruits entering training, the increased level of activity may actually be quite modest. There are numerous examples, however, of well-conditioned athletes (e.g., marathon runners) who developed some degree of rhabdomyolysis after a supramaximal exercise session. … Muscle pain, weakness, swelling, and burning in the involved extremity are common complaints, as well as a history of voiding dark urine. Critical information to elicit from the patient includes noting the environment and circumstances when the injury occurred; the hydration status; a history of sickle cell trait; and use of any medication, laxative, or supplement. If an herbal medication has been used, a sample is needed by the physician to check for ingredients such as caffeine, aspirin, ephedrine.

"Findings on physical examination consist of muscle swelling, tenderness, and edema. The muscles involved may be quite isolated, such as the pectoralis major or the triceps. Neurological function is usually normal." Footnotes deleted, Walsh, *id.,* pp. 166-167.

4.4.5 Compartment syndrome cannot assist in the differential diagnosis of exertional rhabdomyolysis because rhabdomyolysis itself can cause edema and compartment syndrome.

"Compartment syndrome is a painful condition in which increased pressure within a muscle compartment causes a decrease in blood supply to the affected muscles, and it can present in a variety of ways. Because of the potentially catastrophic consequences if left untreated, it is important to recognize it promptly. Compartment syndrome reflects ischemia at the cellular level. Basically, it **occurs when an inciting event produces edema within a muscle compartment. Causes include blunt trauma, fractures, burns, muscular exertion, or muscle swelling and edema (such as that occurring with rhabdomyolysis).**" Walsh, *id.,* p. 169.

4.4.6 Acute exertional rhabdomyolysis is a spectrum of symptoms usually requiring no more than rest, but requiring differentiation from about 100 known causes and cofactors.

"Acute exertional rhabdomyolysis exists as a spectrum of physiological changes that might develop after excessive exercise. The extent to which systemic and renal toxicities develop is dependent on various cofactors, including baseline fitness, recent weight loss, hydration status, viral illness, stimulant use, and the presence of sickle cell trait. Prompt recognition and aggressive treatment usually prevent serious complications. Military personnel usually recover without ill effects after treatment, rest, and a gradual return to activity." Walsh, ***id.***, p. 173.

Alternative causes of rhabdomyolysis or cofactors of exercise rhabdomyolysis to be differentiated include the following. Source: Craig, S., "Rhabdomyolysis", eMedicine Specialties, Emergency Medicine, Trauma and Orthopedics, August 14, 2008, footnotes deleted. Craig shows the etiologies divided into traumatic, exercise induced, toxicologic, environmental, metabolic, infectious, immunologic, and inherited classifications (numbering added):

4.4.6.1 Rhabdomyolysis may occur after traumatic events, including:

1. Significant blunt trauma or crush injury
2. High-voltage electrical injury
3. Extensive burns
4. Near drowning
5. Prolonged immobilization (e.g., after excess alcohol or drug consumption, after an unwitnessed incapacitating stroke, following prolonged surgical procedures)

4.4.6.2 Rhabdomyolysis may occur after excessive muscular activity, such as:

6. Sporadic strenuous exercise (e.g., marathons)
7. Status epilepticus
8. Status asthmaticus
9. Severe dystonia
10. Acute psychosis
11. Excessive computer keyboard use

4.4.6.3 Toxin-mediated rhabdomyolysis may result from substance abuse, including abuse of:

12. Ethanol
13. Methanol
14. Ethylene glycol
15. Isopropanol
16. Heroin
17. Methadone
18. Barbiturates
19. Cocaine
20. Amphetamine
21. Phencyclidine
22. 3,4-methylenedioxymethamphetamine (MDMA, ecstasy)
23. Lysergic acid diethylamide (LSD)

4.4.6.4 Toxic-mediated rhabdomyolysis may result from prescription and nonprescription medications, including:

24. Antihistamines
25. Salicylates
26. Caffeine
27. Fibric acid derivatives (e.g., bezafibrate, clofibrate, fenofibrate, gemfibrozil)
28. Neuroleptics
29. Anesthetic and paralytic agents (the malignant hyperthermia syndrome)
30. Amphotericin B
31. Quinine
32. Corticosteroids
33. Atorvastatin
34. Fluvastatin
35. Lovastatin
36. Pitavastatin (marketed in Japan, South Korea, India)
37. Pravastatin
38. Rosuvastatin
39. Simvastatin
40. Cerivastatin (recalled from US market)
41. Theophylline
42. Cyclic antidepressants
43. Selective serotonin reuptake inhibitors (the serotonin syndrome)
44. Aminocaproic acid
45. Phenylpropanolamine (recalled from US market)
46. Propofol (continuous infusion)

4.4.6.5 Rhabdomyolysis may be caused by other toxins, including:

47. Carbon monoxide
48. Toluene
49. Hemlock herbs from quail (rhabdomyolysis after the consumption of quail is well known in the Mediterranean region; it occurs as the result of intoxication by hemlock herbs that the quails consume.)
50. Snake, spider (e.g., black widow spider), and massive envenomations of Africanized honey bees

4.4.6.6 Environmental causes of rhabdomyolysis include:

51. Hyperthermia
52. Hypothermia

4.4.6.7 Metabolic causes of rhabdomyolysis include:

53. Hyponatremia or hypernatremia
54. Hypokalemia
55. Hypophosphatemia
56. Hypothyroidism or hyperthyroidism
57. Diabetic ketoacidosis
58. Nonketotic hyperosmolar diabetic coma

4.4.6.8 Viral infectious disease agents may cause rhabdomyolysis, including:

59. Influenza types A and B (most common)
60. HIV
61. Coxsackievirus
62. Ebstein-Barr virus
63. Echovirus
64. Cytomegalovirus
65. Adenovirus
66. Herpes simplex virus
67. Parainfluenza virus
68. Varicella-zoster virus
69. West Nile virus

4.4.6.9 Bacterial infectious agents may cause rhabdomyolysis, including:

70. Francisella tularensis
71. Streptococcus pneumoniae
72. Group B streptococci
73. Streptococcus pyogenes
74. Staphylococcus epidermidis
75. Escherichia coli
76. Borrelia burgdorferi
77. Clostridium perfringens
78. Clostridium tetani
79. Viridans streptococci
80. Plasmodium species
81. Rickettsia species
82. Salmonella species
83. Listeria species
84. Legionella species
85. Mycoplasma species
86. Vibrio species
87. Brucella species
88. Bacillus species
89. Leptospira species

4.4.6.10 Fungal infectious agents may cause rhabdomyolysis, including:

90. Candida species
91. Aspergillus species

4.4.6.11 Causative connective tissue diseases that can cause rhabdomyolysis include:

92. Polymyositis
93. Dermatomyositis

4.4.6.12 Inherited disorders may cause rhabdomyolysis, including:

94. Enzyme deficiencies of carbohydrate or lipid metabolism
95. Myopathies

4.4.6.13 Rhabdomyolysis also has been reported in patients with sickle cell anemia and has mistakenly been identified as a pain crisis.

To this list might be added Haff Disease, which is rhabdomyolysis developed from the ingestion of certain fish, including buffalo fish, burdot, eel, and pike. The cause is an unknown toxin, but may be thiaminase, which degrades to thiamine (vitamin B1). Wikipedia, Haff disease. Entry 6 for "sporadic strenuous exercise" contains within its vague, relative boundaries the athlete who is unprepared or de-conditioned, or who adds to a maximally designed conditioning program intense outside activities such as manual labor or sport.

4.5. Danzl, D.F. and E.L. Lloyd, "Treatment of Accidental Hypothermia", TMM, Medical Aspects of Harsh Environments, v. 1 (2002) Ch. 16.

4.5.1 Immobility induced rhabdomyolysis.

In situations of enforced immobility, extremities may develop compartment syndromes after perfusion is reestablished in frostbitten (i.e., frozen) extremities. Danzl, *id.*, p. 498.

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Road to the Top 10

Former all-American volleyball player and Olympic weightlifter Lindsey Valenzuela went from 34th at last year's Games to ninth this year—and she has bigger goals in 2013. Andréa Maria Cecil reports.

By Andréa Maria Cecil **September 2012**

All images: Staff/CrossFit Journal

In July, Lindsey Valenzuela finished the CrossFit Games in ninth place, jumping 25 spots from 2011 and meeting her goal of making the top 10 in 2012.

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"It was an amazing arc in a year," said her coach, Dusty Hyland. "She climbed the ladder and the competition got stiffer. For her, we've seen a lot of growth as an athlete on a mental level, on a competitive level and on a physical level, which is good—that's what we're looking for as coaches."

> "If we can make the kind of gains we did next year that we did this year, she'll be in the top five."
>
> —Dusty Hyland

Valenzuela finished this year's Games one spot ahead of Becca Voigt, who took bronze last year. And she finished five places behind Kristan Clever, the 2010 Games champion who placed second in 2011. Like Valenzuela, Clever and Voigt train at Valley CrossFit in Van Nuys, Calif.

"I was extremely happy," Valenzuela said. "I knew what I wanted to accomplish. I knew that I wanted to finish every workout and I knew I wanted to make it to the third day. And I knew it was a possibility to make it in the top 10."

She added: "I didn't doubt myself."

In the Games' two-part opening event at Camp Pendleton—a swim-bike-run two days earlier than athletes anticipated—Valenzuela placed 12th in Pendleton 1 and 21st in Pendleton 2. It was a more-than-respectable finish for an athlete who had focused on strength for much of her career.

"Coming from a weightlifting background, that's huge," Hyland said. "If we can make the kind of gains we did next year that we did this year, she'll be in the top five."

Volleyball, Oly and CrossFit

As a collegiate volleyball player, Valenzuela began performing the Olympic lifts as part of her sport-specific training. The explosive snatch and clean and jerk proved useful in improving her game at California Lutheran University, where she was a three-year all-American.

Valenzuela showcased her improved gymnastics skills on the parallette handstand push-ups, a movement that challenged many Games athletes.

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She can also snatch 195 lb.

In her junior year, Valenzuela—then known by her maiden name, Benson—made the All-Conference First Team. In her senior year, she earned spots on the American Volleyball Coaches Association All-American Second Team, the association's West Region First Team and the All-Southern California Intercollegiate Athletic Conference First Team.

As of 2010, Valenzuela's 127 career aces were the third highest in Cal Lutheran's history and were the second highest total of the decade. As a setter, Valenzuela led the college to 44 wins in two seasons. After she graduated—in June 2010—she was named to the school's Volleyball 2000-09 All-Decade Team.

Valenzuela had already begun competing in Olympic weightlifting in 2006, just after her freshman year at Cal Lutheran. She found CrossFit three years later as she was ending her volleyball career. Mere months later, she qualified for her first CrossFit Games Regional. But it wasn't until 2011 that Valenzuela qualified for the Games.

"It's been pretty interesting because I sure remember going with her to the 2010 Sectionals … and she didn't have chest-to-bar pull-ups. And the next year she went to Regionals, she didn't have muscle-ups," said her husband, Arsenio. "It seemed like this year it was a culmination of the last three and a half, four years of work."

One of the biggest changes from 2011 and 2012 was Valenzuela's coach.

The two met at the 2011 Southern California Regional, where Hyland spoke to Valenzuela after she didn't finish the Amanda workout on Day 3.

"I said, 'Ya know, you're a tremendous athlete. I can help you out,'" recounted Hyland, co-owner of DogTown CrossFit in Culver City, Calif. "She was missing some very basic things that could be improved upon and could have an immediate impact."

At the time, Valenzuela was focused on Olympic-weightlifting nationals, where she placed second in the 75-kg weight class.

After the 2011 Games ended, she and Hyland began meeting for workouts and gymnastics work.

Hyland competed at the Junior Olympic National Championships in gymnastics and trained with the U.S. Olympic Team. In college, he competed in NCAA Division 1 men's gymnastics.

> "What I really saw immediately in Lindsey was her competitiveness, her passion and her enthusiasm for CrossFit."
>
> —Dusty Hyland

"We had a good time together," Hyland said. "We see the world of competition in a similar way. We started training together more and more and we started to see more success."

After making significant strides in her gymnastics that boosted her confidence, Valenzuela started to see improvement in her workouts and her recovery time. And so she and Hyland increased their training time together, and he began programming more for her.

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"What I really saw immediately in Lindsey was her competitiveness, her passion and her enthusiasm for CrossFit," Hyland said. "She really loves working out and enjoys what she does, and so do I."

> "Right now I'm very happy focusing on CrossFit and the future I see for myself in the sport of CrossFit."
>
> —Lindsey Valenzuela

CrossFit or Oly?

Had Valenzuela dedicated herself solely to Olympic weightlifting, she could have won the national championship. So says Bob Takano, who coached her from December 2010 to July 2011.

Highly respected in the weightlifting world, Takano is credited with developing and coaching some of the country's best lifters for nearly 40 years. A 2007 inductee into the U.S.A. Weightlifting Hall of Fame, he has coached four national champions, seven national record holders and 28 top 10 nationally ranked lifters. Fifteen of the volleyball players he coached earned Division 1 scholarships.

To boot, his articles have been published by the National Strength and Conditioning Association (NSCA) and the International Olympic Committee, and they helped to establish standards for coaching the Olympic lifts. He is a former member of the editorial board of the *NSCA Journal* and an instructor for the University of California, Los Angeles extension program. He is the chairperson of the NSCA Weightlifting Special Interest Group. Takano is also part of the seminar staff for CrossFit Olympic Lifting Trainer courses, and he's a frequent contributor to the *CrossFit Journal*.

He described Valenzuela as very well-coordinated, very competitive and possessing a good work ethic—despite her minor protests of workouts.

"She complains all the way through a workout, but she does it," Takano said.

When Valenzuela approached him, she did so as a CrossFitter.

"She wanted to do both," he said. "She actually would have made more progress as a weightlifter."

Training for two different sports, Takano added, doesn't work.

"If you're going to be really super good at either one, you need to specialize," he explained.

Today, Valenzuela has her eye on CrossFit.

"Right now I'm very happy focusing on CrossFit and the future I see for myself in the sport of CrossFit," she said. "I don't foresee myself entering in a national (weightlifting) meet or international (weightlifting) meet in the close future, but that does not mean it will never happen. I'm only 25 years old and I feel that I have a long future in both sports."

The lifts have been one of her strengths, said Valenzuela, who has a 195-lb. snatch and a 235-lb. clean and jerk.

"I don't want to stop doing that," she said.

And especially not now that Games competitors are on her heels.

"A lot of girls this year didn't get past 200 lb. (on the Clean Ladder)," she said. "That was a nice surprise, but I also see girls are getting stronger."

In 2011, Valenzuela decided to focus solely on CrossFit, despite her promise as an Olympic weightlifter.

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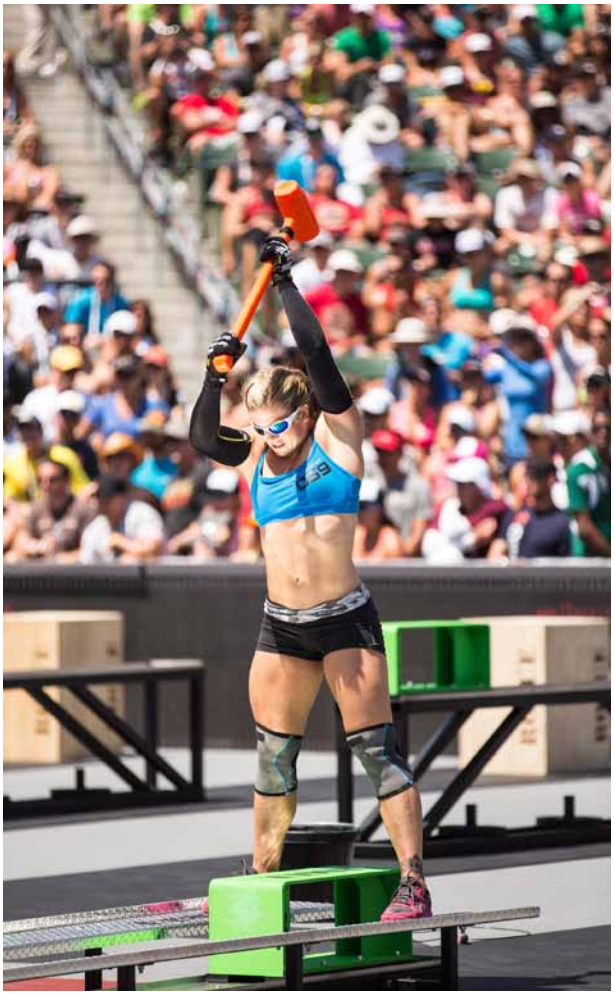

Valenzuela thinks the CrossFit Games will just get heavier—and she's ready.

Valenzuela was one of two women to finish the ladder, which topped out at 235 lb. Elisabeth Akinwale was the other, and she beat Valenzuela in the event by pulling a few extra deadlifts as a tiebreaker. The 33-year-old finished seventh at the Games.

"I feel lifting is a huge priority in my training regime and programming," Valenzuela said. "It may not be at the same volume it was when I was just focusing on Olympic lifting, but it (is) an aspect that is included in my programming on a daily basis. Lifting is something I'm great at and is something that puts me ahead of a lot of girls. I plan on keeping it that way and plan on lifting the rest of my life."

The loads, she added, will only get heavier at CrossFit competitions.

"Every CrossFit (woman) should have some sort of strength program incorporated into (her) programming in order to handle the weights we may see in future programming," Valenzuela said.

Goals for 2013

For the new training year, Valenzuela's programming will mostly be the same.

"I want to keep training the way I have been training—train smart," said the middle-school and high-school strength-and-conditioning coach. "And I want to keep that happy balance between CrossFit and my work life and my personal life."

> "She's one of the most explosive athletes in the CrossFit community."
>
> —Dusty Hyland

For the Open, Valenzuela is keeping it simple: just qualify for the Regional.

"And for Regionals, I have bigger goals for myself," she started. "But I'm not trying to think too far ahead right now. I'm just trying to focus on what I need to get better at."

That includes endurance. "During the longer workouts I kind of second-guess myself," Valenzuela explained. "I guess, mentally, just be better prepared for the longer workouts."

For Hyland, he wants to address weaknesses that led to low finishes at the Games, including 37th in the O-Course, 39th in the Broad Jump and 25th in the Rope-Sled.

"What we're going to do this season is get her more prepared for the unknown," he said. "She's going to get a heavy dose of gymnastics and weightlifting."

Plus, Hyland said he plans to "up the cycle" of explosive barbell movements.

"She's one of the most explosive athletes in the CrossFit community," he noted.

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Valenzuela, who has signed up for various competitions, said she will remain in off-season mode until October.

"I'm not pushing anything right now. I'm not looking to go to any competitions. If I feel like going, I will," she said. "I'm doing what my programming requires of me and I'm just going with the flow. I don't want to focus on competing until I'm mentally ready (to)."

For the time being, Valenzuela said she wants to focus on getting stronger, faster and better than her competitors.

"The next couple of months will be challenging because I will be working (a lot) on skills and will be focused on my weaknesses, which will not only be challenging physically, but mentally taxing as well," she said.

"Life's short. If we didn't like to do this and training together, we wouldn't," Hyland said. "I think that ultimately if you're looking for a coach, you need to find someone you can deal with on a personal level as well as professional level."

Hyland added: "We're very vocal together. That's sort of who she is."

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After finishing 37th in the O-Course, Valenzuela will spend the next year attempting to prepare for the unknown.

Courtesy of Andréa Maria Cecil

About the Author

Andréa Maria Cecil is the Regional Community Media Director for the Australia, Europe and North East regions. She was also the North East Regional Media Director for the 2012 Reebok CrossFit Games. Cecil has been a freelance writer and editor for the ***CrossFit Journal*** *since 2010 and also writes for the CrossFit Games site. She spent nearly 13 years as a professional journalist, most recently as managing editor of the* ***Central Penn Business Journal*** *in Harrisburg, Pa. The 34-year-old is a native of New Orleans who lives in York County, Pa. There, she's been doing CrossFit since 2008 at CrossFit York, where she coaches Olympic weightlifting as a USA Weightlifting Level 1 Sports Performance Coach. Additionally, Cecil dedicates four days a week to training the Olympic lifts herself at McKenna's Gym.*

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User Guide:
Finding the Right Coach and Affiliate

Choosing a CrossFit coach or affiliate is an important decision.
Here are some things to think about when making your choice.

September 2012

All images: Staff/CrossFit Journal

This article provides a basic framework on how to find a CrossFit coach and an affiliate. It's a set of suggestions that can be used as a road map—not a comprehensive treatise.

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Your Responsibilities

1. Know yourself: You must evaluate your goals and experience honestly. No one else can do this for you.
2. Educate yourself: Fitness is about capacity; training is about expanding capacity. You must challenge your limits. Think of fitness as a process of learning the physical, mental and nutritional components of functional capacity.
3. Communicate: Ensure the coach knows your limits so he or she can help you expand them.
4. Do the work: Ultimately, you have to put in the effort, manage your nutrition and make sure you rest enough.

The Process of Getting Fit

1. Mechanics: Developing competency in the foundational movements.
2. Consistency: Developing the habits and patterns that support fitness.
3. Intensity: Pushing the limits of your capacity once mechanics and consistency are established.

How to Evaluate a Coach

The relationship you have with your coach is key to your success. He or she must understand you physically and mentally, and, above all else, he or she should inspire confidence. Before committing, consider taking a few classes with a prospective coach or ask to watch a class he or she leads. Doing so will allow you to see if your coach has the qualities needed for effective training.

An effective trainer must have capacity in six abilities:

1. Teaching movement.
2. Seeing movement.
3. Correcting movement.
4. Group and/or gym management.
5. Presence and attitude.
6. Demonstration of movement.

An effective trainer recognizes each person has different needs and goals. It is the trainer's responsibility to determine how to relate to and motivate each individual to help him or her reach stated goals. A positive trainer demonstrates interpersonal skills with an ability to interact and communicate with each athlete individually.

As CrossFit founder and CEO Greg Glassman explained in 2006:

> Because I want my clients' training experience to transcend the physical realm, I am obligated to understand their jobs, hobbies, families, and goals. Motivating clients to transcend fitness requires that I be involved in their lives. This isn't going to happen without my being both interested in them and interesting to them.
>
> Indeed, I am a personal friend to nearly every one of my clients. This is extremely gratifying work and often emotionally charged, but that's all right because I am an integral part of my athlete's lives, and life is full of laughter, tears, and hope.

A great trainer can often improve movement dramatically with only one or two well-chosen words.

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Excellent trainers see movement and know exactly how to make it better very quickly.

Mechanics, Consistency, Intensity

The three-part charter of CrossFit—mechanics, consistency and then intensity—comprises the nonlinear progression essential for rookies and veterans.

1. Mechanics

Mechanics determine whether the athlete achieves fundamental techniques necessary for performing the movements.

Like Todd Widman, Level 1 Seminar Staff, said in 2009: "For us, this means moving yourself and external objects in the most efficient, effective, and safe manner possible."

2. Consistency

A. Consistency determines whether the athlete can perform rep after rep correctly without instruction.

B. Consistency also determines if the athlete is training frequently enough to garner a tolerance for intensity.

Only after mechanics and consistency have been mastered can a coach safely increase a program's intensity.

It's like Widman explained: "CrossFit workouts are very potent medicine; too much too soon and you can severely hurt yourself. Luckily, the body adapts quickly, and before you know it, you will be hitting each workout with maximum personal intensity."

3. Intensity

Defined as power, intensity is the amount of work done per unit time. The pursuit of intensity inevitably leads to performing movements at high speed.

Mechanics *and* intensity can be lost on inexperienced trainers who think only intensity matters. An effective trainer understands the progression. Coach Glassman noted in 2005:

> There is a compelling tendency among novices developing any skill or art, whether learning to play the violin, write poetry, or compete in gymnastics, to quickly move past the fundamentals and on to more elaborate, more sophisticated movements, skills, or techniques. This compulsion is the novice's curse—the rush to originality and risk.

The Benefits of Training at an Affiliate

Communities flourish at CrossFit gyms. There, members forge fitness and lifelong relationships. The sense of belonging makes CrossFit unlike any other fitness program in the world.

At CrossFit gyms, you're not anonymously walking on a treadmill for an hour. Your workout experience is shared with every other person there, and chances are they're suffering in the workouts more than you are. CrossFitters choose more demanding workouts because they recognize the benefits, both physical and mental, of hard work.

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A great trainer is also a great motivator and will help you find new strength, both mentally and physically.

Reasons to train at an affiliate:

- Easy to get started and be consistent—everyone there is already CrossFitting.
- Access to coaching for improved mechanics and nutritional guidance.
- Community that will encourage your progress.
- Fosters a system of accountability for continued improvement.

The Right Fit

Like all relationships, learning from a coach takes time, patience and commitment. You're often changing decades-old movement patterns—no simple task. Having said that, if it's clear the coach isn't the right fit for you, find one who is. The same goes for the CrossFit affiliate. Both components must work for you.

The investment of your money, your time and your effort is paramount when you're trying to get fit; you need to make sure you're doing that at the right place and with the right people. Choosing the right coach or affiliate is an empowering process. Great coaches and gyms will show you just how valuable you are by earning your membership.

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THE CrossFit kitchen KIDS

Sweet Cheeks Headquarters

BLUEBERRY POPS

by Shirley Brown and Alyssa Dazet
Sweet Cheeks Headquarters

overview

Arts and crafts are a lot of fun—especially when the kids get involved. Add food in the equation and you have the ingredients for a good mix of creativity and nutrition. These blueberry pops are a perfect mixture of crafts and cooking that will entertain and please your palate.

ingredients

1 pint blueberries, washed and dried

1 can full fat coconut milk

6 wooden skewers

Wax paper

Cookie sheet

notes

You could drizzle with chocolate for more variation or sprinkle with shredded coconut directly after a dunk in the coconut milk.

directions

1. Thread blueberries onto skewers, leaving enough space for a handle at the bottom.
2. Place threaded skewers onto a cookie sheet lined with wax paper and freeze for 30-45 minutes.
3. Pour coconut milk into a tall glass, leaving enough room to dip your skewers into it.
4. Remove the frozen berries from the freezer and carefully dip the skewers into the coconut milk so a layer of milk covers all the blueberries. Place the blueberry pops back into freezer for 10 more minutes. Repeat 1-2 more times until a thick layer of coconut milk covers your berries.
5. Serve cold.

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CrossFit and GPP

Tony Leyland explains why general physical preparedness is a good thing for elite athletes and beginners.

By Tony Leyland **September 2012**

All images: Mike Warkentin

These are exciting times for the avid CrossFitter.

The success of the CrossFit Games comes in part because humans are competitive by nature. Our ancestors had to be competitive to survive. Therefore, it is only natural that when confronted with a new sport or challenge, many of us rise to the occasion and try to excel.

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Whether it's carrying groceries, moving furniture or lifting luggage, sooner or later life is going to get heavy.

CrossFit has struck a chord with thousands of athletes worldwide, and it has sparked the interest of athletes who see potential for it to be a semi-professional and even a full professional sport.

I believe the continued growth of the Games, the Reebok sponsorship and the television advertisements have sparked the interest of thousands and thousands of people. Basically, more people will be introduced to a fantastic way of training because of this growth. However, a potential negative aspect of advertisements and Games success is that many will incorrectly view CrossFit as too intense, beyond their capability and as a sport for elite athletes.

I have written this article to provide some basic ammunition to convince people otherwise.

We all know this important quote from the CrossFit.com "What is CrossFit?" page: "Our program delivers a fitness that is, by design, broad, general, and inclusive. Our specialty is not specializing. Combat, survival, many sports, and life reward this kind of fitness and, on average, punish the specialist."

The word "inclusive" is a key component of this sentence.

Put simplistically, as the understanding of CrossFit grows, two large groups of people will view CrossFit as either beyond their capability and/or not relevant to their training needs. One group comprises competitive athletes who think CrossFit workouts are not relevant to their sport. The second and larger group comprises those looking for general fitness, those who are by nature not competitive and those who believe the general misconception that aerobic conditioning is all they need. I propose that these two groups may be difficult for affiliate owners to connect with despite the increased publicity.

I will discuss the benefit of CrossFit training for these two groups somewhat separately despite the obvious fact that the topics I discuss are relevant to both groups. I will make no apologies that this article has a little more personal and anecdotal information than many of my previous exercise-physiology-based articles. One reason for this is that the research in the area of fitness has largely ignored one major benefit of CrossFit training: transfer of training.

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Becoming a more well-rounded athlete can give elite athletes an edge over their competition.

Athletes and General Physical Preparedness

As stated, many athletes look at CrossFit's "our specialty is not specializing" quote and think the program is unsuitable for athletes specializing in another sport. This is far from the truth. Building a strong work capacity across broad time and modal domains will help all athletes achieve their goals. For non-competitive persons, this broad and general fitness will clearly help them perform their daily activities more easily and reduce injuries. This concept of needing a base of fitness, a non-specialized training program, is often referred to as general physical preparedness (GPP).

This is what Coach Greg Glassman once wrote about GPP on the CrossFit Message Board:

- GPP is the most underdeveloped and neglected aspect of athletic training, especially in elite athletes.
- CrossFit produces an unmatched GPP in novice, intermediate, and advanced athletes regardless of their prior training and sport.
- Every athlete we've worked with, from Olympic medalists to UFC legends, has some glaring chink in his/her GPP, and it takes at most two hours, two sessions, on average to find these chinks.
- Fixing these chinks, these deficiencies, has an immediate benefit within your sport and very often in ways not quite obvious mechanically and perhaps metabolically. For instance, more pull-ups make for better skiing and skiers. Upper-body pushing movements make for better rowing and rowers. Anaerobic training is a boon to endurance athletes.
- There's greater margin for improving performance in elite athletes by improving GPP with CrossFit than can be garnered through additional sport-specific training.
- "CrossFit produces a 'ready state' from which more advanced or sport-specific training becomes very efficient." —Mark Twight
- CrossFit will for many sports reduce the total training volume, reduce training injuries, and allow more time for vital sport specific skills and drills.
- CrossFit is more fun and seems more athletic to experienced athletes than does traditional GPP.
- CrossFit has athletes improving their fitness for years beyond, to levels significantly beyond, traditional GPP.
- Sport training and physiology are not so well understood that highly specialized strength and conditioning routines are optimally effective.

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There is a lot of truth in these statements that many experts who are not involved with CrossFit would support. For example, in 2009 I attended the annual conference of the Canadian Society of Exercise Physiologists and attended a talk on "Philosophy of Training" by Dr. Jay Kearney. Kearney, a 1980 Olympian, returned to the United States Olympic Committee in December 2006. Kearney had previously served the organization for 14 years as a sports physiologist in the Sport Science Division from 1986 to 2000. His expertise was accumulated in a 30-plus-year career focused primarily on optimization of elite-level athletic performance. During this time he has been at 14 Olympics, coached and competed at the international level, and served the needs of coaches and athletes.

> I am not saying that being an elite athlete in a particular sport does not take considerable specialized training. What I am saying is that outstanding GPP will make you a better athlete.

Kearney's talk was a presentation of a series of observations over his career that he called his "tenets of training". I will not repeat all of them here, as some were basic principles that I have discussed in my July 2007 *CrossFit Journal* article Principles of Physiologic Conditioning. However, I have listed several of his observations below that mesh perfectly with those aspects of CrossFit philosophy that all athletes need to understand:

- Athletes tend to do, or prefer most, that type of training they need the least.
- It takes a larger foundation to build a church than it does to build an outhouse.
- Elite athletes are not grown-up college sophomores.
- Transfer of training adaptation is a vastly underappreciated concept and has been largely ignored in research literature.

I will briefly discuss these four tenets even though some are well understood by the CrossFit community.

We all know that we need to work on our weaknesses, but we equally know that without a coach to push us, we are very good at avoiding our weaknesses. We all like to do what we're good at, but that will not fix deficiencies in our fitness armor. Do I really "want" to do overhead squats? Do I really "need" to do overhead squats?

I am not just a "CrossFitter" in the sense that it is my only sport or exercise regime. I am a competitive tennis player, and I ski a lot during the season. I only recently hung up the soccer boots after playing at the competitive masters level. I'll be honest: if somebody calls for me a tennis game when I was considering doing Fran, the answer will be, "What time shall we meet at the court?" I love sports, I love chasing tennis/soccer/rugby/squash balls, and I love beating people. Having said that, CrossFit is my GPP program; it improves my ability in sport and in life.

When an affiliate owner is trying to convince an athlete to start CrossFit, the athlete often finds it hard to believe that most research has largely ignored GPP. Coach Glassman's statement above is, "GPP is the most underdeveloped and neglected aspect of athletic training, especially in elite athletes."

Dr. Kearney concurs with the statement, "Transfer of training adaptation is a vastly underappreciated concept and has been largely ignored in research literature."

CrossFit's varied, scalable programming will benefit elite athletes, general fitness enthusiasts and everyone in between.

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Speed and agility: two of CrossFit's 10 physical skills neglected by much of the general population.

The question many of my students ask is "how can that be?" The answer is quite simple. How can I prove having more pull-ups will improve the performance of the soccer players I coach? I can do a study to show this or that particular training regime will improve pull-ups, but being better at a sport is impossible to directly measure due to the myriad variables that are relevant to sport success. So the simple truth is researchers have largely ignored transfer of training or have measured narrow aspects of this phenomenon.

For example, I can easily do a study to show weight training improves an athlete's tennis-serve velocity as that is a single, easily measureable variable. However, the fact that CrossFit trains so many aspects of physical performance required by a tennis player means it is difficult to truly "prove" the outstanding GPP delivered by CrossFit will make you a better tennis player. We all know that with CrossFit the whole is greater than the sum of the parts, and this, too, is hard to study.

I am not saying that being an elite athlete in a particular sport does not take considerable specialized training. What I am saying is that outstanding GPP will make you a better athlete. The wonderful aspects of CrossFit Football, CrossFit Endurance and other CrossFit programs is that they realize the benefit of outstanding GPP: they are trying to specialize their athletes from a big foundation (building a church not an outhouse).

Another aspect of the research that has confused the study of human performance is that many studies have not used committed and skilled athletes. As Kearney puts it, "Elite athletes are not grown-up college sophomores." Beware of research conducted on college students and that claims to be relevant to elite athletes, Marines, firefighters or anyone who isn't a college student.

If you look at elite CrossFit athletes training, it's clear that the amazing physiological response to CrossFit programming is enhanced due to the psychological drive and commitment required to perform the WODs. You can get huge fitness improvements in a sedentary individual with a pretty average training regime, and for this reason the research is littered with studies showing mediocre programs getting results. As Coach Glassman's ninth point above states, CrossFit coaches have observed already very fit athletes increasing fitness levels for many years when following CrossFit programming. Even at the age of 56, I have found some aspects of my fitness have improved over the six years I have been doing CrossFit programming, while other components in which I was already very conditioned have hardly suffered by less specialization.

General Population and General Physical Preparedness

I think the above discussion is a strong argument for athletes not to over-specialize and to pay attention to GPP. Therefore, I think it goes without saying that the rest of us should focus on GPP. If you are not a specialized athlete, your training should be aimed at keeping you healthy and prepared for the variety of challenges life will often throw at you. Unfortunately, many individuals with no aspirations to be competitive athletes train only in one or two physical skill areas and only in the oxidative energy system. Hence, they become specialized without intending to. Many others just lift weights and are only fit to lift weights. The net result is that many of the exercising public totally ignore, or are unaware of, the need for GPP.

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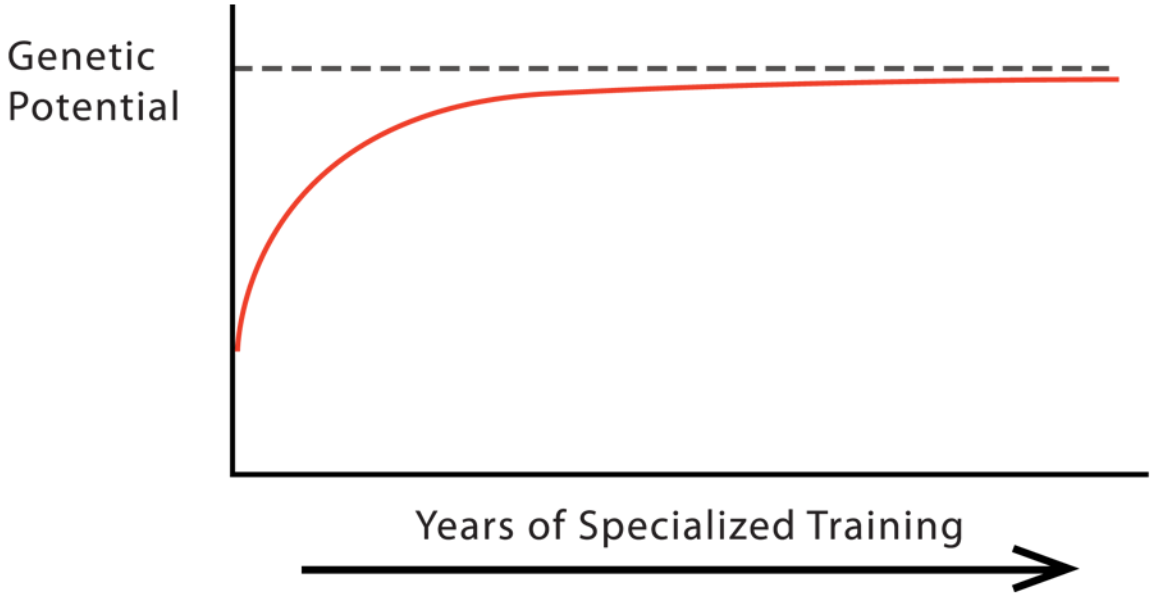

Figure 1: Hypothetical performance curve.

A strong argument to make when suggesting a non-athlete try CrossFit is that there are diminishing returns when you keep doing the same thing over and over. Figure 1 is a simplified version of a graph Mark Rippetoe presented in his September 2007 *CrossFit Journal* article Strong Enough? This is a hypothetical graph showing how athletes progress toward their genetic potential in any given activity. I say "hypothetical" because, although we know the general shape of such curves, we cannot claim to know the exact steepness of the curve related to training years. However, I believe the curve should convey the basic concept—fast progress early in training as a novice, and increasingly slower progress as you improve toward an elite performance level (in fact, any progress is hard to achieve at the elite level).

Figure 1 could represent any activity. The Y-axis could be your genetic potential for the press or your 10-kilometer run time. You could draw literally an infinite number of these curves for any activity and power output. However, it is not possible get very close to the limit of your genetic potential in all of these activities. Nobody can run a 2.5-hour marathon and deadlift 700 lb. It is simply not possible to get really close to your genetic potential in such vastly different events for several reasons:

- Long-distance aerobic work, like marathons and other endurance workouts, may catabolize some muscles and would therefore be detrimental to someone wanting to be as strong as possible. You literally use some of your muscle for fuel during really long endurance events.
- Building upper-body musculature is going to add weight, and moving that weight around the track or over a mountain is going to be harder and will slow you down. Alberto Contador, the winner of the 2007 and 2009 Tour de France, was at that time 5-foot-9 and 135 lb.—great statistics for getting over mountains, but don't ask him what weights he uses for deadlifts or back squats! Having said that, even cyclists climbing mountains can benefit from a good GPP base.
- At the cellular level, concentrations of aerobic and anaerobic enzymes cannot both be maximized.
- Training some energy systems and some muscle groups detracts from training others. There aren't enough hours in the day to maximize everything, and even if there were, your body would be too fatigued to continue training.

I am simply stating that you will not be close to your

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genetic potential in any specific activity if you embrace CrossFit. That may sound like a negative comment, but it isn't. Although we can be rightly amazed at the genetic potential of the very best, these performances come at a huge price. For example, the world record for the 10-kilometer on the track is 26:17.53 (the female world record is 29:31.78). Can you imagine what these individuals can clean and jerk? Some humans can bench more than 1,000 lb. (not without a crazy bench-press suit, but that is another story), but moving their body weight over distance would be virtually beyond them. I could go on, but you get the picture.

The media currently plays up the top mode-/intensity-specific athlete, and it will be interesting to see if there is any shift in this love affair with specialization as CrossFit gains further popularity.

If you look at the curve in Figure 1, you can probably figure out that it is possible to get to a reasonable level in lots of things. The curve rises steeply when you first start activities, so if you start a new activity, you will see progress quickly. I think this is part of the reason CrossFit has been very well received and has grown rapidly—people see great improvements in many areas. Is this a trick? I do not believe so. CrossFit is simply a program that effectively says, "Rather than run and run and run and see little further improvement, why not run some days (and maintain a decent level of running) but spend more time doing other things?"

For the general public I would ask, "What would you want: 80 percent of your genetic potential in strength, speed and endurance or 95 percent of your genetic potential in endurance but only 50 percent of your genetic potential in strength and speed?" I only use those percentages to illustrate the concept; nobody can really put a definitive figure on what is achievable. The answer depends on the individual and his or her training intensity and variety. However, many top-level CrossFit athletes might be able to run 10 kilometers in 40 minutes and deadlift 500 lb. That's an impressive combination, and although neither score for that event is anywhere near world class, that type of individual would make a better Marine or firefighter than someone with a 35-minute 10K and a 200-lb. deadlift.

Obviously I could write at length on the specific benefits of CrossFit for the general public, but I and many others have discussed specific examples in numerous articles. For example, in my March 2007 *CrossFit Journal* article Performance and Health, I specifically discussed the benefit of CrossFit training in maintaining back health and reducing the incidence of slips and falls. So I will finish this article by just mentioning another major misconception preventing many from starting CrossFit: the intensity of the WODs. To this complaint I have two major responses.

The athletes in this picture are a railway worker, a student, a teacher, and a firefighter and aspiring CrossFit competitor. Who is which, and does it matter?

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The first is to tell the potential CrossFitter not to shoot the messenger. We didn't create our DNA; nature did that. Per-Olof Astrand (M.D., Ph.D.) is a world-renowned exercise physiologist, and in his authoritative *Textbook of Work Physiology* (Åstrand and Rodahl, 1970), he states that "close to 100% of the biologic existence of humans was adapted to an outdoor existence of hunting and foraging for foods." He noted major adaptations for human survival "were consistent with habitual physical activity, including endurance and peak effort alternated with rest." So peak efforts are in our DNA. If you can't think of a situation where you might have to perform a short, maximal sprint or exert a large force, you have a great—but naïve—outlook on life.

Another point I make is that even starting CrossFit at a low intensity and reducing the measured aspect because the client isn't competitive is still a great first step. As an example, even a relatively light overhead squat is going to improve balance, core endurance and flexibility. The CrossFit magic is in the types and variety of movements and the varied intensity. But even if a client only taps into part of that magic, he or she is still going to benefit greatly compared to doing the same thing over and over again.

The bottom line: ignore GPP at your peril.

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Our bodies are made to be challenged, and training for these challenges makes them easier when they show up in the real world.

Courtesy of Tony Leyland

About the Author

Tony Leyland is a senior lecturer in the Department of Biomedical Physiology and Kinesiology, Simon Fraser University, Vancouver, Canada. He has taught at the university level for 30 years and has been heavily involved in competitive sports such as soccer, tennis, squash and rugby as both as an athlete and coach for over 45 years. He is a professional member of the National Strength and Conditioning Association and the British Columbia Association of Kinesiologists. He is a Canadian National B-licensed soccer coach and a Level 1 CrossFit trainer. He is currently the head strength and conditioning coach for West Coast Auto Group Football Club, a large soccer club in the mainland of British Columbia.

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THE CrossFit LIFE

Connecting Through CrossFit

A mother and son strengthen their bond through a shared love of CrossFit. Hilary Achauer reports.

By Hilary Achauer **September 2012**

Hilary Achauer

Barbara Pappas had always been healthy. Growing up in Germany, she ate a diet relatively free of processed food, and she kept in shape by jogging and taking leisurely bike rides, which she calls "biking with a basket."

A Montessori teacher, Barbara filled her life with work and raising her sons. Then, in 2010, her 19-year-old son Nick discovered CrossFit. A wrestler and football player in high school, Nick was instantly addicted to CrossFit. Nick spent the summer reading through the *CrossFit Journal* and watching videos on CrossFit.com, eager to learn as much as possible. Nick got his Level 1 certificate in December 2010 and began coaching while pursuing his degree in kinesiology at Sonoma State University.

Nick told his mom about his newfound passion, but it wasn't until early 2011 that Nick convinced his 51-year-old mother to try a class at CrossFit Valley of the Moon in Sonoma, Calif.

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Mickey Breen

Barbara added meat to her diet and felt an instant change in her recovery and energy level.

"I knew nothing," Barbara said. "I didn't know what a barbell was, what a deadlift was—it was all Russian to me."

After she ran through the warm-up that she said almost killed her, Nick put a 12-inch box in front of Barbara and said, "Hop up."

She couldn't do it. The barrier was not physical but mental.

"I was terrified about my inability," Barbara said.

She looked at the box and could not make her feet leave the ground. Despite her fears, Barbara continued with the workout, and like her son, she was hooked. Soon the other Pappas son, Dustin, was doing CrossFit.

Barbara loved the challenge of the workouts and felt herself getting stronger, but after a few months she felt something was wrong.

"I felt more than sore," Barbara said. "I felt brittle, and I had trouble sleeping."

Nick knew what was wrong.

"Mom, you have to watch your nutrition," he told her.

Although she was a healthy eater, Barbara was a vegetarian. She hadn't eaten meat for 20 years.

"We ate pasta every day," Nick said. "Our favorite dinner was pasta, ketchup and Parmesan cheese."

Frustrated by feeling weak and out of sorts, Barbara decided to take her son's advice and started eating meat.

"Within two days, I felt better," Barbara said. "I had a burst of energy. It was like my body was saying 'thank you.' It was an internal coming home, and it was really exciting."

Eight months later, Barbara was deadlifting 210 lb. and back-squatting 135 lb. When she started, she couldn't do one push-up—now she rocks kipping handstand push-ups with just one AbMat under her head, and she recently did 100 unbroken 35-lb. kettlebell swings.

"I am accustomed to seeing human capacity," Nick said, "and I knew she had high capacity. I always believed in her."

Barbara and her sons were always close, but CrossFit strengthened their bond. Due to her long hours at work, Barbara often has trouble making it to the classes at her box, so Nick programs for her.

Courtesy of Barbara Pappas

Barbara bonds with her sons, CrossFit-style.

"Nick coaches me every day," Barbara said.

"It was a learning process for us both," Nick said of programming for his mom. "I learned how to train for someone in her 50s. I taught her to manage her rest days. She was doing CrossFit six days a week, and I had her switch to three days on, one day off."

Barbara smiled guiltily and said, "Sometimes I cheat."

Their biggest triumph together was earlier this year, when Barbara was able to do every workout in the 2012 CrossFit Games Open.

"I need to credit Nick for getting me through workout four," Barbara said of Event 12.4, which included 150 wall-balls, 90 double-unders and muscle-ups. Barbara did all the wall-balls and 11 double-unders.

Spend any time around Barbara and Nick, and their deep respect and affection for each other is apparent. They truly enjoy each other's company and often seem to relate more as friends than mother and son. They've always been close, but CrossFit has strengthened their bond and changed the typical parent/child dynamic. After 21 years of learning from his mom, Nick has the chance to teach her. And after years of cheering on her son, Barbara gets to hear her son's praise for her own accomplishments.

"My boys are the best things in my life" Barbara said, "I wouldn't be much without them."

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THE
CrossFit JOURNAL

Dallin Frampton: CrossFit in Kenya

CrossFit is changing lives in Africa. Emily Beers asks Dallin Frampton how the affiliate community can help.

By Emily Beers **September 2012**

Staff/CrossFit Journal

When Dallin Frampton speaks, his wisdom and experience radiate from his words. He's calm yet passionate. Creative yet level-headed. And then you discover that you're talking to a 22-year-old.

But this 22-year-old isn't your ordinary wide-eyed college student living off beer and macaroni and cheese. This 22-year-old has employees working for him and life experiences and responsibilities of men twice his age.

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True to his hands-on nature, Frampton started helping out from the minute he arrived in Kenya.

Frampton, an anthropology student at the University of Utah, is the man behind the CrossFit School in Kenya, the project manager of the entire CrossFit mission in Kenya.

Frampton isn't your average 22-year-old, and he wasn't your average 19-year-old. That's how old Frampton was when he heard a voice inside his head urging him to get out there and do something big.

"Back in August 2009, I heard about an organization called Koins for Kenya from a friend. And I know it sounds so cheesy and corny, but I just had this calling," Frampton said of how it all started.

"There was just this little voice in my head. It was like someone was saying, 'Dude, you gotta go to Kenya,'" he continued.

Frampton listened to the calling and started to pick his friend's brain.

"We sat down together one day and I just started asking questions," Frampton said.

After gathering all the information he needed, Frampton marched over to the Koins for Kenya head office to find out how to get to Africa.

"So I get down to this guy's office—to the executive director's office—and he says, 'What do you want to do?'" Frampton remembered.

"I want to go to Kenya. I know you only do short week-long expeditions, but I want to go for a while," Frampton told the executive director.

The man wasn't sure how serious Frampton was, and he certainly wasn't going to hand the young 19-year-old the keys to Koins for Kenya that easily. Instead, he told Frampton to raise US$10,000 and come up with a project idea.

"To be honest, I think the director thought I was BS-ing him. He didn't think I was going to follow through with it," Frampton said.

But Frampton was not BS-ing, and he wasted no time following through on his word. Four months later, Frampton went back to Koins for Kenya and threw down $13,000, money he had raised by performing with his band and through direct donations.

"So, what's the next move?" Frampton asked.

"When do you want to go to Kenya?" the director replied.

Off to Africa

In March 2010, Frampton hopped on a plane to Kenya with 10 others. He threw himself right into the mix, helping build multiple schools in various villages. From building desks to painting, Frampton helped in any way he could.

For much of his six-month stay, Frampton chose to live in the village with the natives of the land. It helped him fully adapt to his new environment and feel more connected with the villagers.

"I built my own house to live in. And my own outhouse," Frampton said. "It was basically just a hole … kind of Tarzan-ish, which was pretty sweet. And I put palm leaves around it and roped it all together with local tree roots," he explained. He wrote about the experience in the *CrossFit Journal* (It Makes a Village, July 2012).

"In Kenya, I had to get used to a very basic diet. Corn is a staple. They made something out of it called *ugali*. Basically, they mash the crap out of corn until it turns into corn floor. Then they add water until it turns into a play dough," said Frampton, who ate ugali pretty much every day for six months.

He added: "Some days, there'd be a small fish for dinner, other days it was ugali with beans and local vegetables."

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Mike Warkentin

Coach Greg Glassman, Frampton and CrossFit staff visited the CrossFit School in Dzendereni in May 2012.

It took him a while to adjust, but after six months he felt fully immersed in the Kenyan lifestyle. It was coming home to Utah that ended up being an even tougher adjustment.

"It was surreal coming home the first time, to go from nomadic and native conditions to a place where everyone has everything," he said. "When I came back to Utah after half a year, I stayed in a fetal position for the first two weeks … . It just kind of sucked being home again."

Since then, Frampton has journeyed to Kenya five additional times, with another trip planned this fall. He says it's always an adjustment to get back into the rhythm of the land, both in the United States and in Kenya, but it's been well worth it.

The CrossFit School

In February 2011, CrossFit founder and CEO Greg Glassman and a group of CrossFit personnel travelled to Park City, Utah, for a retreat. Joining them for the weekend getaway at a local ski resort was a group of CrossFitters eager to meet Coach Glassman.

Frampton and some others from his affiliate made the trek.

"That Saturday night, Glassman did a question-and-answer session," Frampton remembered. "I started talking to him, and I don't even remember how we got on the topic of Africa."

But somehow they did. And before he knew it, Frampton had told Glassman all about Kenya.

"I saw this spark in his eye," Frampton said of Glassman. "He seemed instantly compelled."

"We want to be involved in that. How do I get involved?" Glassman asked Frampton.

"Well, it costs $10,000 to build a school. You can name the school whatever you want," Frampton told Glassman.

On the spot, Glassman pretty much said, "Sign me up," Frampton recalled.

Frampton wasn't sure what to make of it. Glassman was obviously inspired, but Frampton didn't know the magnitude of the inspiration.

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"I thought at best he might follow through with sponsoring a school and maybe he'd want a couple pictures of it before moving on to something else," Frampton said.

Glassman and CrossFit did more than follow through and request a few pictures. CrossFit built a school, complete with desks and a rainwater-collection system. Glassman himself has visited the school several times, and he hired Frampton to take the Kenyan initiative to the global CrossFit community. Together with the Infant Swimming Resource, SAT prep and Hope projects, the effort in Kenya is one of four initiatives CrossFit is currently supporting in a big way.

"I never thought this project would become a branch of CrossFit that Glassman is so focused on and is putting huge resources into," he said.

Frampton added: "I mean it's really been unbelievable. To get an entire worldwide community that is stoked on it, that share a vision that we can roll out to thousands of people across the world, that's pretty cool."

CrossFit School: One Year Later

The CrossFit School, located in Dzendereni, a small village outside of Mombasa, was built in the fall of 2011 and opened in December 2011. Frampton joined a small team in December to put the finishing touches on the school before it opened to students.

To read more about the CrossFit School, check out Mike Warkentin's piece Live and Learn.

The differences in the village since December 2011 have been vast.

"To say it has been a night and day difference wouldn't even do it justice," Frampton said. "Before the CrossFit School, kids were meeting in a room made of sticks and mud that had holes in it. How can you focus in school when things could fall on your head?" he asked.

Today, just 100 meters up the road from the old school is the CrossFit School, a stable concrete building, where kids have proper desks to sit in, where they have chalkboards to write on, and where they have clean water to drink. The school is bright and airy and clean. On top of this, attendance has jumped more than 50 percent, and children's grades have improved drastically.

"One girl in the eighth grade was even invited to a nationally ranked high school in Nairobi," Frampton said proudly. "It's because of CrossFit's contribution to this village."

Mike Warkentin

Attendance increased more than 50 percent after kids started attending the CrossFit School.

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Mike Warkentin

Coach Glassman poses with a tree he planted beside the CrossFit School in Dzendereni. Its growth will mirror that of the children in the village.

That's a big deal in a country where you have to qualify to go beyond eighth grade. Failing to do so usually means a hard life in the fields, as well as a lowered life expectancy. Going to high school is one of the only ways to escape poverty.

Despite the progress in the first year, Frampton has bigger plans.

So far, the focus in the village has been getting clean drinking water and improving education, but soon they'll be able to shift the focus to luxuries like deadlifts and pull-ups.

"Right now we're doing minimal workouts with the kids. The plan is to slowly integrate CrossFit into their physical education program, but there are prerequisites that come before CrossFit, things like clean water and proper nutrition."

More than anything, Frampton wants other CrossFitters and affiliates to get on board and to help drive needed change.

"I want the CrossFit community to become even more involved in Kenya. I just want to see everyone grow together. I want to keep making connections over there, to create more success stories," he said.

Getting Involved

Since the CrossFit School opened in Dzendereni last year, many American affiliates have responded by getting involved in the Kenya mission. Frampton explains that options for affiliates to raise funds are widespread.

Jeff Hughes of CrossFit Orange County was inspired by the CrossFit Kids for Africa Schools initiative and responded by holding a fundraiser this summer.

"We wanted to assist more than having a donation jar in the gym," Hughes said.

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Mike Warkentin

Even small amounts of money can have a big impact on the future of young Kenyans.

Hughes' efforts involved hosting CrossFit For Heroes, a competition that used firefighting techniques and equipment and was held at the Orange County Fire Authority in Irvine, Calif.

Steve Serrano of CrossFit Marina in Huntington Beach, Calif., is another who was inspired by efforts in Kenya.

"We were moved by the simplicity and virtue of the concept," Serrano said.

Serrano heard about Hughes' competition and held a similar event on the same day for his own members.

"We left fundraising options open so that our members will hopefully continue to literally give coins, which we all know can add up significantly over time," Serrano said.

Keeping options open for affiliates is part of the beauty of the Kenya initiative, explains Frampton. Affiliates are free to help in any way they see fit, donating as much or as little as they can toward the Kenya cause.

Hughes has taken advantage of this. On top of hosting his competition, he also held a casino night with a raffle to raise further funds. And his affiliate is currently selling T-shirts. The graphic on the back of the T says, "This shirt helped build a school in Kenya."

The point that Frampton wants to make clear to affiliates is that everyone's efforts, big or small, will go a long way to help kids in Kenya.

Serrano added: "This is really a movement for which every little bit counts."

A host of projects can be funded by the CrossFit community. School rooms, rainwater-collection systems and desks are some of the options, but CrossFitters can also help Kenyans improve their diets via chicken coops, small fish ponds, sustainable gardens filled with diverse produce, and more. The overall goal is to improve the lives of Africans by improving their health and giving them every chance to get a good education. No donation is too small, and even the smallest contributions can help the CrossFit efforts.

To get involved in the Kenya initiative, contact Dallin Frampton at dallin@crossfit.com

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About the Author

Emily Beers finished a master's degree in journalism at the University of Western Ontario in the spring of 2009. Upon graduation, she worked as a sportswriter at the 2010 Vancouver Winter Olympic Games, where she covered figure skating and short-track speed skating. Currently, she hosts ***WOD HOG****, a not-always-PG publication of the CrossFit Vancouver School of Fitness. She ruptured her Achilles tendon in December 2010 and served as the Canada West Regional Media Director while recovering from surgery. Beers also competed in the 2011 Reebok CrossFit Games on CrossFit Vancouver's team. She finished third at the 2012 Canada West Regional.*

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THE CrossFit JOURNAL KIDS

Ant Colony

Ants are strong for their size—just like your CrossFit Kids.

By Mikki Lee Martin CrossFit Kids **September 2012**

Danell Marks/CrossFit Kids

This nature-inspired CrossFit Kids game is great fun and also leaves lots of space for creative trainers to insert extra work and variations to keep things interesting.

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Equipment

- Small medicine balls (4-8 lb.)
- Two large tires
- Balance beam
- Railyard Obstacle Course or other kind of sturdy elevated structure

Set-Up

In a 30 x 30-foot playing area, create an "ant colony" consisting of straight lines to walk or crawl, an "anthill" reachable by steps or ramps, two side-by-side tires to define a figure-eight walk to simulate "ant confusion," and space to perform wall-ball shots—in that order. At CrossFit Brand X, we used Railyard Fitness' Railyard Obstacle Course for the anthill, a balance beam, tires and the lines on our mat. Surround the anthill with ant food (medicine balls).

Game Play

Trainers describe the traverse through the course, guiding the kids to return to the starting point by going around the outside edges of the playing area.

On go, ants crawl, run or walk along the first line to the balance beam and on to the anthill in the center. Ants pick up and carry food (medicine balls can be scaled for overhead or chest carry), go back up and down the anthill, then continue to the tires to walk the figure-eight pattern before moving to the wall-ball station to perform three wall-ball shots with "food."

Repeat this for about 8 minutes; encourage speed and correct carrying form on chest or overhead.

Ant Fight

At 8 minutes, break and stage all medicine balls around the anthill. Remove other equipment.

All ants circle up around the hill about 15 feet away.

On go, ants crawl quickly to grab a piece of food and then stand prior to picking it up. Require that the kids demonstrate good deadlift and dip-shrug-drop-stand technique when picking up food.

An ant who does not get a piece of food heads to the sidelines. Return the food to the hill, but remove one or two pieces each round, and repeat. Between rounds, ants still competing for food can be asked to do burpees or squats to help prevent false starts. For example, "Do a burpee … . Do another burpee … . Squat … go!"

Sidelined ants play "dead ant"; i.e., perform plank or hollow-rock holds during the round.

Variation

To add difficulty at any time, yell, "Freeze!" and ask for 3 squats, pistol squats or overhead squats.

Notes

Watch for a lot of crawling that can cause sore knees. Sub crab walk if needed.

This game pairs well with CrossFit Kids Warm-Up: Making Ant Food.

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THE CrossFit LIFE

A Prescription for Living

Holly Gera works as the athletic director of a large Division III university, but she never considered herself an athlete—until she found CrossFit.

By Holly Gera **September 2012**

All images: Courtesy of Holly Gera

The author before CrossFit.

I am an athletic director who was never an athlete. I have been happily employed at Montclair State University in New Jersey for the past 23 years, 16 of which I have worked as the athletic director.

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I work at my alma mater, where I didn't make the softball team as an undergraduate student. Now, I oversee more than 460 student athletes in 17 varsity sports programs. We have a long history of athletic success. I love my job, and despite the fact that I've never been an athlete myself, I love my association with student-athletes and coaches.

My casual activities worked pretty well for health and weight control until I hit my mid-40s, every woman's dreaded decade.

I've been active to a varying extent throughout my life, but I never really participated in a regular workout program. I dabbled in aerobics when it was popular and have always walked regularly. I play golf, and I hike while on vacation. My casual activities worked pretty well for health and weight control until I hit my mid-40s, every woman's dreaded decade.

I started to gain weight, and my three or four walks a week were no longer enough to feel healthy and in shape. I started riding my bicycle more regularly as a way to change up my routine and introduce a new and hopefully effective exercise. Nonetheless, I continued to gain weight gradually, and I vacillated between ignoring the problem and trying to find a way to address it.

I was enjoying the addition of the bike to my routine and was hopeful for some good results until one beautiful sunny day in July 2010. While out for a ride, I hit some stones and I fell over the handlebars of my bike, breaking both my wrists. My fractured bones were visible immediately after the fall, and both required surgery. I now carry around some extra hardware and screws.

Question: What do you do with two broken wrists?

Answer: Not very much for a very long while!

The process of recuperation and months of physical therapy tested my patience and perseverance. I was virtually helpless. It was months before I was able to resume basic functions like opening doors, feeding or showering myself, or driving. I gained even more weight and became fearful of falling.

Many more months later, I was confronted with the question of how to resume a workout regimen in my weakened state, which was made worse because of my severely compromised hand and wrist mobility. Additionally, I was dealing with the psychological effect of how tentative I had become and how shaky my confidence was.

In early June 2011, my partner, Sharon Feeney, began CrossFit at Guerilla Fitness CrossFit Morristown, our local affiliate. She was hooked from the first class and couldn't stop talking about how great the program and the coaches were. Sharon is an athlete who was once a competitive swimmer. She played multiple sports at a high level from an early age, something she kept up through college. Her affinity for CrossFit and the community was natural.

Gera was terrified when she first started CrossFit, her confidence shaken by a serious bike accident.

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Gera after a year of CrossFit.

Given my desire to begin an exercise program, the thought of CrossFit was intriguing, but neither of us thought someone with two compromised wrists could participate in any meaningful way. Sharon spoke to the coaches about my situation, and they recommended "CrossFit Lite." This class is anything but light; it is a modified program for people with physical challenges or injuries, a class for those who are older than the average CrossFitter, and for those who may need additional scaling options.

I started CrossFit Lite on July 8, 2011, one year to the week from my bicycle accident. I was absolutely terrified, nervous and skeptical. After watching my partner in some of her classes, I couldn't imagine how I was going to participate in this program when I couldn't even carry a gallon of water from the basement or push the lawn mower. And I was still so fearful of falling.

I have lost 43 lb. and discovered muscles in places I never knew existed—and somehow I have had fun doing it.

But I can't say enough about how welcomed I felt during that first class. The coaches and members were so encouraging. And slowly but surely I learned how to do the movements. I gained confidence in my abilities and ever so gradually added weight to the bar, began to jump instead of step up to boxes, and even stopped being so afraid. CrossFit nursed me back to health.

I was sore, but I learned that there is a difference between a good sore and injured sore. The coaches helped tremendously in making sure I was never in jeopardy of injuring my wrists. They were patient, supportive, creative and always pushed me to do more.

One of my coaches was fond of evoking Eleanor Roosevelt and told me to do something that scared me every day. That wasn't a problem.

Reflections after one year

From that first class to now, a full year later, I have lost 43 lb. and discovered muscles in places I never knew existed—and somehow I have had fun doing it. I cannot believe what I am able to do.

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In the last year, I ran my first mile since the late 1980s and rowed my first 3K in a workout. I back-squatted 80 lb. for the first time, and I can now do box jumps on a 16-inch box. I can do band-assisted pull-ups, modified push-ups, and all kinds of presses, snatches, thrusters and cleans that I never thought I would be able to do. In fact, I never even considered trying. I have done CrossFit in Texas, Illinois and California. I participate in regular CrossFit classes and feel comfortable scaling for my abilities.

CrossFit has enhanced my strengths, and it has allowed me the humility to keep working on my weaknesses. It has made me a better me, in every way.

One of the highlights of participating in CrossFit is the sense of community and camaraderie. I love the large group workouts, and our owner, Karianne Dickson, always offers holiday classes. It is amazing to have 60 or 70 members all working out together on Thanksgiving or on Christmas Eve morning or hitting Murph together on Memorial Day.

Beyond all the strength, endurance and physical conditioning is the confidence I feel today. Not only does CrossFit train my body, but it also trains my mind.

The coaches at Guerilla Fitness CrossFit Morristown are such a large part of this. It's hard to put into words the depth of wisdom that twenty- and thirtysomethings have to offer fiftysomethings, but they offer it indeed.

They inspire and motivate me every day. They model so well the kind of integrity, courage, tenacity, and kindness that CrossFit encourages. It's contagious and I think we all end up being better people outside the box because of what we learn inside.

I also notice a mental toughness that I didn't have before. I can push myself more than ever. On a recent vacation, I snorkeled, jumped in and out of a kayak, and took a doors-off helicopter ride. I now find myself more likely to attempt something challenging rather than assume that I'm not capable. CrossFit has enhanced my strengths, and it has allowed me the humility to keep working on my weaknesses. It has made me a better me in every way.

It's never to late to become an athlete.

Just a year ago, the surgeon told me I would never do a push-up. I took great pleasure recently in showing him a photo of me doing a thruster. Someday I will do an unassisted pull-up, and I will actually do a burpee correctly.

While I don't know how many workouts I will be able to RX, I do know that CrossFit is a wonderful prescription for living. Maybe I am finally an athlete after all.

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THE
CrossFit JOURNAL

Coaching as a Skill: Verbal Cueing

Coaching can improve through progressions and practice. James Hobart offers cueing tips and drills to help you communicate with your athletes better.

By James Hobart **September 2012**

All images: Staff/CrossFit Journal

"A trainer trains." —Greg Glassman

Our coaching job might be simply stated as follows: help people move better. But that isn't always simply done. Our efforts to get droopy shoulders more active and wavy midlines stabilized don't always succeed.

While we frequently rely on tactile and demonstrative cues, verbal cues often present the easiest and quickest choice for fixing issues, especially in larger groups. Sometimes they can also be the most misleading. We will bark "more vertical!" "explode!" and "elbows up!" but elbows will drop, torsos will dip forward and poor hip extension will still linger. Even the most sincere desire to coach Billy Badass to his next PR falls flat every once in a while.

As coaches, we want to improve alongside our athletes, and the general prescription for becoming a more effective coach requires experience and practice—and lots of both. A lot can be gained from considering cueing like a high-skill movement. Skills, drills and progressions can be used to refine one of our most foundational coaching practices.

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The Myth of the Golden Cue

Verbal cues can be dispensed quickly to one or multiple athletes, and they provide us with a vast reservoir of good fixes for bad movement. Some are laden with technical jargon, but others—like "jump!"—are simple and brief.

> Fight the urge to use the same cue over and over and over again because it sounds fancy or because nothing else will come to mind.

Cleaning up our own verbal cues first requires an evaluation of how they work. What do we say to our clients? Are our cues good?

Great coaches know the best cues are the cues that work. They should make an athlete take one or more steps closer to better movement—the desired result. The golden cue is just a myth, and you will have as many effective—and ineffective—cues as you will clients.

An effective cue leads to the desired result. Instructing an athlete to pull his or her chest up in order to correct poor lumbar position is most useful when we see the lumbar position improve. Repetition is often necessary. But we need to consider the extreme scenario of unending repetition. Fight the urge to use the same cue over and over and over again because it sounds fancy or because nothing else will come to mind. We have to do better in order to find new ways to communicate useful instruction to our athletes.

The first step is taking a more critical look at the cues we use. Doing so might be difficult in the middle of everything else that happens when we coach, but your athletes bring you video of their movements, so why not try the same thing for your coaching?

A verbal cue combined with a tactile cue is powerful, especially with a new client or beginning athlete.

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Drill 1: Record Your Stuff

Set up a camera and record a few classes you coach. It might be best to focus on classes when you are teaching a skill or new movement to a small group during a warm-up, but any session will do as long as you can hear your voice. The first step during review can be to pick out the cues you use to fix faults. Make a list. Then watch to see how many times you use the same cue. Count the cues. Finally, focus on whether or not the cue you gave made the athlete better, had no effect or made things worse. Did the fix last for a single rep or multiple reps? Be critical and pay close attention. If you kept giving the same fixes and nothing changed, we know we need to start trying something different.

Watching yourself on video can be brutal and discomforting. Deal with it. Unless you have a supporting coach who can give you similar constructive feedback, this drill can be very useful.

Your athletes use videos to fix their lifts—why not use the same method to improve your coaching?

I have tried this drill a few times. Once, it became glaringly obvious I used one and maybe two cues to have an athlete push the hips back first when descending into a deadlift. All I would say to the group was, "Stick your butt back." To me this seemed brilliant—coaching ninjutsu at its plain and simple best. The majority of the time it worked. But because of this one-trick approach, I missed some chances to connect with all the athletes. Every time I watch or listen to that video, it makes me cringe because I looked like a crazy person repetitively barking one cue to an athlete with no change in movement. Einstein knew what he was talking about when he said, "Insanity is doing the same thing over and over again but expecting different results."

Experience and practice can pay large dividends when it comes to coaching. Even after identifying our ineffective cues, we need to find ones that consistently work well. Our best resource is each other.

Growing your cueing repertoire shouldn't be a problem. Get access to other coaches. Exposure to other coaches will provide you with a wealth of information. You will see that many cues can be used to fix the same fault, and some will help improve others. The athletes you coach are unique and will respond that way.

Luckily, this was a point that hit me early in my coaching development. During an Olympic-lifting clinic, I was having trouble helping an athlete improve in pulling his barbell off the floor. He finally told me, "I've been a gymnast my whole life, moving my body around objects and not the other way around. I need you to coach my body into the position, not the bar." This one example can help us realize the vast number of cues available even if we have not learned them yet.

Even if someone hasn't been coaching as long as you, he or she will say and do things you have not heard or seen. "Good artists borrow; great artists steal." That's advice we commonly recite at CrossFit Level 1 Seminars, and it didn't start with us either. Nonetheless, it is potent advice for improving our coaching.

Drill 2: Steal and Borrow

Take your list of cues that you saved from Drill 1. Make two columns: one for cues you use to fix a certain fault, and the second column for different cues that can be used to fix that same fault. Begin by writing down a few alternative cues that you think might work or have heard in the past. Then go watch some other people coach, and add their cues to the list.

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It's important to be constructively critical. Whenever you try a new cue, make sure you evaluate its effectiveness. Does it work on many or just a handful of your athletes? Did it make an improvement, have no effect or make everything worse? From time to time, ask yourself these questions and even repeat Drill 1 to measure your own improvement.

Be conscious of your own repetition and try different cues. Steal them from other coaches.

Keep in mind there is no hard science here. I am sure you have seen many different coaching styles, cues and personalities that are beautifully effective and enjoyable. If the drills listed above appear more limiting than useful, scrap them (that is more advice I can't claim as my own). Simply start by increasing your awareness of how your words and cues reach your athletes.

Just like learning better balance in a handstand, coaching, requires focused practice. Perhaps begin by asking yourself some of these questions before and after you coach:

- Did the cue you used lead to the desired result?
- How many different cues did you use?
- Do you always use the same cue for the same problem?
- How many times do you use the same cue without a change in your athlete?

Be conscious of your own repetition and try different cues (steal them from other coaches). Don't be afraid to ask your athletes if they understand what you mean. Recycle cues that lead to better movement and observe whether or not your own coaching becomes effective.

Saying More by Saying Less

Our bodies do amazing things. From gross motor recruitment to refined metabolic processes, the human body is primed to work extremely well even without us telling it what to do. It's fun to know about our body—it's ours. Knowing about it and watching it do everything it does best is one of the reasons we love our coaching jobs. Once we begin instructing other athletes, however, our enthusiasm can get the best of us. Are the anatomy and physiology factoids always necessary to assist others in moving safely, effectively and efficiently? Simple cues—commonly used words, things and actions—are an excellent starting point.

Likely your clients don't have an exercise-physiology degree, nor should they need one to understand you. Cues such as "squeeze your butt," "jump," "lower," "no," "shrug your shoulders up," "stand faster," or "bring your hands and chest up" will likely be more effective than "externally rotate" or "elevate your scapulae." It's surprising how often we fall into the trap of using unfamiliar terms or simply reciting the points of performance that make up the movement. Even terms like "full extension" can be misleading for new clients and athletes.

Drill 3: In Their Own Words

List the points of performance that you have a difficult time coaching. Next to each point of performance, try to come up with a common word or action that would get the athlete to that position. For example, in the push jerk we need to reach full extension (the point of performance). We recognize full extension when the athlete's body is straight. What cues other than "full extension" might help the athlete understand this? How about "jump," "stand as tall as possible as fast as possible," and "squeeze your butt as you jump"?

To expand your cueing repertoire, watch expert coaches interact with their athletes and instruct proper movement.

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Numerous compassionate coaches with limited knowledge of anatomy and physiology coach their clients beyond sickness back into fitness. That's not an excuse to skip out on Anatomy 101. Know your stuff. Nevertheless, keep in mind that at first your clients likely wont know and don't need to know everything you do. They don't want a Ph.D.; they want to live a better life. Cueing effectively occurs with simple cues. Here's more great advice I heard from another Level 1 Staff member, Joe DeGain: "Have the knowledge of an exercise physiologist but be able to present it like a gym teacher."

Location, Location, Location

Experience doesn't play fair; she is a cruel teacher in giving the test before the lesson. Our simple cues won't always work, even when we try new ones by seeking out what's effective and what isn't. One useful drill (discussed below) I wish I could take credit for was learned at a CrossFit Coaches Prep Course last year. Remember: good artists borrow and great artists steal.

When we instruct clients to get their weight in their heels, we are delivering a simple cue. However, cues like that one, which only tell the clients the desired result, don't specifically tell them how to achieve that result.

Consider using direction cues in your coaching: "Move your torso toward my hand."

We can refer to these types of cues as "result cues." They are similar to repeatedly telling your friend to come over to your gym without giving him directions. When he doesn't show up, you call him back and tell him to come over to your gym and then hang up the phone. Your friend, just like a new client, needs to know both the destination and the directions.

During the Coaches Prep Course, we learned to tie a body part to a direction, location or object. "Push your heels down" and "push your butt back" are cues that include directions for getting weight back into the heels.

This isn't an exact science, and these direction cues might not be more effective than the result cues. But they might provide your client with more specific instructions to move better. Watch someone else coach to begin identifying the difference between the cues. Listen for a body part tied to a physical direction.

Drill 4: Point and Click

Consider the following cues listed below and identify which ones direct a specific body part to a location. Which ones don't do that?

- "Pull your arms above your head."
- "Push your knee to my hand."
- "Keep your arms straight until you stand."
- "Tighten your lumbar."
- "Push your knees forward."
- "Get off your toes."
- "Keep a straighter bar path."

All the above cues sound simple and useful, but which cues include both a body part and a direction? Are the cues that instruct a specific body part to move to a specific direction more effective for you and your clients? You might discover that newer athletes lacking body awareness have more difficulty knowing which muscles and body parts are required to get off their toes, tighten their lumbar or straighten out the bar path. It's our job to help them out.

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This method won't work every time, and at first it can be difficult to tell the difference between cues that identify the correct position and those that tell us how to get to the correct position.

> Through practice and hard work, the time will come when you can coach 20 athletes as effectively as you can coach one.

In February, we ran a handful of Level 1 CrossFit Seminars at Ft. Stewart, Georgia. Many of the athletes who came through were familiar with functional movements but unfamiliar with our jargon and points of performance. This communication gap in my own coaching became very clear when, after three or four unsuccessful cues during a deadlift—"Get your weight in your heels!"—the young woman I was coaching told me, "I don't know what you mean. And I don't know what that feels like." Asking an athlete to shift weight to their heels seems relatively simple. And the concept behind shifting weight to our heels is fundamental for many of our movements. What cues could we use in this case? Why?

Drill 5: Ask Yourself Questions

Here are some questions to consider:

- What is the fault that I want to correct?
- What do I need to see the athlete do in order to see that the fault has been fixed?
- What body parts have to move in order to stop the fault?
- Where do those body parts have to move?
- Was the fault fixed?

If the bar is not in the ideal overhead position in a press, which body parts need to move in order to correct the problem? Which body parts need to be active to maintain the correct position?

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Begin writing out a single fault outside class, and then answer the questions. We can learn some new cues simply by practicing the method. What we also learn from this drill is that different body-part/direction cues can fix the same fault. For example, "push your hips straight back," "curl your toes up," "straighten your legs" or the simple "press your heel to the floor" can assist in returning weight to the heels.

This is awfully formulaic at first, but it becomes easier with practice. More importantly, you will likely find your own methods to cue effectively, and eventually you'll learn to find those methods quickly. Returning to our earlier example, we can walk through Drill 5 with more complicated faults as well. Useful drills and tips will present themselves in unexpected ways throughout your professional coaching career.

When possible, apply these drills on your own before implementing them in the gym. Take small steps: begin working with a single athlete before a few and a few before a whole class. Perhaps the most wonderful side effect of becoming a more effective coach is creating a self-sufficient group of athletes. Yes, your athletes will learn how to cue, help and coach each other. The benefits of such an environment are invaluable. Keep focus on the methods that can improve our approach to make learning a better experience for all athletes.

"Have Fun Screwing Up" —Coach Greg Glassman

In On Being a Trainer, Coach Greg Glassman tells an early Level 1 Seminar, "When I am in your face it's only 30 percent of the time to tell you how wonderful you are, and the rest of the time I will ask why can't you stay on your heels, why did you lose your arch? where are you shoulders? don't look down—look up."

Forget that your clients must be perfect today; our goal is to become better for tomorrow. Start small and be patient. Through practice and hard work, the time will come when you can coach 20 athletes as effectively as you can coach one. Along this journey, have fun screwing up.

We are convinced that better technique will help bring our athletes closer to fitness, and cueing effectively remains only one small piece of becoming a great coach. Our passion and enthusiasm for better human movement can be tempered with time and practice, and we must balance our own coaching technique and intensity to become more effective.

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About the Author

James Hobart is a CrossFitter. He has been coaching CrossFit for nearly five years and works as a head trainer for CrossFit Level 1 Seminars. He received his J.D. from Suffolk University Law School in 2011 and will be sitting for the Massachusetts Bar in 2013. He would like to thank all the coaches who have been generous enough to share their knowledge and teach him along the way, especially the entire CrossFit Level 1 Seminar Staff.

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THE CrossFit JOURNAL

Serving a Community in Crisis

Teacher Chip Johnston starts a CrossFit affiliate in one of the nation's most impoverished states and offers free classes to all students and teachers of the Milwaukee Public Schools system. Emily Beers reports.

By Emily Beers **September 2012**

All images: Chip Johnston

In some ways, CrossFit MPS will be just another CrossFit affiliate: it will seek to get people more fit than they have ever been in their lives.

On the other hand, CrossFit MPS, which stands for Milwaukee Public Schools, will be anything but just another CrossFit box.

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Its founder and head coach, Chip Johnston, explained it best in his application essay to become affiliated.

"I am sure the events that have led me to write this essay explaining why I would like to open a CrossFit affiliate are both ordinary and extraordinary," he wrote. "The reason I know that they are in part common is because the combined experiences that led me to the discovery of CrossFit, and how it has changed my life, are largely the same as those that come out of thousands of CrossFit affiliates and are retold countless times on CrossFit's online discussion boards. However, the reason I know they are in part uncommon is because of my vision of how CrossFit can serve in many different ways a community that is not in need but rather in crisis."

The community he was talking about in his essay is Milwaukee. The crisis he was referring to is the growing number of impoverished, nutritionally misguided, overweight, out-of-shape high-school students in the city. And Johnston's idea of serving others has become the backbone of CrossFit MPS, a nonprofit affiliate.

Johnston, who is a full-time teacher at MacDowell Montessori School, will volunteer his time and offer free CrossFit classes to all students and teachers of the Milwaukee Public Schools district starting this month.

> "When I saw the success that I had through CrossFit, I felt obliged to pay it forward."
>
> —Chip Johnston

The Why and the How

Johnston considers himself one of the lucky ones. He had a blessed childhood, with parents who encouraged him to get involved in sports as often as he could.

Eventually, he found himself playing college soccer at the University of Wisconsin. After graduation—like many others—he let his fitness slip, quickly seeing his body decline from fit to unfit.

"There was a serious reduction in activity and (an increase in) the decrepitude that accompanied it," said Johnston, who gained 40 lb. after college.

Johnston comes from a family of teachers and considers it his obligation to help others.

Luckily, he soon found CrossFit, which nursed his body back to health. Suddenly, he was once again inspired by what his body was able to do. And more importantly, he was inspired by the way his overall health improved.

When Johnston started teaching in Milwaukee, he immediately noticed the festering problem around him, a crisis of health and fitness that was growing bigger and bigger. The vast majority of the students who attend MacDowell Montessori School are considered underprivileged, which only makes them greater targets for poor nutrition and fitness, Johnston explained.

"If you came into our classrooms, you'd see backpacks full of stuff that comes in plastic bags. You'd see chips and soda. And you'd see the obese children," he said.

Johnston added: "Wisconsin is the fourth-most-impoverished state in the United States at the moment. Most of my students are fed government-subsidized lunches every day, usually made up of processed food. Fitness isn't a priority for most of them."

Johnston, who comes from a family of teachers, said he felt compelled to help.

"My mother always told me that everyone benefits from the well-being of everyone else," said Johnston, who is a social-studies teacher and the International Baccalaureate coordinator at his school.

"I think service is so important, not just with schools, but in general. That's the way the U.S. is going to get better … is through people who are service-oriented. And when I saw the success that I had through CrossFit, I felt obliged to pay it forward."

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This ordinary-looking space will soon be the home of extraordinary fitness.

And so began the concept of CrossFit MPS.

The next step for Johnston was to write a grant application to fund the training and equipment required to open CrossFit MPS. And, of course, he had to apply to CrossFit Inc. for affiliation. As Coach Glassman has said, wanting to serve others is an important part of being a CrossFit affiliate, and the MPS application was accepted.

> "We basically took over the weight room at the school, threw out all the machines and crappy equipment, and placed a big order with Rogue Fitness."
>
> —Chip Johnston

By June 2012, all the paperwork and technicalities were out of the way. Everything was approved and the wheels were in fast motion. Now it was time to transform the basement of his high school into CrossFit MPS.

"We basically took over the weight room at the school, threw out all the machines and crappy equipment, and placed a big order with Rogue Fitness," said Johnston, who spent his summer getting CrossFit MPS ready for its grand opening this month.

On top of physically preparing the space, Johnston devoted countless hours to creating warm-ups and coming up with programming ideas, visiting other CrossFit affiliates in the area to observe classes, and building the CrossFit MPS website.

"I don't know if I could put a total number of hours on it, but I worked on it most days. None of it ever felt like work because it's something I'm so passionate about," Johnston said.

He said he can't wait for it all to begin. He has been letting people know about his new space all summer by sending emails to students and staff to prepare them for CrossFit classes this fall.

"The plan is to start out small. I'm assuming we're going to have mostly people from our school at first, but eventually we want to have kids from other schools, too," he said. "But I don't want to take on more people than we can coach properly, so I'd like to see slow growth."

If all goes well, Johnston might not be able to keep up with the potential demand. The Milwaukee Public School district has 80,000 students and 6,000 employees to draw from, so Johnston might very well find himself opening another affiliate in the near future to make room for the bodies.

For now, Johnston is simply hoping to inspire the students at his school to take control of their health at a young age.

His vision for CrossFit MPS is to see both students and teachers embrace the concept of gaining extraordinary fitness. And if all goes well, one day this extraordinary fitness will simply feel ordinary in Milwaukee schools.

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About the Author

Emily Beers, a CrossFit Journal staff writer, finished a master's degree in journalism at the University of Western Ontario in the spring of 2009. Upon graduation, she worked as a sportswriter at the 2010 Vancouver Winter Olympic Games, where she covered figure skating and short-track speed skating. Currently, she hosts ***WOD HOG****, a not-always-PG publication of the CrossFit Vancouver School of Fitness. She ruptured her Achilles tendon in December 2010 and served as the Canada West Regional Media Director while recovering from surgery. Beers also competed in the 2011 Reebok CrossFit Games on CrossFit Vancouver's team. She finished third at the 2012 Canada West Regional.*

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THE CrossFit kitchen KIDS

Sweet Cheeks Headquarters

QUICK AND CRUNCHY

by Shirley Brown and Alyssa Dazet
Sweet Cheeks Headquarters

overview

Feeding your family can seem like a full-time job sometimes. You want your kids to eat healthy, but you also want some time to do the other 549 things on your to-do list. When time gets tight, whip up these quick-and-easy celery snacks.

makes 1-2 kid servings

ingredients

2 stalks celery

4 slices ham

1 tbsp. mustard

notes

Substitute different kinds of lunch meat and dipping sauces for added variety.

directions

1. Clean the celery well, chop the ends off and cut it in half width-wise.

Option 1: Take one piece of ham and roll the celery stick up inside. Use mustard for dipping.

Option 2: Fill the inside of the celery with mustard. Roll the celery stick up in one piece of ham.

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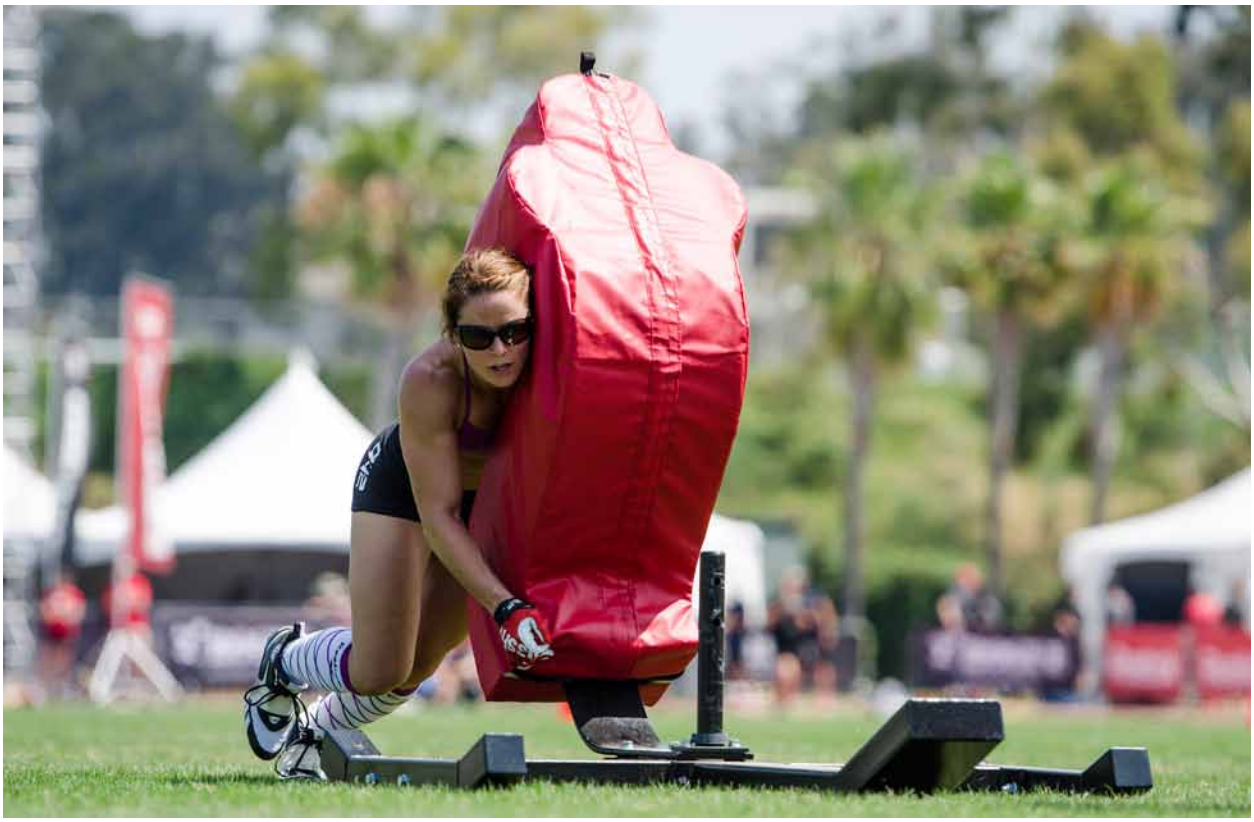
THE CrossFit JOURNAL

Angles and Demons

Managing stress, anxiety and fear is part of being an elite athlete. Andréa Maria Cecil talks to CrossFit Games competitors and coaches who share their various approaches to fighting inner battles.

By Andréa Maria Cecil **September 2012**



All images: Staff/CrossFit Journal

You have two choices: continue to wallow or do it again.

"In most situations, you need to challenge fears and redirect to what you can control," said David Yukelson, director of sports psychology services for the Morgan Academic Support Center for Student Athletes at Penn State University.

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Don't allow frustration to undermine confidence, he continued—it can become obsessive and nagging self-doubt. Yukelson calls it "stinkin' thinkin'."

"Right then, you need to use mental-preparation techniques," he said. "That's when you have to fight back and be resilient."

In other words, have a plan for composure.

"And a lot of coaches don't think enough about that," Yukelson added. "This is a skill."

> "I was never really scared. It was just, 'I hate this.' I was irritated."
>
> —Heather Gillespie

"Oh, Whatever. Get It Done."

Heather Gillespie compared the swim that started this year's CrossFit Games to childbirth.

"I cried because I knew I had to get it done, but I had no other choice," she said. "You get it done and it's still horrendous."

The athlete from Lethbridge, Alta., doesn't exactly like water. She doesn't fear it; she just finds it highly unpleasant.

"It's really irritating to me. I don't like the water. I don't know how to swim," Gillespie explains. "I go boating. I don't get off the boat."

And taking showers—with water spraying on her—is out of the question.

"I always take a bath," Gillespie said.

Still, the thought of withdrawing from the Games because of the 700-meter swim did not enter her mind.

Yes, she cried, but she was going to do it no matter what—despite her equal loathing of workouts that take longer than five minutes.

"It didn't take too much convincing. I was never really scared. It was just, 'I hate this.' I was irritated," Gillespie explained.

At that point, she devised a mental plan: focus on what it will feel like when it's over and try to keep emotion out of it.

"I do have an OK time shutting down. And maybe that's what makes me OK physically with CrossFit," Gillespie said. "I don't feel sadness."

Instead, she tells herself, "Oh, whatever. Get it done."

The worst that could happen, Gillespie thought, was she might not finish.

"And in the end, that's not that bad," she said.

Gillespie finished both parts of the swim-bike-run at Camp Pendleton in 43rd place.

And even though she said exposure is the best way to vanquish such a goat, she won't be practicing her swimming.

"I might spend a little time, but, like I said, I hate that water and that's that. I will take my chances," Gillespie said. "I know that doesn't sound like competitive nature."

If swimming appears at the Games for a third time in 2013 and Gillespie makes it back to the event, she said she'll deal with it.

Heather Gillespie made it through the Pendleton race to get back to her comfort zone of brutal, barbell-based chippers.

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"Nothing is ever as bad as (what your mind) makes it," Gillespie said. "I feel like I can do anything. Throw me something I can't do … I'm not going to be the fastest, but I know my mind and body is stronger than any challenge. And that's the power of CrossFit."

"So, Yeah, I Tried"

Like Gillespie, Deborah Cordner Carson didn't like the water.

She, however, feared it.

At last year's Games, the former collegiate sprinter from Minnesota withdrew from the competition because it started with an ocean swim. This year, it was déjà vû.

So when Games Director Dave Castro announced the surprise swim-bike-run event, Cordner Carson tried not to think about it. But once she got back to her hotel room with people she felt comfortable expressing her emotions around, fear began consuming her.

The day before the event, Castro and Marine Capt. Greg Johnson from Camp Pendleton briefed athletes on what to expect. Johnson talked about rip currents, rocks, sharks and other dangers.

"They made it sound horrible," Cordner Carson said. "Everybody was kind of laughing, kind of scared. … I don't think anybody took it to the level I did."

On the day of the event, Cordner Carson was all but ready to withdraw. But as she talked to one CrossFit employee after another, each one said the same thing: "You can do it."

Cordner Carson won the Spirit of the Games Award for the courage and determination she showed in the ocean swim.

"No one would let me quit. That's what it felt like," Cordner Carson said. "At one point, it felt like, 'You can't make me do this.'"

> "I can do it. It's going to be hard, it's going to be really sucky, but it really won't be that bad."
>
> —Deborah Cordner Carson

She spoke with CrossFit staff member Angel Forbes, who said she should talk to Castro. During a quick meeting on the beach, Castro told her she had to try. The talk seemed to do the trick.

"I was like, 'Yeah, I'll try. What the hell, Deborah? Try.' So, yeah, I tried," Cordner Carson said. "I took it one step at a time—literally. I got into the ocean very slowly and tentatively."

She was dead last on the swim and didn't care.

Cordner Carson made her way through the ocean "one little tiny stroke at a time."

Between the third and fourth buoy, she could see the other competitors hopping on their bikes.

"I couldn't believe I was actually going to make it," she said.

The experience gave Cordner Carson confidence not only in tackling open water but also life's other difficulties.

"I can do it," she said. "It's going to be hard, it's going to be really sucky, but it really won't be that bad."

Her advice: take it one step at a time.

"I Wanted To Do Well For Him"

Seeing Lindsey Valenzuela before the Clean Ladder at this year's Games has been described as laying eyes upon "a caged beast."

Beneath the Home Depot Center, she paced in the tunnel where athletes waited to enter the competition floor. The 25-year-old appeared confident as she eyed the sea of bars. The audience expected her to be the first woman to finish the ladder at 235 lb. Valenzuela delivered to the cheers of the crowd.

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That confidence, she said, doesn't always come easy.

"I for sure don't always feel confident the days leading up to a competition," Valenzuela said. "I think the biggest fears I have are not achieving the goals I have personally set for myself—(whether) it be going unbroken (in) a movement, getting a certain time on a workout or just where I want to place."

> "I also think about everyone who has believed in my dreams and also everyone who has told me I couldn't accomplish my dreams."
>
> —Lindsey Valenzuela

Valenzuela's solution: family. Talking to family members about her anxieties and fears helps to release the tension, she said.

"Once they are talked about I always feel better and more confident," Valenzuela said.

On game day, she focuses on her plan of attack for each workout.

"I also think about everyone who has believed in my dreams and also everyone who has told me I couldn't accomplish my dreams," Valenzuela said. "Those two components give me the right mixture (of) confidence and anger that I need to be fired up before a workout."

Many of her doubts come during long endurance workouts, said Valenzuela, who comes from a volleyball and weightlifting background. The Southern California athlete snatches 195 lb. and clean and jerks 235 lb.

"When I'm training or I'm in the middle of a competition, I think a lot about my family; my husband, Arsenio; and my 92-year-old grandfather," Valenzuela said. "They are the people who have always believed in me and gotten me through hard times."

During the swim-bike-run event, she said she only thought of her grandfather.

"(He) was the only thing I carried in my heart … because he was in the service and trained on Camp Pendleton back in the day," Valenzuela said. "I wanted to do well for him and all current (and) past service men and women. I felt honored to be competing on their training grounds."

Likewise, she also thinks about the people wearing "Lift like Lindsey" shirts "and how important their support is to me."

She said: "I want to show them that if I can do it, so can they."

Coach's Perspective

For Doug Katona it's about one thing: listening.

"You really gotta listen to your athlete," he explained. "Start to understand who they are, understand how they react in their life."

Valenzuela pushes aside fear and anxiety by visualizing the support of her family and fans.

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Understanding the source of an athlete's fear is the first step in overcoming pre-competition anxiety.

Katona, of CrossFit Endurance and UnScared Inc., coaches several Games athletes, including Bryan Diaz, Jeremy Kinnick, Guido Trinidad, Becca Voigt and Heather Welsh.

> "Sometimes they go to a place that even the best psychologist can't get them out of."
>
> —Doug Chapman

Some prefer visuals, others prefer affirmations, some need to talk, others listen to music, and there are those who just need to be comfortable.

"My athletes report to me every single day," Katona said. "Even looking at how they're responding to email and how they're communicating (are) cues to pay attention to."

Coaches must prepare their athletes for all scenarios—and that doesn't just mean competition, but everything from sleeping in a hotel bed to eating in different places.

He advises athletes to focus on what they can control during competition.

"Things that you can't control, you can't control," Katona said. "Athletes get into perception thinking of what's good or bad."

Coaches, meanwhile, must be the rock.

"What I tell coaches is, 'Don't get emotional to the emotion,'" Katona said. "As a coach, you've got to be calm, you've got to be level-headed in your thinking, you've got to be clear."

A coach must understand from where the fear is coming: anxiety, stress, fear of failure?

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"It's truly individual when it comes to that," he added.

Meanwhile, Doug Chapman, who coaches Shana Alverson and second-place Games finisher Julie Foucher, called his approach "holistic."

"I have regular warm-up routines before training or a workout. Part of this is it warms up the body, gets people ready to train," he explained. "At the same time, it's a comfort zone."

> A coach must understand from where the fear is coming: anxiety, stress, fear of failure?

Both Alverson and Foucher warm up at the Games in the same manner they do at home.

Chapman explained it as "that ritual of how you walk, how you conduct yourself."

The former wrestling coach and owner of Hyperfit USA in Ann Arbor, Mich., said he sees CrossFit athletes more than others succumb to "a defeating process."

When that happens, he first tries comic relief.

"I'll make an idiot out of myself, make them laugh," Chapman said.

But there are moments when he can be of no help.

"Sometimes they go to a place that even the best psychologist can't get them out of," Chapman said. "Human beings are strange creatures."

The mental side of coaching is the most challenging, he added.

"Every time I have a chance to buy a book about the mental side, I do," Chapman said. "There's no single method to getting to the athlete."

Yukelson would agree.

"Every person, every situation is a little different," he said.

Getting athletes to challenge their fears is key. Like Katona, Yukelson said it begins by the athlete focusing on what can be controlled.

"The big thing in controlling it is identifying it and almost slapping the fear in the face," he explained.

Athletes need to stay focused on what they're going to do and not worry about what could go wrong, Yukelson said.

Simple self-talk can help. That could be checking in with yourself every mile during a run or repeating mantras to yourself, he added.

Yukelson advised thinking of this as "ammunition to be able to fight back" or "the opportunity that I've been waiting for."

"It can be dealt with," he said. "But the person has to have the willingness to address their fears."

Coaches, Katona said, need to be better prepared to teach athletes the skills to combat mental breakdowns.

"This is the missing part of coaching right now," he said. "You gotta know what's going on elsewhere to find that balance. … That's what we're here to do is serve athletes."

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Courtesy of Andréa Maria Cecil

About the Author

Andréa Maria Cecil is the Regional Community Media Director for the Australia, Europe and North East regions. She was also the North East Regional Media Director for the 2012 Reebok CrossFit Games. Cecil has been a freelance writer and editor for the ***CrossFit Journal*** *since 2010 and also writes for the CrossFit Games site. She spent nearly 13 years as a professional journalist, most recently as managing editor of the* ***Central Penn Business Journal*** *in Harrisburg, Pa. The 34-year-old is a native of New Orleans who lives in York County, Pa. There, she's been doing CrossFit since 2008 at CrossFit York, where she coaches Olympic weightlifting as a USA Weightlifting Level 1 Sports Performance Coach. Additionally, Cecil dedicates four days a week to training the Olympic lifts herself at McKenna's Gym.*

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THE CrossFit LIFE

Fit Forever

Chris Long started out with a goal of being fit by 50. Then he discovered CrossFit and found a new goal: he wants to be fit now—and forever.

By Chris Long **September 2012**

Courtesy of CrossFit Fresno

What in the world am I doing? I of all people don't belong here … I am not an athlete in any sense of the word!

Those negative thoughts raced through my head over and over, with a few expletives for good measure, as I walked into CrossFit Fresno in December 2011 to start my first foundation class. I was the king of excuses when it came to taking care of myself physically. Too tired, too much work to finish, too fat, too much to do at home and on and on.

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Jeffrey Sherman

The author before (left) and after CrossFit.

What in the world am I doing? I of all people don't belong here … I am not an athlete in any sense of the word!

My health was at its worst. I took pills for all sorts of things. The blood-test results from my physical in December were not good, Not to mention I weighed 256 lb. I was snoring like a freight train at night. I woke up frequently, I'm sure because I had sleep apnea. I would drive to work so tired I felt like I could fall back asleep.

What in the world am I doing? I of all people don't belong here … I am not an athlete in any sense of the word!

Before walking in, I spent several minutes in my car contemplating driving home instead. But there I was, filling out a waiver, figuring out how to answer a question about my current non-existent workout routine and looking through a window at the 5 p.m. class lifting all sorts of weights and tossing medicine balls high in the air.

What in the world am I doing? I of all people don't belong here … I am not an athlete in any sense of the word!

Rosanna grabbed my waiver and immediately noticed I left the workout-routine question blank and asked me pointedly, "Well, what's your current routine? You left that question blank." She caught me right away!

I sheepishly told her, "Um, I walk my dog in the morning and at night."

She said, "Then put it down. That works."

What in the world am I doing? I of all people don't belong here … I am not an athlete in any sense of the word!

I soon had my butt in the seat of the rowing machine, learning how to move my legs, rear and arms in a fluid movement. That was comical.

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"Where's the elliptical machine?" I thought. "That one's easy for me to figure out." Then there were squats.

"Yikes, Jon, what do you mean, 'Go lower'?"

And push-ups, I think I did my last push-up in eighth grade to earn my Presidential fitness patch. That was 1978.

What in the world am I doing? I of all people don't belong here … I am not an athlete in any sense of the word!

I kept coming, barely making it through the foundations classes. I couldn't even run around the first half of the parking lot without stopping two times. Rosanna ran with me, stopped with me, talked with me and encouraged me to keep pushing through. The final chipper almost did me in. I remember jumping rope was so hard. I did one every 10 or so seconds. But I made it through and was ready to graduate to the daily classes.

I was extremely apprehensive about doing the daily WODs with the true CrossFitters. How would I keep up? What I found was a community at CrossFit Fresno that is not like anything I'd experienced before.

New thoughts began replacing the old ones.

I can't wait to go to CrossFit Fresno. I of all people belong here, and I am an athlete in every sense of the word!

Courtesy of CrossFit Fresno

Long lost 75 lb. and discovered a supportive, welcoming community at CrossFit Fresno.

Everyone was so nice, encouraging and helpful. I couldn't wait to come back each day. The endorphins started kicking in. I quickly moved from three days a week to six. My new addiction quickly spread to my wife, Kathy. She was soon on her CrossFit Fresno path, and it opened up a whole new facet to our relationship.

I can't wait to go to CrossFit Fresno. I of all people belong here, and I am an athlete in every sense of the word!

Conversations at the box led to information about the Paleo Diet, so my research began. Kat and I decided to give it a try. It made so much sense. I'd sought out the wrong food for years. It was rough, but I knew my sugar addiction needed to stop, and I needed to know how to make smart food choices so that it all worked in conjunction with my exercise. Paleo has clicked with me ever since starting to eat that way in January.

I can't wait to go to CrossFit Fresno. I of all people belong here, and I am an athlete in every sense of the word!

The relationships I've developed at the box over the last eight months have been so special to me. Jon, Rosanna and each and every member of the CrossFit Fresno family have made a huge difference in my journey. I started out with the mantra that I wanted to be "fit by 50." I gave myself two years. But I have come to realize that my mantra is actually that I want to be "fit forever." And I will be, thanks to CrossFit.

I can't wait to go to CrossFit Fresno. I belong here, and I am an athlete in every sense of the word!

I had my blood work rechecked recently, and what was a wacky bunch of numbers is now perfectly normal. I'm off all the medications I was taking and as of this morning have lost 75 lb. I've gone from 256 lb. to 181 lb. I feel the best I have ever in my life, and it just keeps getting better with each WOD.

Jon, Rosanna and everyone at CrossFit Fresno, thank you from the bottom of my heart for being my fellow athletes and for your constant encouragement. I'm there for each you as well along your journey and truly enjoy our time together inside and outside the box.

I can't wait to go to CrossFit Fresno. I of all people belong here, and I am an athlete in every sense of the word!

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THE CrossFit JOURNAL

Mastering the Art of Self-Defense: A Beginner's Guide to Pistol Combatives

E.M. Burton is introduced to firearms over a two-day combative pistol course and learns a lot about weapons, self-defense and fitness.

By E.M. Burton **September 2012**

Tyler Northrup

I saw a picture on Facebook the other day of two possible responses a woman has to a violent attack. In one, the woman is cowering in terror, arms above her head in an attempt to shield herself in what we can only guess will be a losing battle.

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In the adjacent image, we see the same woman with a calm demeanor, head high, eyes open and fixed at close range, her hands firmly gripped on a pistol aimed at her threat. Her finger is on the trigger.

Which woman will survive this attack?

Betting folks will go with the gun.

> The responsible person who wants to know what the fuck to do with a gun takes a course.

I've awoken in the middle of the night to find an intruder in my darkened home. I managed to utter one word in a firm and low voice: "Leave." I was lucky; he did. Had he not made that choice, I likely would have had to wait out the seemingly interminable minutes it would have taken for help to arrive, if indeed I was able to make the 911 call.

What if I hadn't been so lucky?

The Gift of the Gun

"Happy Birthday! Here, have a weapon!"

Working for CrossFit Inc. means there is always something unknown and unknowable around the corner. But nothing prepared me for the staff birthday gift I received this year: a Smith & Wesson Model 340 .357 five-shooter. "Magnum," they call it.

There were options. I could have elected to take a gift certificate for this or that, a camera, perhaps, to equip myself for shooting well on another level. But no, the badass in me decided to say, "Sure. Bring it."

The following week I thanked our fearless leader, Coach Greg Glassman.

"Hey, thanks for the weapon!"

He replied, "You did not take the gun, did you?"

He was probably thinking that only the really cool kids—the likes of Dave Castro, Nicole Carroll, Jeff and Mikki Lee Martin—would take him up on something called Magnum.

All images: E.M. Burton/Tony Blauer

If someone gives you a gun for your birthday, you better figure out how to use it.

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Full disclosure: I'd never seen a gun, never touched one.

Now what?

The responsible person who wants to know what the fuck to do with a gun takes a course. A really, really good course. As my decades of post-secondary education should hopefully demonstrate at the very least, I know how to pick a good teacher, and I planned on doing so.

The week after I received the gun, I was on Facebook and saw a photo of Tony Blauer of Blauer Tactical Systems and CrossFit Defense. The photo showed Blauer shooting during a combative pistol course, with a brass shell in mid-air. It was so cool. Lacking all common sense and throwing just about everything to the wind, I commented: "Awesome. Where do I sign up?" or something to that effect.

The die was cast, and the thing had a momentum beyond my control right from the beginning.

As I boast, I can pick a good teacher. And so can Tony Blauer. Trident Concepts is a going concern out of Austin, Texas, owned by a former SEAL by the name of Jeff Gonzales. It's the only "shooting" school I've come across that actually collects data points of its students and tracks performance and progress to be able to assess increasing capacity, noting areas for improvement. Now, what does that sound like? It was a very good fit.

The only thing was that Gonzales trains the best of the best. In hindsight, I think he teaches "level ones" as a sort of community service. The vast majority of his students are top soldiers, elite members of the special-operations community. These people already know the parts of the weapon, its safe handling and operation.

With his first available Combative Pistol Level 1 scheduled for late spring, I engaged the man in a conversation about availability. He suggested and I agreed that given my level of fear (oh, yes, back to that), perhaps a private session would be best anyway. That way, at least—I reasoned quietly to myself—I wouldn't shoot anyone else on the range by mistake.

Certainly interested in taking responsibility for my personal safety, I was still afraid of potential attackers. But I was also afraid of myself with a weapon, in much the same way as someone with a fear of heights is at heart really just afraid that he or she will jump.

Never having held a gun, the author worried she would miss the target entirely.

As the days narrowed between the enthusiastic, cocky, "Sure! Let's go shoot some shit!" and the "Oh, God, I have to go hold a gun and shoot something," my anxiety about the whole thing escalated. Even though I live an hour from the shooting range and, as Jeff astutely pointed out, I wouldn't have to deal with the additional stress of flying with my weapon, I was worried about all kinds of things. In retrospect, I think I was mostly worried I wouldn't be able to hit the target.

Like, at all.

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The Way of the Gun

It turns out that Tony Blauer and Jeff Gonzales are friends of more than 15 years, both of them successful coaches, teachers and business owners in the field of self-defense for decades, which is actually quite a rarity. And, oh yes, they were introduced by Dave Grossman. That's Lt. Col. Dave Grossman to you, for those of you out there who, like me, should be way more intimidated by the company I keep. But that was just the beginning.

Gonzales suggested we invite Blauer along for the two days of shooting. *Yes!* I was thinking. Not only would Blauer be extremely kind to me and also add incredible knowledge about the relation of CrossFit methodologies to pistol combative training, but another body would also take the focus off me and distract everyone from what I was sure would be an epic fail on my part. Then Blauer suggested we also invite "Cliff." Sure! Let's bring Cliff. As I say, one more person might distract attention from my incredible incapacity. Then I got a brief backgrounder on Cliff that included "Marine" and "LAPD," but I didn't get Cliff's last name. Had I, I likely would have been so freaked out I might have been a no-show.

Jeff Gonazales says people who are used to complex movements have the biomechanical control and muscle memory necessary for success with a weapon.

On the drive up to the range, the following thoughts went through my head: *What am I doing? Omigod. I won't be able to do this*. Then I reasoned with myself. Gonzales, a man who is more than thorough in his method and nothing if not kind and courteous, has reassured me that I'll be fine and will have fun. Clearly, he's a coach well suited to my mentalité, so I tell myself to stop being such a wuss and get over it. There are fears and then there are fears. I'm afraid of failing, sure, and I'm afraid of the power of the weapon, but I'm more afraid of the circumstances in which I would find myself in need of such a thing. Enough internal dialogue. I soldier on.

Gonzales explained that the majority of students get into firearms without any fitness and then realize they need to be more fit.

In the weeks leading up to the course, Gonzales and I had a few telephone conversations.

"Learning how to fire a weapon is like performing a snatch. There are complex movements that, when broken down and put together, lead you to progress toward the end result: being able to perform the movement flawlessly," he said.

We discussed the advantage he's noticed that CrossFitters have over all others during the rigorous and specialized training he offers.

Gonzales explained that the majority of students get into firearms without any fitness and then realize they need to be more fit. Because of CrossFit's popularity and the seemingly increasing danger of the world, he is beginning to see more students who have a greater capacity for success in his courses. These are people with greater muscle memory and sharper biomechanics. With better muscle control, one can follow the commands more effectively, and the incline of progress is steeper.

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We also discussed "gun cultures" and "non-gun cultures." I am derived decidedly from the latter and—so I learn—have generalized fears about the sheer power of weapons, en masse. Most interesting for me was that this was my first real introduction to the warrior mindset. The ultimate act of heroism and courage for me has always been the one in which a person will sign up to take on the responsibility to protect of the lives and freedoms of others, but I've never been able to fully comprehend why someone would want to.

I know that the privileges I have had my entire life come at a great price: freedom of speech, freedom of religion, freedom to pursue a higher education, freedom to say what I think without fear of reprisal or imprisonment, freedom to walk my dog on a balmy June night with the scent of lilac in the air. As with John Adams' significant thoughts on the matter, I understand the connection between freedom and protection.

"I must study politics and war, that our sons may have liberty to study mathematics and philosophy. Our sons ought to study mathematics and philosophy, geography, natural history and naval architecture, navigation, commerce and agriculture in order to give their children a right to study painting, poetry, music, architecture, statuary, tapestry and porcelain," Adams said in a letter to Abigail Adams dated May 12, 1780.

This is the macro concept of security. On a deeper level, I know I've suppressed my fears of living without taking responsibility for my personal protection. Never facing my fears, I was, however, always aware of living with them. I am a sheep, but I am an aware sheep. That may be a contradiction—you decide—but bear with me.

As Gonzales explained—and this is not the metaphor humans have used for millennia—this is a natural phenomenon. The wolf/sheep diagram goes like this: Envision concentric circles of sheep. The youngest are in the very center of the circle. The oldest are on the outside of the sheep circle, protecting the entire group from the wolves in the night. Eventually, human beings observed that dogs act as protectors for the sheep, vulnerable all, vouchsafing what really amounts to the quite incapable sheep inside the circle against the wolves. Dave Grossman as written on these concepts in great detail in On Sheep, Wolves, and Sheepdogs.

The author overcoming her fear of guns.

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This makes sense to me. It's the beginning of my greater understanding. As I say, I am a sheep. I'm not naïve about it, but I haven't prepared for "the wolf at the door" as an eventuality, either.

Gone Shootin'

The morning came of Training Day 1. Of the course in general, I will tell you this much: It is not as easy as it looks. None of it. It is hot, tiring, mentally and physically demanding, and it's an easy day. We don't have to wear body armor.

We begin with, and constantly reinforce throughout the entire class, weapon safety.

The five safety rules are as follows:

1. Always assume the gun is loaded.
2. Never point the muzzle anywhere in a direction you don't want to shoot.
3. Don't ever place your finger on the trigger until you have made a conscious decision to shoot, with all that entails, and are ready to fire.
4. Manipulate all the firearm safeties (check them and check them again).
5. Know your target and what's beyond it with 100 percent certainty.

In fact, Cliff and Gonzales assure me gun-safety training for children begins with the five safety rules. Gonzales and Cliff, both Texans, started shooting when they were "around four," so basically, before anything else they can remember. Blauer, a Canadian by birth (but we don't hold it against him), took his first shot in his 20s.

Gonzales is not too sure my Magnum is the best choice for me, and who I am I to doubt him? So we start my training off with a Glock 17. The weapon most commonly used by police forces, it was the first pistol designed by the Austrian Gaston Glock, who had no experience with firearms when he designed it in the late '70s (let's hear it for beginners).

Grip Integrity

You've got a strong hand and a weak hand. The strong hand for me is my right hand, which first grips the weapon, and the index finger of which pulls the trigger. The weak hand wraps around the strong hand to support it, but it has to be in a very specific position, with the thumb on the point I can only imagine is called the "thumb point" because it mirrors the index point on the other side. Like "two dogs humping," they all say in nodding agreement. You've gotta love masculine environments. My real problem is that I've been holding a golf club from before I can remember, and I'm not teeing off with this thing, but that grip is hard to unlearn.

We then began basic marksmanship drills, which have a five-step progression:

1. Dry fire, sight alignment.
2. Dry fire, follow-through.
3. Live fire, sight alignment.
4. Live fire, trigger management (Level 1).
5. Live fire, trigger management (Level 2).

Trigger Management

For me this was the hardest aspect to master. "Caressing the trigger" seems at odds with the action required to pull and release it, but once I did get it, it was utterly satisfying. Like the grip, once it's learned, you can't unlearn it. Pull, click, pull some more, release, hear the click but don't go too far, depending, pull again, back and forth for as many times as you want the weapon to fire, plus one. You can screw up and forget it, sure, but you can go back and repeat your success if you focus on technique. The other day I was explaining to my five-year-old how to take a good picture, and to my surprise I found myself explaining to her in exactly the same way: hold it after the picture is taken, as if you're going to take another.

Trigger manipulation requires finesse and practice for best accuracy.

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Dry-fire sight alignment involves the use of a SIRT training tool; it looks a great deal like the Glock, but it focuses you on trigger management. It emits a red laser point on your ostensible target when you make contact with the trigger, then a green one when the trigger is depressed. As Gonzales notes, "The training tool allows me to establish the correct neural pathways for trigger management: trigger prep, the squeeze and the release."

There are three things to focus on immediately: your target, the front sight on the weapon, and the rear sight on the weapon—but with an emphasis on the front sight. They all line up. We practice getting the sights in our aim (well, I practice this). My hands start to shake.

Firearm-manipulation drills are up next. We load bullets into a magazine. If you've got very strong fingers (like you can hold your body weight with no problem on two curled fingers off the edge of a rock face while eating lunch), this is pretty easy. We then insert a fully loaded magazine into the weapon, and release it. You have to set it, not smack it. Obviously they do it harder than they need to in the movies—dramatic effect, and all that. I practice this a lot. Loading, unloading and safety check to make sure the weapon is safely cleared (empty of bullets). It never gets less frightening. Not yet. But I appreciate the major emphasis on safety, which never lets up.

Tyler Northrup

CrossFit affiliate owner Christmas Abbott with her Kimber .45.

The "index point" on the weapon is where your finger should rest at every moment when it's not on the trigger and ready to fire. During fight-or-flight conditions you have a startle reflex with a flinching component, and you could fire the weapon inadvertently, negligently. Keeping your trigger finger on the index point helps mitigate this.

The Fighting Stance

The stance felt weird to me at first, so I must have looked really stupid. It's a combat stance, one that Blauer knows very well, but one I've never experienced or practiced. Leaning quite far forward, with both legs bent, actively engaged, you point the weapon forward as well. Yet at the same time you bring the scapulae together, allowing your skeleton to form a strong, focused stance to take the force of the recoil. This is Blauer's stance; he's been doing this and teaching it to others for decades. He's at home in it. As soon as I figured out I'd done it in yoga practice, it was second nature, but I still had to remind myself of it each time during the drills.

I admit I had to bite my tongue to avoid saying, "Hey, Cliff's not leaning as much as you want me to lean," but Cliff doesn't need to lean like me. This is a guy whose body could more than take the force of the blow, I imagine, even if he was leaning backwards. His stance renders immediately apparent his decades of jiu-jitsu training, and then some.

Going Live

Finally, we get there: live fire.

Our target is an image of a "bad guy," a slightly less than 2 x 3-foot paper stapled to cardboard and hung off a metal rack designed for this purpose. At three yards' distance, with me aligning the sights, in the fighting stance, weapon ready with my finger on the trigger, Gonzales instructs me to fire at the left target; he'll do the final trigger pulling. There is so much to think about and I'm not even in any real danger. But nothing happens. At a certain point, Gonzales says, "Left. Left. Left." And then, "OK, in America, it's the other left."

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I'm aiming at the wrong target, a circle of four-inch diameter to the right of the image of bad guy's head.

> I experience recoil for the first time. It's like a blowback of force, but one that is also astoundingly loud.

Firing my first live round, I experience recoil for the first time. It's like a blowback of force, but one that is also astoundingly loud. If you don't kill your target, you will certainly deafen him. The first time for everything having to do with the body at high speed, however, is always utterly thrilling—imagine a first motorcycle ride—but this is such compression of speed into time that the force of the blow on the body isn't easily described.

Here is where something starts to feel familiar, and CrossFit analogies again come into play. Without having first experienced the recoil, the stance is hard to figure out, mentally. But the whole exercise is like doing overhead squats with a PVC pipe: it doesn't quite feel right until you're doing it with a loaded barbell. I remember what Gonzales said about the snatch, and the fighting stance starts to make sense.

I open my eyes and see to my astonishment that I hit the target; the correct one. I repeat this success with every shot. So much for the fear of not hitting the target frame. I'm knocking them back in swift order. My confidence increases.

But then we switch from shooting the dot on the left to shooting the image of the bad guy in the face, and this was much more difficult for me. It took a great deal, actually, not of courage but of something else, some deliberate shutting off of some part of the mind. But I overcame it. I told myself something I'd learned from CrossFit: you've got to keep going because quitting is not an option. In retrospect, for me this was the hardest moment of the two days. It's one thing shooting at a dot, it's another thing to aim at a human, even an image of one, even one who is, as Blauer wryly pointed out, already "stapled."

Gonzales and I practice drills for the rest of the day, at different distances, the greatest of which is 25 yards. I still manage to hit the target, and not too badly. Blauer and Cliff work on close-contact and step-back drills. As Gonzales explains, "Firing from ultra-close contact can be a bit unsettling and requires some inoculation. It also requires some muscle memory so the firing position is consistent and you are able to put good rounds on board. The drill starts with close-contact shots, then progresses to getting off the 'X' all while continuing to engage the threat." It is very fun to watch Blauer and Cliff, who are clearly expert at this. I can't imagine being closer to this kind of action anytime soon.

During the first day, we discuss various significant issues of owning a weapon. We discuss the theories of John Lott, as outlined in *More Guns, Less Crime*; statistically there is less crime per capita in U.S. states in which more citizens own weapons. One of the more interesting points for me is the concealed handgun license. In some states, it's extremely easy to obtain one, and in others it's much harder, with more restrictions as to who can and cannot hold one, some of which seem rather nebulous. As it happens, I wear my rigger's belt, holster and magazine pouches to lunch—mostly because I'm using it all to hold up my pants—but the looks I get are great. I wasn't concealing anything, right? But the power suggested by the empty holster is an awesome thing to sport for a little while. And my girlfriends were right; there is something very sexy about the power afforded by the weapon. It starts to occur to me that this is, indeed, fun. Fear is slowly slipping away.

The target, the front sight and the rear sight need to be in alignment, and a smooth trigger pull will put the round in the right place.

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Twice it enters my head during the first day that if my left hand is in the wrong place and I fire, I could shoot off a finger. It takes a few moments to recover from the thought. The same thing happens when I imagine shooting off a toe when placing the gun back in its holster. I overthink things, I know. But Gonzales reassures me and says, "You wouldn't really notice that until it was over." I think he means it as a comfort. I vow to try and remember the index point, always.

By the end of the day, I am exhausted. But I am aware of a shift: confidence is slowly replacing the space occupied by fear.

Training Day 2

On the second day we review everything, beginning with dry-fire practice drills. Live-fire drills are next, but this time we emphasize the element of time in the equation. These practice drills aim to bring it all together. After we practice firing live rounds, we move up to diagnostic drills, and then later to timed exercises that really force you to bring together everything into a seamless movement.

The target—if not killed then severely incapacitated.

By shooting with cadence in mind, keeping a metronomic and even shooting rhythm shot after shot, we work up to five rounds in five seconds. This means drawing the weapon from the holster, aligning the sights, prepping the trigger, and taking five even shots, all in five seconds. Nothing to those who've been practicing since they were four years old, it forces the rest of us to put all the movements together. A loaded bar for those overhead squats, as it were. Blauer blows me out of the water.

> I'm not upset at having failed; the thing is … the bad guy is at the very least on the floor and incapacitated while I dial 911.

It occurs to me that actors take classes like this in preparation for their roles. That makes me think there's a certain aspect to this of how you appear doing it. Sure, the stance is better apprehended when you think of the body in space, but if you imagine you're an awesomely cool sharpshooter like Cliff, you almost become one. Note, please, that I said "almost." But there's an aspect to being fierce in fighting off an assailant that has to do with the appearance of confidence. It's an attitude.

Last up: the test. Test? What did I think? Of course there's a test. The bar is set very high here. It's the Level 2 test, and I fail. But in lieu of a certificate, I get a baseball cap and T-shirt that look way cooler on than a certificate would, so I'm pretty happy. And I'm happy with my results, which speak for themselves.

TriCon has extremely high standards. There's no you-did-good passing grade if you haven't, and evidently some attendees are miffed at this. The bottom line is there's getting the job done or not. I'm not upset at having failed; the thing is, and if you look at my final test result you will have to agree, the bad guy is at the very least on the floor and incapacitated while I dial 911. And even though my expectations of myself were set rather low ("Dear God, please let me hit the target") I am rather surprised to see that, damn, I'm pretty good at this!

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My strong hand hurts in ways I hadn't noticed throughout the training. I probably fired about 500 rounds, and that's a lot of absorbed shock. But it's a good hurt, the way it feels when you're smiling and sweaty, lying on the ground, and your hands are bleeding. You know what I mean.

As for my training partners? I hope they enjoyed themselves as much as I did. Blauer is a professional coach and contact athlete. Gonzales notes that training him is "like molding clay," in that he's a dedicated athlete, but with little exposure to firearms.

> "Having an athletic background at first exposure was invaluable, because you have the ability to maintain and sustain a certain stamina throughout the training."
>
> —Jeff Gonzales

"Watching him progress was a pleasure," Gonzales says. "He developed correctly because of his finely tuned motor skills."

Blauer has taken a few shooting classes before this—including the one immortalized in that cool Facebook image—and his years of unarmed training transfer well when he's equipped with a weapon.

"He's got a fighter mentality, combat skills, proper stance," Gonzales explains. "He's an analytical athlete. He knows what he's doing. He may not be able to correct himself yet in real time, but immediately after he knows what he did wrong, which is critical to the process—being self-correcting."

If Blauer was clay due to his incredible physical preparedness, I was a sponge. Thankfully, this didn't refer to my level of fitness but that I hadn't picked up any bad shooting habits along the way, golf grip notwithstanding.

And Cliff? Cliff Byerly, a member of the Marine Corps for over 20 years, 12 of those on active duty with the 1st Reconnaissance Battalion, has taught shooting to the same special-forces people as Gonzales. He's a former police officer with the LAPD, a CrossFit coach, and now he works with Blauer.

In training terms, I am a "blank slate," an appellation I much prefer, by the way, over "sponge." But as a blank slate I am holding onto those preconceived notions, anxieties, myths and fears. There is a saturation point, however; my experience of the course, my progress, and what I'm able to take away from it have limits. I believe I'd have been better able to deal with my initial fears had I done one of Blauer's SPEAR or CrossFit Defense courses first. Personal readiness through fear management would have allowed me to progress faster.

Gonzales tells me professional soldiers deal with fear, as well. One of their biggest fears is letting their teammates down. When he was on active duty, one of his fears was not having enough ammo. Hardcore trigger pullers, evidently, have recurrent dreams of running out of ammo.

I completed the program, though, and even Gonzales acknowledged I was "able to do quite well." The majority of his students are "hardcore trigger pullers," but everyone starts somewhere. Perhaps you have an advantage if you're four years old. But Gonzales finds that those who think they're rock stars when they start his course still have to check their egos at the door. These types don't like the feeling of failure.

"When guns are outlawed, only the government will have guns. The government, and a few outlaws. If that happens, you can count me among the outlaws."

—Edward Abbey

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Preparing for the unknown means training at close range too.

His students who are CrossFitters, however, don't have this problem, as they can overcome the weakness that ego engenders. Given the opportunity, these people will succeed. Gonzales points out something I hadn't noticed before: the Naval Special Warfare insignia is an eagle with its head bowed, signifying humility. He notices this quality in the members of the CrossFit community that he teaches.

"They are willing to check their egos, go out, and better themselves and their results. They get hurt? They go back."

It's part of the mental training that you give yourself through CrossFit training.

Fit and Ready to Fight

I discovered certain things about myself during the course. While it's physically and mentally challenging, I'm actually pretty good at shooting. It's absolutely an art—a lot of things have to come together—but I am more confident, and it is empowering. I still need to work on fear management and would benefit greatly from hand-to-hand combat training, but I now have a better chance of defending myself.

According to Gonzales, "Having an athletic background at first exposure was invaluable, because you have the ability to maintain and sustain a certain stamina throughout the training that allows you to take in more material and retain what you've learned to a greater degree. You'll improve faster and you'll lose less of it over longer periods of time."

However, in order to retain what you learn, the beginner needs to practice to sustain technique proficiency.

"Then you'll see improvement over time. If you don't, you'll see exponential depreciation of proficiency over time," Gonzales explains.

It was also an unexpected pleasure to discover that there is a great deal us sheep can learn from the dogs. So now I practice. This experience reinforced something I already knew: facing fears, the ability to have courage and being prepared all come down to having a great trainer—and to practice. All my life I'd thought that my chance for survival in a dangerous situation was up to the Fates, but now it's not up to chance.

If you've got my child and you're gripping her at the throat, you're gonna go down.

✦

About the Author

E.M. Burton is a ***CrossFit Journal*** *staff writer. She wishes to acknowledge with gratitude the significant contributions to this story of Jeff Gonzales, Tony Blauer, Cliff Byerly, Christmas Abbott and Tyler Northrup.*

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