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The Thin Red Line of Fitness

That moment when your lip starts quivering, your face goes numb and you realize you went out too fast. Emily Beers investigates the pros and cons of “red lining” during a workout.

By Emily Beers

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Kim Bellavance

If you've spent any time at a CrossFit box, you've seen it happen. It might have even happened to you.

Usually, it's painful to watch. Often, it's unnecessary, avoidable. And always, it's self-inflicted. The Fly and Die, the Crash and Burn, the Red Line—all usually look something like this:

“We're doing Tabata push-ups today. Choose a number you think you can maintain for all eight intervals. Be conservative here—it'll sneak up on you,” warns the coach. “Your score is the lowest number you get in any of the eight intervals.”

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Those who have been here before know what's about to happen to their shoulders, pecs and triceps. So they take their coach's advice and choose a conservative push-up number. But there's always one dude who ignores the part about being conservative.

**When all is said and done,
his final Tabata push-up score
is a meager three.**

"Screw it. I can hold 16 push-ups each interval," he thinks to himself with supreme confidence.

The first round goes well for everyone. The experienced athletes only use half of the 20-second interval, while the

CrossFit rookie, who has spent his life benching, throws down 16 push-ups. Feeling jacked up and vascular, he's sure he's en route to an impressive score.

Round 2 looks similar. Everyone holds his or her numbers. Then Round 3 hits and the rookie's confidence takes a small hit. He needs a quick break after the first eight push-ups, and he ends the round with 12. He alters his game plan, still believing he'll be able to finish with a score of 12.

"Easy, big fella. Back off a bit," the coach says to the ambitious new athlete.

That's when things really start to unravel. Round 4 is even tougher, and in Round 6 it's nearly impossible to hold six push-ups. Round 7 drops him to five push-ups, though he musters up two or three valiant attempts at a sixth, squirming aggressively to lock out his elbows, only to give up and dramatically plop flat on his chest. When all is said and done, his final Tabata push-up score is a meager three.

Fly-and-die fail?



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Total exhaustion hits like a ton of bricks. No amount of heart or grit will get you past pure muscle failure.



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When the clock starts, it's hard to resist the temptation to burst out of the gate at top speed.

The Pace of Life

Many athletes, especially inexperienced CrossFit athletes, have no idea what their physical abilities really are. In turn, they have no idea how to pace themselves during a CrossFit workout.

Although most people would have the sense to avoid running the first 400 meters of a five-kilometer run at the same pace they'd run an all-out 400-meter sprint, when it comes to new and usually unknown CrossFit workouts, they often want to "sprint" in every single one.

The experienced CrossFit athlete, on the other hand, knows going out too hard means the workout will be much more painful than it needs to be. And generally his overall performance will be slower, as well, as he has learned that "red lining" early doesn't often lead to maximized performance results. More efficient pacing usually makes for a more efficient workout.

Learning how to pace isn't just a fitness phenomenon. A February 2013 article in the *Journal of Consumer Research*

For an elite CrossFit Games athlete, Fran is indeed a red-line affair in which athletes will literally run between movements to shave time.

suggests that life itself is more enjoyable and fulfilling when you pace it properly.

From work to sleep to decisions about what we consume, we have all learned—sometimes the hard way—that too much of a good thing can be, well, too much.

The article, [Slow Down! Insensitivity to Rate of Consumption Leads to Avoidable Satiation](#) argues that it is best to pace ourselves when it comes to consumption.

“The consequences of overly fast consumption can be seen all around us. The music lover sets a favorite album on ‘repeat’ only to find it less and less enjoyable each time it plays. The chocolate aficionado eats one too many chocolates and discovers that the richness of the cocoa begins to lose some of its appeal. Perhaps even the inseparable lovers who insist on sharing every moment may wonder later whether a little absence might have made their hearts grow fonder,” wrote the authors of the article.

From a workout perspective, Fran, too, can be more enjoyable for the new CrossFit athlete if he doesn’t senselessly red-line himself into a brick wall by doing 21 unbroken speed thrusters at a two-minute-Fran pace, all the while forgetting to breathe, getting his heart rate up to 180 beats per minute and temporarily going deaf in one ear.

When this same athlete reaches the round of 15s, his pace slows right down; he rests for a full 30 seconds, squirming

uncomfortably because he’s worried about his quivering lip and concerned he might pass out. Another minute goes by and he can’t string together more than two thrusters without putting the bar down, while his pull-ups are a similar story.

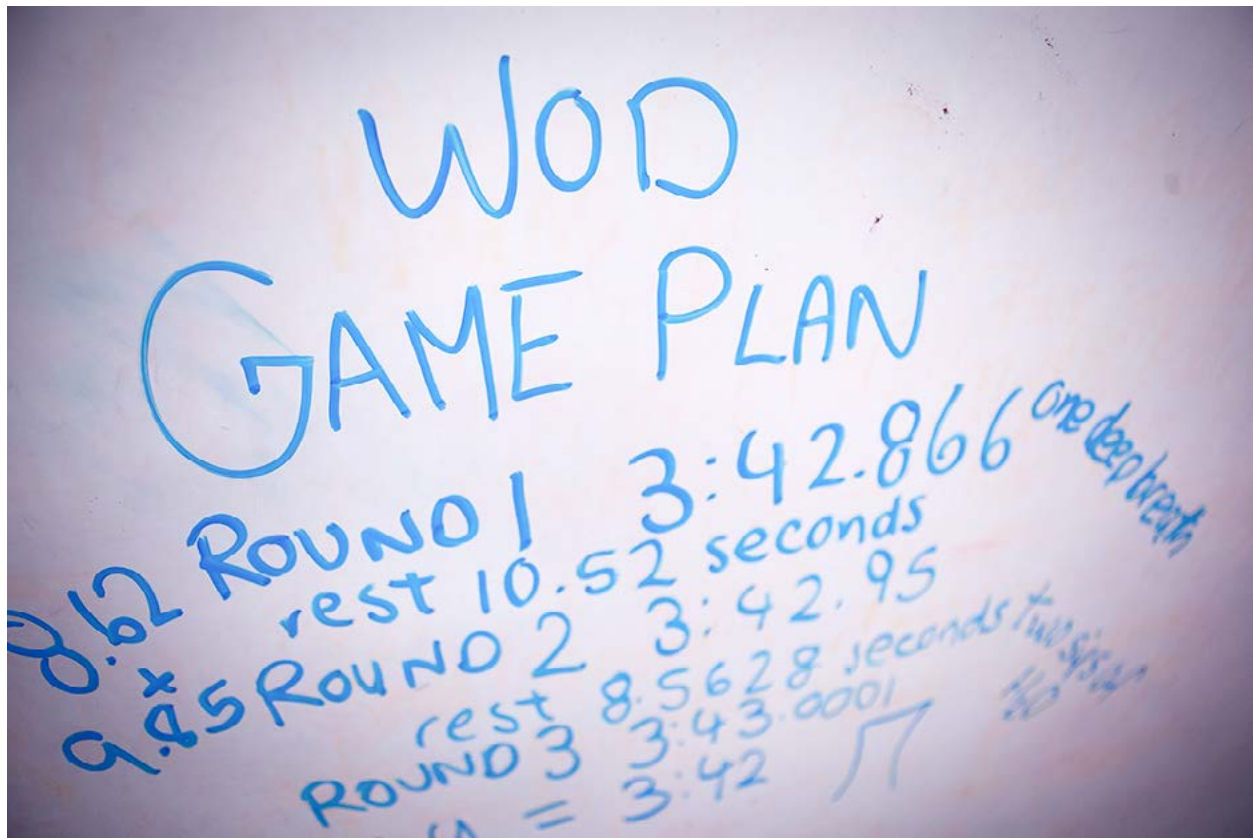
This kind of effort usually ends in disaster. While he might salvage a 7:30 Fran time, he realizes full well that a slower pace off the top could have produced a sub-five Fran—and he wouldn’t feel so horrible. Instead, he’s slumped over the toilet, weakened, lifeless, hopelessly defeated by nausea and burning Fran lungs.

For an elite Games athlete, Fran is indeed a red-line affair in which athletes will literally run between movements to shave time. No pacing is required when you can sustain your maximum intensity for two minutes and 90 reps. But CrossFit is about getting the most work done in the shortest amount of time, and for many athletes, that means finding the right pace and the ideal balance between work and rest.



Kim Bellavance

Experienced CrossFit athletes learn to focus on their pacing more than the clock.



Kim Bellavance

Some CrossFit athletes might want to go so far as to plan out their pacing strategies so they don't turn their brains off as soon as the workout starts.

The Body at "Red Line"

Tony Leyland is a professor in the Department of Biomedical Physiology and Kinesiology at Simon Fraser University in British Columbia. He's also a long-time CrossFit athlete.

Leyland explained that what happens in your body when you "red line" depends on the kind of workout you're doing; however, in every case, maxing out takes its toll on your central nervous system.

"If it's an endurance workout like Murph, and you really blow yourself out, what you have done is deplete your glycogen as well as build up a lot of acidity in your muscles," Leyland said. "It ends up being really hard on your central nervous system. And it will take your body multiple days to completely recover from Murph."

He explained: "(Performing) a one-rep-max clean and jerk means you've blown out your central nervous system, and you probably won't be able to do another max effort that day, but it's faster to recover from a one-rep-max clean and jerk than it is from blowing yourself out on Murph."

That said, even maxing out a deadlift can look like a "fran red line," ultimately screwing you up more than you might expect.

"I remember judging someone at the B.C. Sectional competition in 2010, and it took him 10 seconds to lift a max deadlift. He took so long that I actually had time to think to myself, 'He's going to get it. No he's not. Yes he is.' It took so much effort, and at the end of the lift, he was basically screwed for the rest of the competition that day," Leyland said. "His central nervous system was shot."

A Time to Red Line?

Despite the consequences to your central nervous system, there can be psychological and physiological benefits to letting athletes red line from time to time, as crashing and burning are essential parts of learning your limits and pushing past them.

Jesse Ward, owner of Lynwood CrossFit/Local's Gym in Lynwood, Wash., and a member of CrossFit's Level 1 Seminar Staff, believes there's a time to red line.

Although he understands the importance of teaching athletes how to pace themselves, he thinks sometimes people need to learn it on their own, and occasionally it's good to let your athletes hit walls during workouts, especially new athletes.

"Newer athletes just don't think about (pacing) or don't think it's a good idea to pace," he said.

Although Ward knows pacing properly is better for performance results, sometimes gains can be made by pushing past an athlete's limits.

"Sometimes crashing and burning might produce superior results, as long as the movement pattern doesn't completely degrade," Ward said.

He added: "I think the thing with newer athletes is to convince them that they can move great even when tired. Getting that concept nailed down and ingrained is what it takes. And I think that feels like pacing when in reality it's just moving as fast as you can as best as you can. ... And

that 'pace' is usually a bit slower than people think they should go in a timed workout.

"For some people, they have to feel it get all the way bad ... and then they'll understand what you're talking about."

—Jesse Ward

"If someone is just dying to hit 100 wall-ball (shots) with that 20-lb. ball so they can be legit and wish to forego any wisdom, planning or omen from the sky, I usually say that



Ward thinks finding that red line is an important experience for new CrossFit athletes.

it takes about a minute to do 25 to 30 shots, and that it should really only take them four minutes to get this done. Usually, saying that with a highly sardonic sneer gets the conversation started about how to scale or pace."

But even that doesn't necessarily cure the inexperienced eager beaver who overestimates his or her fitness level.

"For some people, they have to feel it get all the way bad and get a time, and then try it your way once and get a better time, and then they'll understand what you're talking about," Ward said.

Physiologically speaking, Leyland agrees there are appropriate times to "red line."

If you're an Olympic lifter and all you have to do is snatch and clean and jerk, then competition day is time to "red line." But when you're competing in CrossFit and you have



Brian Sullivan

CrossFit Games athletes like Tyson Takasaki strive to push their limits further so they can work longer and faster before burning out.

more events to hit later in the day, it's best to leave some effort in the tank.

"After truly pushing myself to the max in many CrossFit workouts, there's no way I can come back for quite a few days," Leyland said.

And the more you push your central nervous system, and the more micro tears and temporary damage you do to your muscles and joints, the longer you take to recover. That said, training is a different story; training for a CrossFit athlete is the time to truly test limits, Leyland explained.

"By making any system fail, the body will attempt to rebuild stronger," Leyland said.

"It's a bit like a pyramid of training, with technical work and sub-maximal efforts at the base of the pyramid, and higher intensity work and maximal efforts at the peak. You just don't need to try to hit a PR very often."

On top of potential physiological gains, Leyland said the largest gain from red lining might be psychological.

"Going to your max can give you some mental strength when the going gets rough. When you get back to that place, you'll know you have been there, and you'll know you can do it," Leyland said.

Coaching New Athletes to Pace

Let's take a movement like a wall-ball shot.

Ward's approach: "As a coach, when working with someone new to do 100 wall-balls for time, my great preference would be to have them work some intervals prior to the workout (like weeks before) to understand the stimulus, pacing and breathing and all that. Doing sets of eight to 15 with short rests built in is great practice," he said.

Then when it's time to do 100, Ward will scale them right down.

"I like to get people I know can do 100 wall-ball shots to try and do them in a row with a 6-to-8-lb. ball. This is totally doable. It just burns, and it gets them to understand that it's OK (to feel that burn) and that they should keep going," said Ward, who admits that teaching people to pace themselves is one of the greatest challenges of coaching.

Tyson Takasaki, an individual competitor at this year's Games and a trainer at CrossFit 204, agrees with Ward.

"I find that athletes that enter our facility with a higher athletic background have a harder time pacing workouts

because they have already been previously exposed to some sort of intensity training," he said. "Newer athletes in general tend to take workouts more cautiously than others."

Takasaki added: "When a workout is programmed, I try to give them a focus as to how to attack it ... The best advice I give my athletes is one I give myself: 'Know your body and your strengths and weaknesses.'"

Like Ward, Takasaki believes sometimes it's best to let new athletes figure it out for themselves.

"I think there is some value in letting them reach that failure, whether it's muscle fatigue or just general decrease in performance or power output because they went too fast," he said.

Nate Beveridge, a CrossFit Games athlete who competed at the CrossFit Games in 2012 and 2013 with his CrossFit Fraser Valley team, has a similar philosophy.

"If you don't push to failure, then you will never learn where your limit actually is," he said. "When you push beyond where you think the edge is, you might be surprised at how far you can go."

**"If you don't push to failure,
then you will never learn where
your limit actually is."**

—Nate Beveridge



Thomas Campitelli

Nate Beveridge says managing pacing on a team is a challenge because you're dealing with varying fitness levels.

But generally, especially when it comes to competition, you want to stop them before they overdose.

"I try to coach my athletes to stop just short of the red line. You always want to leave another rep in the tank so you can get a decent chunk on your next set," Beveridge added.

And then there's the other side of the fence.

Beveridge has noticed that for every athlete he has to try to hold back and save from overdosing, there is an athlete who is scared of the pain cave, who refuses to push even close to the red line.

"Almost as often, newbies are guilty of pacing too much and leaving a lot more in the tank," he said.

As a coach, it becomes a balancing act.

"Coaches can definitely help by going over tips and cues for pacing before the workout, and if you are nearby you can read your athlete and provide instant feedback to

encourage them to push harder or to tell them to rest when needed," he said.

"Oftentimes, new athletes stress themselves out emotionally. They get so tight and elevate their heart rates simply through nervousness. As coaches, we can help them overcome this by hammering technique and teaching them to stay calm and focused, and then we can really help them to perform their best," Beveridge said.

Competition Pace

Many experienced CrossFit athletes know all about how to pace themselves perfectly in competition.

They know exactly how much rest they need between muscle-ups to avoid failing a rep; they know exactly how fast they should row 1,000 meters during Jackie, which will allow them to maximize their thruster and pull-up efforts and ultimately get the work done in the least time. They know that failing a muscle-up or going out too hard on the row will ultimately mean a worse performance in the end.



August Sigurjonsson

Jason Khalipa showed masterful pacing during the Row 1 and Row 2 events at the CrossFit Games in 2013. He avoided burnout while winning the 2K row and then maintained his lead for another 19,097 meters to take first in both parts of the event.

Takasaki believes competition is all about pacing.

"I think it's all about knowing your body," said Takasaki, who added that this is especially true in competition when you're hit with workouts you've never seen before.

"I find that a lot of CrossFit athletes that have been around for a number of years have so much success not because they are more fit but because of the amount of time they have spent training under different kinds of stimuli," he explained.

Ultimately, this allows them to train and compete smarter.

Takasaki has incorporated a ton of interval work into his training—workouts with specific work-to-rest ratios. He said doing so has helped him discover his true capacity. And once he discovers where his capacity is for any given movement or workout, it helps him figure out when he has to back down.

Similarly, Beveridge spends a lot of time thinking about pacing. He rarely goes into a workout blindly.

"I try to look at workouts as pieces first. Is there a movement I'm particularly efficient at that could be a possible 'rest' period? Is there a movement that is particularly difficult or heavy, which will cause me to take breaks and catch my breath? I formulate a pace based on these factors and the length or the workout and rep scheme, and I try to come up with a pace that I feel I can sustain for the duration," Beveridge explained. "Then I try to go just a little quicker than that and hold on until the end."

Competing with a team, of course, changes how Beveridge approaches a workout. When you're with a team, you have to be aware of your own abilities as well as those of your teammates.

"When you're working with others and you know there's going to be a built-in rest period, sometimes it's OK to push a little further down that path if you trust your teammates to do the same, which will give you adequate time to recover for your next set," Beveridge explained.

The CrossFit Games Open workouts are a good time to learn about how to pace yourself, he added, especially because as an athlete you have a lot of time to think and scheme about how to approach each one.

During the Open in 2013, Beveridge would look at the workout and then test one round, or a piece of a round, before attempting the full workout. This would tell him how fast he could complete one round, and then he'd



One possible side effect of hitting the red line at the wrong time.

have to figure out if that pace was sustainable or not. From there, he'd decide on his game-day pace.

Sometimes, though, considering all the variables and overthinking things can drive any athlete nuts. This is why sometimes Beveridge chooses to turn his brain off and listen to teammate Mark Cassibo's advice:

"Sometimes, you just gotta go."



About the Author

Emily Beers is a CrossFit Journal staff writer.