the CrossFit JOURNAL ARTICLES

Evidence-Based Fitness

Rest Day Discussion

Greg Glassman, et al.

CrossFit.com runs on a three-on/one-off rotation: perform the posted Workout of the Day (WOD) for three days; debate and discuss on the fourth ("Rest Day"). The topic of discussion for Rest Day on December 10, 2006 was a charge leveled by Mike Boyle ("Body By Boyle") at a Special Operations Medical Association Conference that CrossFit's use of "high-rep Olympic weightlifting" renders it "dangerous."

The ensuing discussion among Greg Glassman ("Coach"), "René," "BOA," and Michael Boyle, excerpted below, goes to the heart of the debate over safety, efficacy, and efficiency in fitness programming and the need for an objective basis for evaluating competing fitness claims.

Post by "René"

Having read several articles by Mike Boyle, it is clear his number one priority is to not have the athletes he trains get injured during training. "High rep Olympic lifting" is shorthand for saying "doing Olympic lifts with bad form while fatigued" because form tends to break down when fatigue catches up or accumulates during high rep sets. You can see examples of this from breakdown in the various Grace, Nasty Girls, Elizabeth videos that have been posted at CrossFit. (Which is not to take anything away from the athletes in those videos, don't get me wrong.) During the hard work of "for time", form can be compromised. One can make the assumption that injury is more likely with bad form than with good, which is reasonable to some degree for the Olympic lifts. (A question is: to what degree?)

What is the goal of doing Olympic lifts for high reps? Do the weaknesses that are attempting to be addressed with the high reps necessarily need to be addressed using Olympic lifts? Could a "safer" movement be used instead (which presumes that one has accepted that Olympic lifts are "less safe" than some other lifts; I presume Boyle has decided this to be true)? Or could the components be trained separately (strength-endurance vs. metcon, perhaps)?

If so, and if your goal is to avoid higher chances of injury, and if you believe that Olympic lifts with bad form are more likely to cause injury (perhaps because it's so easy to have bad form on the lifts), then, yes, you likely would think that high rep Olympic lifts are better to be avoided.

Use Olympic lifts to train explosiveness, flexibility, and strength, and use something else to drive the trainee hard during high rep weight sets, where proper form is less necessary for a safe lift or where proper form is easier to maintain while fatigued or under hard metcon duress.

Is it true that ANY exercise performed for high reps will lead to form break down? Maybe, but the idea would be that the Olympic lifts, which are quite complex, are more likely to break down before "easier" lifts would.

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Post by "René" continued

As an example of his point of view, he no longer has his trainees do back squats. He has replaced them with front squats because you can get some of the same benefits without the extra loading of the back and without the higher chance of loading the back in a compromised position. (In the front squat, you lose the weight forward if your back gets too far forward or bends, whereas in the back squat the weight keeps bending you even more. So the front squat is "safer".) He also has recommended replacing the conventional deadlift with single leg versions, which gives a similar hit to each leg while the back only sees half the weight. (You can read an article of his stating this on t-nation.)

I would imagine he knows that there are compromises with training this way but believes that the fewer injuries or possibilities for injuries is worth it.

So if Coach prescribes high rep Oly lifts, he clearly believes that some/several/all of these assumptions are pure bunkum. Either that, or the benefits to be gained far outweigh the chances of injury. I know the CrossFit dictum is that "form comes first", but it is clear that in the pursuit of intensity, form does break down and is "allowed" to. For example, the athletes in those videos are not told to stop during the workouts by the CrossFit trainers. How much is too much? Is it that the athletes know themselves enough when to stop or when the weight is too much and can cause injury?

For punters such as myself doing this by myself at home, I have to approach these things with caution and try to figure it out without the benefit of experience or as much knowledge as I would like.

Comment #27
Posted by: René at December 9, 2006 09:18 PM

Post by Greg Glassman

If safety is your sole or even your primary concern, your athletes' fitness potential will be soundly blunted. Where fitness is your sole concern, safety must be given reasonable priority. Safety, efficacy, and efficiency are clearly, mathematically, interdependent. It would be foolish to think otherwise.

Olympic lifts "Highly technical"? Rubbish. Only compared to the rest of weight training. There are thousands of gymnastics movements fantastically more technical than the clean and jerk and the snatch. In any case, CrossFit, with high rep weightlifting, has been shown in clinical and institutional settings to be dramatically safer than the traditional run, sit-up, pull-up, jumping jack, push-up, lather, rinse, repeat, PT. This is not due to the "highly technical" nature of jumping jacks and running.

Not practicing complex movements fatigued? More rubbish. Only by practicing them fatigued will we advance the point where fatigue adversely affects form. Learning to race cars at high speed increases the likelihood of crashing. It is not the crashing that improves the driver's skill, however, but transiently increasing the likelihood of crashing is an essential part of decreasing the likelihood of crashing at any given speed.

Not all form faults are dangerous. Most clearly are not. Most increase the metabolic costs of an exercise or workout, i.e. reduce efficiency, and are not only acceptable but beneficial to conditioning. But what is certain is that only by working to exhaustion, where form faults are ineluctable, will we push the margins of power output where form falters. We push to the point of exhaustion and form breakdown to 1) increase/ improve the safety of high output max efforts, and 2) maximize work capacity. How simple is that?

Show me a program where form is controlled to the point of never failing and I'll show you an athlete who a) will fall apart at output levels where CrossFitters are untaxed and moving with grace, and b) cannot match the work capacity of CrossFitters.

The ideal state for learning new activities is certainly when the athlete is fresh. This should not be confused with advancing the horizon line where form is maintainable under duress.

Mr. Boyle was able to quantify his concerns for the dangers of high rep weightlifting - anything approaching twelve reps. As reported to me, this wasn't load qualified, but rep qualified.

If taking your one 1RM for the C&J and attempting 20 reps is an example of dangerous high rep weightlifting then it's dangerous like trying to jump up and touch

Post by Greg Glassman continued

the sun, and I haven't met anyone stupid enough to try or even think it possible. Calling 100 clean and jerks with a twenty pound medicine ball for time dangerous makes even less sense, and this effort qualifies by Mr. Boyle's statement. It is also consistent with CrossFit programming. (Hmmm?)

At the SOCOM Conference Mr. Twight (Yes, Mark) appeared with his arm in a sling due to a recent surgical repair of a climbing injury. To great derision and laughter, his condition was attributed to high rep weightlifting. That cheap shot holds the crux of Mr. Boyle's logic and reveals what really motivated his and other presenters' gripes about CrossFit - we're eating their lunch in the marketplace of ideas.

Sadly this has nothing to do with safety, efficacy, and efficiency and everything to do with falling in a very distant second place, or more likely even further, in the quest for improving human performance. Mr. Boyle's problem with CrossFit is that his program got left behind. Think tipped over rice bowls, not dangerous lifts.

Where CrossFit has been analyzed, injuries have been recorded, the analysis has had to bear the investigators' names, and the results made public, CrossFit has been shown to be safer than traditional PT.

The assemblage of presenters at the SOCOM conference is like a conference on retailing where Penny's, Sears, and K-Mart are presenting on WalMart. You bet they think it's dangerous.

We'll hear every bit of noise imaginable from Mr. Boyle, but here's what you'll not ever see: Him posting his athletes' work capacity across broad time and modal domains like we do here three days out of four. That would truly be dangerous.

Comment #41
Posted by: Coach at December 10, 2006 01:54 AM

Post by "BOA"

In the spirit of balanced discussion, I think an invitation to Mike Boyle to join this discussion would be appropriate.

Rest day discussions are usually interesting and the quality of the information presented on this site is always fairly high, but issues are rarely presented in a balanced fashion.

Coach, I love this site and do the WOD faithfully, but your call for evidence/data from your critics is holding them to a higher standard than you hold yourself to. While your ideas are well-conceived extrapolations and postulates derived from medium - to high - quality data, calling them evidence based is a bit of a stretch. You've done an admirable job of designing and disseminating a unique approach to fitness training. The next step to true innovation is to facilitate and participate in a systematic examination of the efficacy of your approach and the presentation of this examination in a form that can be independently validated.

Comment #137
Posted by BOA on December 11, 2006 06:16 AM

Post by Greg Glassman

BOA #137,You've missed something critical. Ironically, we've met and continue to meet daily your stated requirement of facilitating and participating in a systematic examination of the efficacy of our approach and to present this examination in a form that can be independently validated, and the irony is compounded by the amazing fact that you've participated first hand and personally in this examination. You may have missed the forest for the trees. (What bedevils us and you, I believe, is that CrossFit is alone in the game.)

The call for evidenced based fitness is not a call for exercise programs based as are math, physics, and chemistry (biology to a much lesser extent) on first principles and then built upward. Why? It's NOT possible. Not yet.

We're not calling for "peer reviewed literature" supporting ours or any other program because the published exercise science is almost entirely irrelevant to successful exercise prescription. That may someday

Post by Greg Glassman continued

change. I'm hopeful.

Our methods are empirical and fully transparent; they're posted here daily and have been for years as workouts, slide-shows, still photos, videos, and essays.

Our prescription has been repeated constantly at the risk of annoying: "constantly varied functional movement executed at high intensity."

The sought after fitness that guides, motivates, and defines our intent was answered in a free document entitled "What is Fitness?" that tens of thousands have downloaded and presumably read.

We've boiled that eleven page document down to a simple, measurable concept of "increasing work capacity across broad time and modal domains."

In application CrossFit looks like sport – "The Sport of Fitness" – revealing even the motivational methods we've employed.

The methods and results of our program have been duplicated around the globe and by thousands. The point is not that we have fans but that the program is knowable and capable of duplication.

And when I speak of evidence here is what I mean: When an athlete like Greg Amundson posts a Fran time of 2:48 at a body weight of 205 we can, with simple calculations, universally known and accepted by science, calculate that he has performed 54,225 ft-lbs of work in 168 seconds and that this is holding just less than 2/3 of a horsepower for almost 3 minutes.

We can mine data like this for any athlete posting times here in "comments". We can observe that the highest work capacities posted on these pages are trained, i.e., developed from the WOD and that to date no non CrossFitter has come close to these outputs by other methods. We can also readily observe that high work capacity across only a couple of workouts correlates strongly to capacity across nearly all workouts.

But, here's what I'm offered in looking for data to examine the efficacy of a commercial competitor making disparaging claims about our program: "We've coached hundreds of athletes from NHL, NBA, NFL, MLB, MLS, WBA, MLL, NCAA and thousands of High School athletes" - credentials, by the way, that we hold as well, and quite likely, in larger number. Behind a link entitled "proven system" I find neither proof nor system. Comparing CrossFit to this system has been rendered impossible. In much the way that the charge of our being dangerous has been leveled so as to be meaningless yet effective. It's marketing.

Until human performance data is made available the comparison of CrossFit to other programs is a debate not worth having and a colossal distraction to the pursuit of advancing the art and science of improving human performance.

I want to see fitness programming move away from worthless testimonials, incessant back biting, and endless marketing hype and move into the arena of offering measurable, observable, repeatable evidence of efficacy, efficiency, and safety.

Other approaches—ones that modify or entirely avoid our "functionality, intensity, and variance" charter—could adopt standards for fitness that radically depart from our chosen "increased work capacity across broad time and modal domains" and we could still make viable, interesting, and meaningful comparisons, but the defining standards need to be testable by CrossFitters and CrossFitting athletes and the other program's athletes would have to be willing to be tested by the measures we value. Some of that has already happened. (That is how we allied with Coach Mike Burgener, incidentally.)

This is evidence-based fitness.

Comment #151
Posted by: Coach at December 12, 2006 08:10 AM

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Post by Michael Boyle

People have asked me to speak so I will. To address a few points

1- It amazes me how people can turn idealogy person. I don't feel I have a big ego and don't consider myself a capitalist. I paid my own way to the SOMA Conference to sit on a panel and provide an opinion. I did that and fully expected to be asked the "CrossFit" question. I gave my opinion. I don't like high rep olympic lifting and particularly dislike it for those who are not good at it. There are better ways to work hard and develop muscle endurance.

2- I sat next to Mark Twight. I had a good conversation with him and exchanged emails. I don't believe any comments were directed at Mark. Hopefully if he reads this board he can address this himself.

3- My athletes regularly use olympic lifts. We hang clean, snatch and dumbell snatch. I have written articles on teaching olympic lifts and have produced a video on the same. We rarely do more than 5 reps. I use olympic lifts for power and other methods for endurance.

4-I train kids and adults as well as professional athletes. I have no interest in making money off the military and have no issue with the people at CrossFit.

That being said, I stand by original comments.

Thanks
Michael

Comment #152

Posted by: Michael Boyle at December 12, 2006 08:50 AM

I want to see fitness programming move into the arena of offering measurable, observable, repeatable evidence of efficacy, efficiency, and safety. -Greg Glassman

Greg Glassman is the Founder of CrossFit, Inc. and Crossfit Santa Cruz and is the publisher of the CrossFit Journal. He is a former competitive gymnast and has been a fitness trainer and conditioning coach since the early 1980s.