THE
CrossFit JOURNAL

May 2013

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

THE CrossFit JOURNAL

Coaching the Low Catch

Pull it higher or pull yourself under? Bob Takano explains how to get under heavy bars fast.

By Bob Takano May 2013

Staff/CrossFit Journal

There are two components involved in getting a bar overhead or up to the shoulders from the ground.

The most commonly conceptualized component is to lift the weight up to the required height. The second is to lower the body under the bar. In the sport of weightlifting, both components are combined simultaneously by proficient practitioners. Many aspiring trainees, however, understand only the first and can't seem to quite conceptualize the second—or combine the two. For these lifters the default is always to lift the bar higher.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

The task, therefore, is to coach the second aspect and provide training that will combine the two. Whether the lift is a snatch, a clean or a jerk, lifting the weight and dropping under the weight are combined. In this article, I'll focus on the snatch and clean as it seems that fewer people have trouble learning the jerk.

Before I get into the specifics, I need to lay out a few things about technical training exercises. They are primarily used during the technique-learning phase for two purposes:

1. They are helpful for learning positions and motor patterns.
2. They can strengthen specific areas of the anatomy that are imbalanced for lifting weights.

Once technique is mastered and the lifter is balanced, the technical exercises probably won't be employed again unless a lifter is recovering from injury. Some athletes like a particular exercise, and it becomes a "pet exercise." They then spend an inordinate amount of time and effort developing tremendous strength in the specific movement. While this isn't bad, it does siphon off time and energy that could be put to better use in training.

In the process of learning technique, high repetitions per set are counterproductive. Each repetition should be attempted with the intent of perfect performance. Fatigue and lack of proper mental preparation will inhibit proper performance. If the move is explosive, it should be practiced at the beginning of the session when the athlete is fresh.

The Snatch: Finding Home

Before you can teach athletes how to get to a certain place, you need to teach them what it feels like to be there and—if possible—to get comfortable with the position. Many athletes do not go into a bottom position because it is not familiar or comfortable. The following exercises will teach the feeling of the bottom position for the snatch.

The Snatch-Grip Squat Press

This exercise has mistakenly been dubbed the Sots press. The Sots press was actually a pet exercise of Viktor Sots, the 1981 100-kg world champion who employed the power jerk rather than the split jerk in competition. He credited his proficiency in the power jerk to a unique exercise in which he would press the weight overhead from in front of the neck while sitting in a front squat. He claimed a personal best of 160 kg in this exercise, which later came to be called the Sots press by people other than Sots.

To perform the snatch-grip squat press, one must have sufficient range of motion in the ankles, hamstrings and shoulders as well as sufficient strength in the lower and mid back to maintain an erect posture of the torso. I've seen very strong men who were unable to use a 20 kg bar for this exercise due to shortened range of motion.

The lifter begins the movement by supporting the bar on the shoulders behind the neck, taking a snatch-width grip, then descending into a full squat with a flat-footed stance. The movement is to press the bar to arms' length overhead before lowering to the shoulders and repeating. This should reinforce the bottom position and allow for opportunities to develop balance in this position.

The Overhead Squat

In this movement, the bar is taken from a rack while being supported on the shoulders behind the neck. The grip is at snatch width. The lifter steps away from the rack and places the feet in a comfortable squatting stance. The weight is then push-pressed overhead, and from this position the lifter proceeds to squat all the way down and then rises to full stance.

Staff/CrossFit Journal

Both the snatch-grip squat press and the overhead squat are excellent exercises to develop the strength and flexibility needed for the bottom position of the snatch.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Staff/CrossFit Journal

In a pressing snatch balance (above), the feet do not move as the lifter presses down under the bar. In a heaving snatch balance (Page 4) or snatch balance, the feet move from the pulling to the squatting position as the lifter drops under the bar.

Getting Comfortable With the Descent

Pressing Snatch Balance

In this exercise, the lifter begins by taking the bar from a rack, supporting it on the shoulders behind the neck and assuming a snatch-width grip. The lifter steps away from the rack, places the feet in a squatting stance and is ready to commence. The movement proceeds with the lifter pressing the weight overhead while simultaneously descending into a full squat. This is a slow movement and one designed to accustom the lifter to lowering the body under the bar.

Heaving Snatch Balance

The next exercise in this progression begins in the same position as the previous one except that the feet are placed at pulling width. For this exercise, the lifter descends slightly by bending the knees as if to jerk the bar and applies sufficient drive to get the bar moving. He or she then drops under to the overhead-squat bottom position while simultaneously moving the feet to a squatting stance. This requires a speedier descent than the pressing snatch balance: it's a little more dynamic and a little less controlled.

Snatch Balance

The final exercise in this progressive sequence begins in the same position as the previous one. The movement requires the lifter to suddenly drop out from under the bar, simultaneously move the feet out to a squatting stance and catch the bar at arms' length in an overhead-squat bottom position. This is the most dynamic of the three and most accurately mimics the rapid descent into the bottom position.

Learn to Pull and Drop Under

As the athlete masters the descent into the bottom position, the exercises from the previous group can be minimized or eliminated from the training program and replaced by the exercises in this group, which focus on the transition from the pull to the drop and catch. At an intermediary point, the trainee may be using snatch balances as warm-ups before using one of the following exercises.

Staff/CrossFit Journal

As the athlete becomes more comfortable with dropping under the load, snatch-balance drills can be replaced by pulls from the toes or blocks.

Staff/CrossFit Journal

Blocks set to place the bar at the power position allow an athlete to emphasize the second and third pulls in a snatch or clean.

Snatch on Toes

In this movement, the lifter takes a snatch-width grip on the bar, which is resting on the platform. The lifter then deadlifts the bar so that it is hanging down at arms' length. The lifter then performs and holds a heel raise. This is the starting position. From this point, the lifter can only elevate the bar by shrugging and arm pulling. Most will not be able to lift much weight this way.

The movement commences with the lifter upright rowing the bar and then suddenly descending rapidly, moving the feet to a squatting stance and pushing the body down while pressing up against the bar. This exercise cannot be done with very heavy weights.

Snatch on High Blocks

This requires blocks that are adjustable in height. The blocks should be adjusted so that the bar is at the power position for the lifter. The acceleration of the bar should be generated by the extension of the legs and hips, followed immediately by a shrug and arm pull. Immediately upon full extension, the lifter should drop rapidly into the low squat while moving the feet into the squatting stance.

Snatch

When the lifter is proficient and comfortable with the previous two exercises and executes them precisely, it is time to focus efforts on the full movement. The best way

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Staff/CrossFit Journal

After extension in the clean, the athlete pulls under the bar with aggression. The proper receiving position finds the bar resting on the shoulders with the elbows as high as possible.

to practice technique is to perform many singles, with sufficient rest and proper mental preparation before each one. Having a knowledgeable coach available is also highly desirable. The weight on the bar should require sufficient effort, and it should not be so light that it turns the exercise into a pantomime.

On to the Clean!

Attaining a low position in the clean is usually a little less daunting because it appears that catching a weight on the shoulders is not as perilous as catching the weight overhead. Furthermore, once the squat snatch is mastered, the conceptualization of lowering the body to catch a weight is more soundly ingrained into the athlete's psyche, and learning the descent into the clean is more easily achieved.

The Clean: Finding Home

This is basically the front-squat bottom position. Most of the difficulty in performing a front squat is found with athletes who are longtime bench pressers and find it comfortable to support the weight by keeping the wrists straight and the shoulders pulled back. The bar is then resting on the upper chest rather than on the deltoids. Once the athlete conceptualizes the proper supporting of the bar on the shoulders with the hands and arms serving merely as brackets that keep the bar from rolling forward, the proper front squat can be practiced.

Some adjustment of the grip and coaching of the proper support position by a knowledgeable coach should expedite matters. An appropriate range of motion at the ankles and stretchable hamstrings will also facilitate the achievement of a solid bottom or receiving position.

Enough front squatting needs to be done so that the athlete becomes comfortable sitting "in the hole" with relatively heavy weights. If the weights are not sufficiently heavy, the wrists will not bend back sufficiently to achieve the desired rack position.

Learn to Pull and Drop Under

Clean on Toes

With the exception of the grip width, this exercise starts from the same position as the snatch on toes. The weight employed should be heavy enough that it cannot be pulled very much higher than the catch position in the bottom. One of the aims of the athlete should be to catch the weight at the height to which it is pulled and not let it crash down on the shoulders.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Clean From High Blocks

The bar should be placed so that the lifter can grip the bar and maintain a power position with the center of pressure on the balls of the feet. In this variation, the hips, knees and ankles extend, and very slightly later the shoulders shrug and the elbows rise. From this full extension, the lifter drops immediately into a squat for the catch. The weight employed can eventually exceed the 100 percent figure for the clean.

Clean

This drill should not be conceptualized as a power clean transitioning into a front squat. It should be conceptualized as a proper pull, a catch in the bottom and an immediate rise to erect stance. If enough work has been performed on the previous two movements, this final transition to the classic clean should be relatively easy.

In Closing

The training of technique is often misrepresented and as such can provide unnecessary difficulty. Coaches who don't know how to coach proper technique consider it difficult to learn.

In comparison to the technique coaching in sports such as gymnastics and diving, the snatch and clean and jerk are not that difficult to coach. In programs where highly talented athletes are selected, the learning of proficient technique is not especially difficult. Athletes from sports in which they learn complex technical moves by simply watching and imitating have little difficulty learning the snatch and clean and jerk. Most of the problems develop when athletes who are not good motor learners attempt to master the lifts under the supervision of coaches who are not used to coaching technically challenging movements.

✦

Marta Takano

About the Author

Bob Takano has developed and coached some of the best weightlifters in the U.S. for the past 39 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's coached have earned Division 1 volleyball scholarships. His articles have been published by the NSCA and the International Olympic Committee and helped to establish standards for the coaching of the Olympic lifts. He is a former member of the editorial board of the ***NSCA Journal****, and an instructor for the UCLA Extension program. He is currently the chairperson of the NSCA Weightlifting Special Interest Group. He is a member of Mike Burgener's seminar team for the CrossFit Olympic Lifting Trainer Course. Website: www.takanoathletics.com.*

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

THE CrossFit JOURNAL KIDS

Powerball

This game requires the fitness of a CrossFit athlete and the poise, accuracy and game sense of a skilled basketball player.

By Dan Strametz and Mikki Lee Martin CrossFit Kids **May 2013**

Staff/CrossFit Kids

Equipment

- 2 cones
- 2 Gator Skin dodgeballs
- 1 large bucket or tub (an upside-down plyo box will also work)
- 2 trainers

Set-up

1. Place the cones on opposite edges of an area measuring 20 by 20 feet.
2. Place the dodgeballs at the cones.
3. Place the bucket (or upside-down plyo box) at midfield.

Objective

Score the most buckets as possible within the given time.

Game Play

1. Divide the class into two teams and line them up at the cones.
2. Position the two trainers on either side of the bucket, facing the teams.
3. Players take turns performing the assigned exercise (usually 3-5 reps of squats or burpees) at the cone.
4. Upon completing the given exercise, the player picks up the dodgeball and attempts to put it in the bucket. Trainers defend the bucket much like in basketball. A point is scored for each ball scored in the bucket. A turn is over once the ball leaves the player's hands, at which time that player returns to the end of his team's line.

Notes

1. Trainers should adjust their blocking intensity according to the age and capacity of the players.
2. Institute a time constraint if needed. For example, a shot must be attempted within one minute of player possession.
3. For larger groups, three to four lines may be used and additional trainers added.

♦

Subscription info at journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

THE CrossFit JOURNAL

Want to Be Good at Oly?

Two-time Olympian Chad Vaughn details four areas of focus he believes will help you add weight to your snatch and clean and jerk.

By Chad Vaughn **May 2013**

Staff/CrossFit Journal

Most athletes dive into the Olympic lifts without considering what really allows someone to lift the heaviest loads and move efficiently through high-rep workouts.

I have four keys to lifting the heaviest weights and moving well in the snatch and clean and jerk. I believe they should be used as primary points of evaluation that will need to be built upon.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

To start, ask yourself these questions:

1. Do I need mobility work or am I at least somewhat comfortable in all the extreme positions for these movements?

2. Do I "rip" from the floor?

3. Do I hurry to set up or get into positions?

4. Is my mind overwhelmed or my thoughts scrambled from trying to accomplish too many things at once?

5. Do I need to calm down?

1. Receiving Positions

When talking about the receiving position, I often use the term "rock bottom." What I mean is the depth you would reach if you performed a full-range-of-motion squat. Many—maybe most—are confused about where this is, especially given the misconceptions about squatting deep.

A full range-of-motion squat is not quads reaching parallel or the hip crease below the knee. In Olympic lifting, this is like someone performing a push-up without touching the chest to the floor. Yet, while that example is understood as not meeting full range of motion, things are less clear when dealing with the bottom of the squat as it relates to Oly lifting.

When it comes to the standard that dictates the hip crease should be below the knee, I believe many coaches and athletes have taken the phrase too literally—as in the squat has to be that specific spot: no higher, no lower. I would argue this is simply the minimum acceptable depth for a squat. It doesn't mean you shouldn't or can't go lower.

In fact, I remember my lead CrossFit Level 1 instructor in 2010 telling me, "You have the best air squat I've ever seen." I was, of course, at rock bottom, as any weightlifter would be. He didn't tell me I shouldn't go below a certain position. I understand the difficulty in teaching a rock-bottom squat to large numbers of people as most can't get there with

Mike Warkentin/CrossFit Journal

While holding the position in Frame 1, this athlete was asked to squat lower. The resulting position (Frame 2) will be much more useful in snatching very heavy loads.

good form in the beginning. But if people want to prepare for their heaviest and most efficient snatch and clean, they should move in the direction of full range of motion on all squats.

So how do you know how low is low enough? Almost daily, I hear, "Am I low enough?" Nearly 100 percent of the time, the answer is, "No." If you are low enough, you'll know because you can't go any further. Another popular question: "So you want me to go that low all the time?" The answer for me is always, "Yes."

If you're spending more time on mobility than actually working out, you need to check your range of motion and hold yourself to better standards while lifting.

A regularly occurring statement: "OK, but you'll have to tell me when to stop going down." As I immediately agree, I wish I could bet someone $1 million that I'll have to say "lower" at least five times.

If you need visualization, watch toddlers. You'll likely catch them hanging out in this "too low" position. They could do it all day, usually with the feet in a perfect squatting stance. This is a natural position in which all humans were meant to be. It's not bad for the knees or a position you should avoid. It's the opposite. The human body is capable of this range of motion regularly.

Unfortunately, some people lack flexibility either because of their athletic backgrounds or past experiences. Understand that if you've been doing partial-range-of-motion squats for years or many reps, your body has likely adapted to that range. Still, we can get you moving through your full range of motion on all your squats—you'll simply be working flexibility on every rep.

And while there are all these fancy stretches and mobility drills out there, the fact is mobility should be in every movement. That is not to say you shouldn't stretch, but if you're spending more time on mobility than actually working out, you need to check your range of motion and hold yourself to better standards while lifting.

Why do you think elite weightlifters are known as the second most flexible athletes in the Olympics behind gymnasts? Weightlifters often are asked what they do for mobility; many do nothing. That doesn't mean we shouldn't or couldn't benefit from improved mobility in specific areas, but we squat, snatch, and clean and jerk in a way that's necessary for us to lift the most weight—it's mobility with a barbell.

Staff/CrossFit Journal

Chad Vaughn demonstrates a rock-bottom overhead squat with 285 lb.

Mike Warkentin/CrossFit Journal

A good Romanian deadlift is characterized by vertical shins and shoulders in front of the bar. The lats are engaged to keep the bar close to the body.

2. The Romanian Deadlift

The most important position of the snatch and clean is the transition point when the bar is right above the knees. This is where the lifter goes from lifting the bar with the legs and holding the position with the back to putting speed and power into the bar as he stands with his posterior chain. I'm looking for vertical shins, the bar close to the body and the shoulders in front of the bar. One way to strengthen and reinforce this position is via the Romanian deadlift (RDL): from a standing position, lower the bar to that point right above the knees and then go back up. Go lower for extra strength and flexibility work.

In my world, an RDL is defined as a form of the deadlift in which the body is bent at the hips while the knees are only slightly bent, requiring more back and hamstrings to move the weight down and up.

Some athletes will first need more flexibility in the hamstrings to be able to even push the knees back enough while leaned over the bar with the back locked in and the shoulders in front of the bar. Keep in mind we don't need "just enough" flexibility to create that specific position but rather excess. If you can create this position but it is 100 percent forced—meaning you can't go any further and it's uncomfortable—that's great. That "forcing" is going to work flexibility. But, be aware that as hard as it is for many to learn to create this position from the top down, the body will hesitate even more, or likely not go there at all, from the floor as you lift the bar up to perform the full lift. In this case—and in the case of those who might not even be able to get vertical—RDLs are even higher on the priority list.

We use the RDL for position and movement strength, but not just in the hamstrings and the rest of the posterior chain. Get into bottom position of the RDL and relax your lats so your arms are hanging straight under the shoulders; the shoulders should be in front of the knees. How far from

your body is the bar? Maybe a foot or more. We have to push the bar back to keep it as close to the body as possible in the strongest "lever" position. With heavier weight, the bar will, of course, want to drift away. And even though you will only be moving through this specific point briefly as you perform the whole lift, we need as much insurance as possible. This is so critical that you should be able to get into this position and hold more than 100 percent of your snatch or clean with either grip while keeping the bar pushed against the body for at least five seconds.

We have to push the bar back to keep it as close to the body as possible. With heavier weight, the bar will want to drift away.

Be aware this number must be met without cheating the position. This means that if the knees are pushed too far forward (the shins are not vertical) or the shoulders are behind, directly over or just not in front of the bar enough, keeping the bar close becomes much easier. But remember this indicates the bar is no longer in the correct path and your body is no longer in the position of best leverage and activation.

Also, if you are back on your heels too much and have created a backward angle with the shins, you are actually bringing the shoulders back over the bar instead of in front of the bar. This is only OK in an RDL in which you are going past the knees or to the floor, as it will activate the hamstrings/posterior chain differently. But again, you are now out of that best path and position.

What I recommend when doing an RDL for ideal positioning and technique strength is to just focus on the range of motion from standing down to that transition point (bar above knee). Get to that point, hold three to five seconds, and then come back up while maintaining the perfect body position established at that lowest point.

3. Slow Down … Then Speed Up

A big part of coaching is cueing. Some of the best coaches have the best cues and can throw them out at the right time. To me, a good cue is one that can fix more than one thing—maybe even five or more—without specifically telling the athlete to change any of those things individually. I find "slow down" is the best cue when it comes to fixing the most faults at once—if you can actually get the athlete to do so. The concept is that the slower the athlete moves, the more likely he is to maintain tension, position, bar proximity and overall quality of movement. Speed often leads to errors.

It's confusing because these lifts are supposed to be fast—but not at all points. I am talking about control for the snatch and clean from the floor up to the transition points above the knee. For the jerk, control is from the standing position to where you change directions at the bottom of the dip. This control is especially important for the beginner as consistency is an issue, and slowing down improves the learning process. It's also a great way to help build strength in better movement patterns.

Realize speed alone is not what makes the lift within these ranges of motion. Tension, position and bar proximity are far more important first. You have the potential to move faster and to produce far more power from better and more-activated positions. This principle can be seen in athletes who can lift more from the hang than from the floor, which typically means they're missing the ideal transition point coming from the floor—something far more likely as they go faster.

Realize speed alone is not what makes the lift. Tension, position and bar proximity are far more important first.

If all their positions and movements are good but they're still lifting more from the hang, either their timing or rhythm is off. What I mean by rhythm is the speed of the bar at any given point in the pull as related to the movement as a whole. If you are ripping the bar from the

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Mike Warkentin/CrossFit Journal

The Olympic lifts are fast, but control from the floor to the knees will allow you to be in the best position for vicious extension upon reaching the power position.

floor with your arms—even with all else being correct, and especially with your heaviest weights—you will most likely have deceleration on the bar at full extension.

If the bar is not slowing down with some of your heaviest lifts, this tells me you're stronger and more powerful than the weights you are lifting. In other words: you're not lifting as much as you could be. As hard as it is to believe, we accelerate the bar more with a shorter range of motion with our heaviest weights.

What I am looking for when I lift and when I coach is the building of speed, starting with more control from the floor and then really turning it on at some point above the knee. What I see most is a focus on going fast from the floor. When I can get an athlete to slow down from the floor, I usually see a rhythm of slow plus slow. Instead, what I want is slow plus fast plus faster. For most beginners, I emphasize excessively slow plus fast. What this looks like is about three seconds from the floor up to above the knee or mid-thigh and then flooring the gas pedal. This is for learning purposes. We can speed up or modify the rhythm later when the athlete is moving consistently.

In strength and technique work, slowing down means taking your time to set up, get into position and follow the progressions. Better positions will improve the learning process, help you accelerate the bar when it is most needed and even conserve energy in low-weight, high-rep workouts.

4. Simplify Your Focus

There are times when I can almost see someone's head spinning before snatching, cleaning or jerking. The lifter is reviewing every concept and position or things he doesn't want to do during the lift. Maybe the athlete has specific triggers—usually one-word focal points—which is good. But it's easy to have too many.

How many things are actually going on during the entire snatch? Let's say you have 10 or even just five of those thoughts haunting your mind. That's overwhelming. If I sense those wheels turning too much, I usually stop the athlete to narrow the focus before he grabs the bar.

I find myself on occasion doing this when I'm practicing muscle-ups. To me, a muscle-up is as complex as a snatch. But because I have the ability to focus through a snatch, the muscle-up is just a reminder to me of what it feels like to be scrambled or to try to perfect too many components at once. I have to stop myself, erase my thoughts and then bring back only the few that are most important at that time.

This simplifying is necessary, especially when performing your heaviest lifts or low-weight/high-rep efforts. The time for more thinking is with lighter weights in smaller sets, and thinking is even more appropriate with partial movements that allow for a more narrow focus.

Choose no more than three concepts you can simplify into one word or thought. Fill your head with those concepts and work to execute each one. This will allow you to perform the movement to the best of your ability.

So what's most important? It all comes down to the basics and the things people miss the most. These things often are the same for beginners as they are for advanced athletes, just to different extents. When it comes down to it, you have to be tight on the floor or locked in at your standing set-up position for the jerk, you have to create the best transition point that you can, and you have to reach full, aggressive extension.

Notice that none of those points has anything to do with what should be considered the "reaction portion" of the lift. The reaction must be automatic; if your awareness is in the reaction portion, you will most likely miss something and waste energy. If you are trying to control the reaction, you will inevitably hinder or slow it. If at all possible, focus only on what you can and should control.

Choose no more than three concepts you can simplify into one word or thought. Fill your head with those concepts and work to execute each one.

There are some cases, though, where an emphasis on the reaction side of the lift might be necessary; for example, if the feet move excessively with a jump forward, back or out. But the rule still applies: no more than three focal points. Also keep in mind drilling to fix this problem would need to be done with lighter weights, partial movements and perhaps flexibility or strength training, which often gets to the very root of the problem.

Staff/CrossFit Journal

Good coaches develop clear cues that fix problems and help athletes improve movement.

A few cues on this part of the lift can aid in what's happening at or before power exertion, meaning they can be used with heavier weights and within full movements as one of your three cues. Examples would be "aggressive feet" and "meet the bar higher." For most, these cues will lead to more extension and speed/aggressiveness through extension.

As for the actual words, they will be customized for each athlete or for the fault that requires the most attention. For me, depending on how my mind is working on any given day, I might just fill my head with "tight" (from the floor) and "aggressive" (at extension). If I'm struggling with something, I might need to add that third focal point and be more specific with my cues. For a beginner I might say, "Slow, close, long": slow from the floor, keep the bar close, and exaggerate the opening of the chest or the extension for a longer period of time.

Also make sure cues and triggers are not scrambled. They have to be in order; this keeps your awareness with the bar, where it should be.

Another concept I use for myself and as a coach on occasion is to think nothing. In many cases this works well, but only for one or a few reps. It's also a little dangerous as this means you have no "mental shield." If your head is filled with two or three things, all your energy is going into accomplishing those things. On the other hand, if there is nothing in your head, a negative thought or outside distraction can slip in and lead you astray.

It's a process in itself to find the focal points that work best for you, and keep in mind that they will change as you change. But the more mobile you become and the more automatic your positions become, the simpler your focus can be.

Long-Term Investment

A comment that seems to haunt my world: "Hey, coach. I hit a PR, but I'm glad you didn't see it!" Maybe the athlete power cleaned it because the body hesitated to go to that unfamiliar depth, or maybe he or she pressed out or chased a snatch forward due to a bad lockout. I'm not impressed or happy for you. Sorry.

This is a process—a long process for many. Evaluate yourself and take it step by step, even if it means you have to go backward. This is about future potential, not immediate weight improvements.

On the other hand, I'm a proud and happy coach when an athlete tells me he or she is getting deeper, feeling more comfortable with the bar in the front rack or overhead, or finding proper positions feel natural rather than forced.

✦

Mike Warkentin/CrossFit Journal

About the Author

Chad Vaughn is a two-time Olympian, a seven-time national champion and an American record holder in the sport of Olympic weightlifting. He was introduced to CrossFit in 2008 and began working within the community in early 2010. Chad is part owner of CrossFit CenTex in Belton, Texas, where he holds weekly weightlifting classes while doing occasional seminars throughout the U.S. Chad has a natural, matured understanding of how the body best moves and is highly motivated to help anyone find his or her perfect snatch and heftiest clean and jerk.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

THE CrossFit JOURNAL

NSCA "CrossFit Study" Fraud?

Researchers at Ohio State University refuse further comment on CrossFit study amidst allegations of inaccurate data from the study's own coordinator.

By Russell Berger **May 2013**

A few weeks ago, I learned that the American College of Sports Medicine (ACSM) had published a study on CrossFit's efficacy in the National Strength and Conditioning Association's *Journal of Strength and Conditioning Research*.

The study—CrossFit-Based High-Intensity Power Training Improves Maximal Aerobic Fitness and Body Composition—was conducted by Michael Smith, Ph.D., a then-Ph.D. candidate at Ohio State University working under Steven Devor, Ph.D. and Fellow of the ACSM. Dr. Smith partnered with a local CrossFit affiliate, CrossFit 614, to create a study based on an annual 10-week challenge the gym holds.

The results of the study are rather anticlimactic. In simple terms, the study claims that CrossFit not only improves body composition and VO_2 max, but it also does so more effectively than high-intensity interval training (HIIT) programs. In other words, CrossFit works. This isn't news to most people, especially those who have tried CrossFit or know someone who has.

Nonetheless, much of the study struck me as odd. For example, if CrossFit training is so new to academia, why did the authors create the unexplained, redundant phrase "high-intensity power training" (HIPT) to refer to it? Why not just call it what it is: "CrossFit"?

Curious, I turned to CrossFit's chief scientist, Dr. Jeff Glassman. Dr. Glassman, a specialist in applied mathematics, applied physics and information theory, has spent much of his career focused on the philosophy of science, an interest that uniquely qualifies him to identify pseudo-scientific practices and claims. After analysis of Dr. Smith's work, Dr. Glassman wrote a formal, comprehensive response to the study.

The response, which makes numerous claims about the validity and rigor of Dr. Smith's paper, focuses heavily on this particular section:

"Out of the original 54 participants, a total of 43 (23 males, 20 females) fully completed the training program and returned for follow up testing. Of the 11 subjects who dropped out of the training program, two cited time concerns with the remaining nine subjects (16% of total recruited subjects) citing overuse or injury for failing to complete the program and finish follow up testing."

> The study also does not detail what specific cases of "overuse or injury" the subjects cited, what caused them, whether the cases were pre-existing conditions, or how long the subjects experienced "overuse or injury."

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

What is "overuse or injury"? The study does not define what it means by the term "overuse." The study also does not detail what specific cases of "overuse or injury" the subjects cited, what caused them, whether the cases were pre-existing conditions, or how long the subjects experienced "overuse or injury."

Despite the ambiguity of this language, most readers would agree that a 16 percent injury rate demonstrates significant risk for an exercise program. Referring to this as a "notable" percentage, the researchers seem to assume this view. They go on to claim that there "are emerging reports of increased rates of musculoskeletal and metabolic injury in these programs."

This quote, taken from the ACSM paper *Consortium for Health and Military Performance and American College of Sports Medicine Consensus Paper on Extreme Conditioning Programs in Military Personnel*, shows the author's hand. The "CHAMP paper," as it is called, is a beleaguered piece of pseudoscience Dr. Glassman has thoroughly deconstructed in the *CrossFit Journal*—to no response. Interestingly, William J. Kraemer, Ph.D., is both the co-author of the CHAMP paper and the current editor-in-chief of the *Journal of Strength and Conditioning Research*, which published Dr. Smith's CrossFit study.

Having operated a CrossFit affiliate myself for three years and being a longtime member of the CrossFit community, I was skeptical of such a high injury rate. Worse, the ambiguity of "overuse or injury" adjacent to a direct implication of injury in what Dr. Glassman refers to as "an ACSM hit-piece against CrossFit" seemed troublesome. I decided to call Mitch Potterf, owner of CrossFit 614, to ask a few questions. Potterf was happy to give me his perspective on the study.

"I haven't hurt nine people in four years," he told me.

Potterf explained that he first learned the study had been published when a non-CrossFit gym in his area cited it on Facebook as a reason to avoid training at CrossFit 614. Frustrated, Potterf called Dr. Steven Devor, the corresponding author for the study. Potterf recalls the conversation well.

"Right away he told me that the study didn't actually say that **CrossFit** (emphasis added) had caused the injuries," Potterf said.

Potterf says Devor went on to explain that "this (the study) is really good for CrossFit."

Potterf says he told Devor, "This isn't good for me because you're saying I hurt people, and I didn't." Potterf said Devor even claimed he would "post a retraction if he needed to."

Potterf also explained that, contrary to what the study said, no ACSM researcher was ever present for any of his affiliate's training. The participants went to an Ohio State lab once at the beginning of his gym's 10-week challenge, and then went once more for a re-test at the conclusion of the study. The nine participants whom Dr. Smith vaguely categorized as having dropped out for "injury or overuse," were part of a total of 11 participants who didn't show up to re-test.

After about a week of emails, (Potterf) had documented each person's reason for not attending the re-test. Not one reason included injury.

I asked Potterf if he could remember who the individuals were and contact them for me. He did, and after about a week of emails, he had documented each person's reason for not attending the re-test. Not one reason included injury. Skeptical of Potterf's own potential bias, I checked in with a few of the subjects on Potterf's list, and they all confirmed that they were not injured but had failed to show up to the final test due to a lack of time or interest.

With each person who failed to attend the re-test claiming he or she had not been injured, Dr. Smith's data was beginning to look suspiciously inaccurate. It was as if the wording "injury or overuse" had been crafted to allow Dr. Smith to imply injury where there had been none.

But there was an even more pressing question. Potterf explained to me that the study was "blind," meaning the researchers in the lab were only able to identify participants by a single number. If the 11 subjects who failed to show up for the test-out were de-identified in this way (and obviously not present at the Ohio State lab), how could Dr. Smith collect any data on the reason for their absence?

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

> If the 11 subjects who failed to show up for the test-out were de-identified in this way (and obviously not present at the Ohio State lab), how could Dr. Smith collect any data on the reason for their absence?

Potterf agreed to put me in contact with Chelsea Rankin, a member of CrossFit 614 who worked as a clinical research coordinator for Nationwide Children's Hospital for five years. Because of her experience, she volunteered to be the study coordinator for Dr. Smith. During our conversation, I asked Rankin how Dr. Smith could have gathered data on why the 11 didn't show up to the lab.

"I'm the only one that knew who did or didn't show up. The participants were de-identified and were only known to the OSU researchers by a number. They (OSU) may have spoken to people there while they were doing the post-test, but they never had contact with the people who didn't show up, and I have no idea how they could have."

After I asked a few more questions, Rankin gave me her own opinion on Dr. Smith's work: "I did all the data collection for the study, and I know every person who didn't re-test. It was easy to figure out they weren't injured. This data is inaccurate. Those individuals were not injured, and that wasn't the reason they didn't test out. To me this questions the validity of the research."

What had at first sounded like ambiguous and editorialized injury data was beginning to look like fraud. Unable to think of a less malicious explanation for the discrepancies between the statements of the study coordinator and the data published in the study, I attempted to contact the researchers directly. I emailed Dr. Smith, who now works as a professor at Gonzaga University, and he immediately responded: he said he was not interested in an interview and requested that I not contact him again.

Luckily, the corresponding author, Dr. Devor, consented to a recorded phone interview, the full transcript of which is available here. Dr. Devor was polite and happy to answer my questions on the study. As he did with Potterf, he was quick to explain that the study, in his opinion, was good for CrossFit. Unlike his conversation with Potterf, Devor immediately attributed the injuries in the study to the CrossFit program, noting with a tone of certainty that the high injury rate was attributable to the intensity with which the program had been performed.

More problems became apparent during our conversation. When I asked him about the collection of data from the 11 participants who did not re-test, Dr. Devor did not seem confident in answering.

Russell: So, was this a blind study? Were they de-identified in this study?

Dr. Devor: Well, we, we don't know who the ones are that—. Well, no, we do. Well, we were blinded. I'm trying to remember back now, Russell, because it's been a while. We were blinded to their names, but we obviously saw them in the lab. I mean, they came into the lab, and tested them several times. And the ones that dropped, you know—. When we then, when they said, "OK, we're not coming back," we would query them, "OK, well, why?" Like, you know, "You gotta give us, like, why the hell aren't you comin' back?" kind of thing, and they all said, you know, again—. A couple of them were like, "No, I don't have time, I'm not going to do it," which is not uncommon.

Russell: So you collected the data on those reasons for why in the lab?

Dr. Devor: Absolutely. We queried them on why they weren't coming back.

Here, in a conversation with one of the researchers responsible for this study, we ran into the same logical problem: how did Dr. Smith, armed only with the identity of those participants present in the lab, collect data, in person, from individuals who were not present in the lab? At this point, Dr. Devor began waffling considerably and eventually deferred completely to Dr. Smith.

Dr. Devor: Yeah, we—. You're right. You're exactly right, Russell. They did not come back. And so then, when we would get a hold of them, or query as to why they didn't complete—that's what we were told—that they never—. You're right, they just never showed back up.

Russell: So, I guess my question then is, she (Rankin) said they (study participants) would be de-identified to you, and you only recognized them as a number, so you wouldn't have had any contact information in order to get that from them?

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

> How did Dr. Smith, armed only with the identity of those participants present in the lab, collect data, in person, from individuals who were not present in the lab?

Dr. Devor: No, that's not true. No, we, we were able to get a hold of them, because that's how we knew that they didn't—. That's how we knew—. That's how we were able to get in touch with them, because we did know their names. Because, you're right, it wasn't blinded, because they were in the lab and we were collecting, and they were getting a VO_2 max test, getting body comp, we were talking to them. So we knew who they were.

Russell: But that was only for the first test that they were there to be able to talk to you, and you heard who they were by their first name. Chelsea says that—I'll quote her here—she says, "I'm the only one that knew who did or didn't show up. The participants were de-identified and were only known to the OSU researches by a number." So that means that—

Dr. Devor: Well—

Russell: You knew them as a number. And if they'd been there, she actually said that—. Let me read you the second quote here. She said, "They," referring to you guys, the OSU researchers, "may have spoken to people while they were there doing the post-test, but they never had contact with the people who didn't show up, and I have no idea how they could have." So I followed up on this, and I have a list of eight people who I've identified from the study who did not show up for the retest or dropped out of the study. And I've been able to contact four of them so far, and all four of them said that they never supplied any reason to anyone as to why they didn't complete the study, because they never spoke to the researchers again.

Dr. Devor: I—. Well—. They never spoke to me, because I didn't collect the data.

Russell: Right, well, they didn't mean you. They meant they never spoke to anyone who was a representative of the study to supply even a basic reason why they didn't complete it.

Dr. Devor: Yeah, Russell, I'm going to—. I don't—. I mean, I guess, I can't answer that intelligently, because I'm not the one that collected the data. And I'm not trying to skirt your question, because you have a legitimate question.

Russell: OK.

Dr. Devor: I just didn't—. I'm not the one who collected the data.

Russell: OK, so who's effectively responsible for being able to defend the study and its accuracy?

Dr. Devor: Well, that would—. Mike Smith is the one who collected the data.

Russell: Right, when I talked to him about it, he refused to comment. That's the only reason I called you

At the end of our interview, Dr. Devor suggested that I speak with Dr. Smith, whom he insisted would be able to answer all my questions. He even offered to help put me in touch with him. Considering the difficulty Dr. Devor had explaining the origin of Dr. Smith's data, the claim from the study coordinator and study participants that the data was fabricated, and my own inability to explain these two points in any reasonable way, I assumed Dr. Devor would begin working on a quiet retraction. To my surprise, I received this email from Dr. Devor two days later:

> *Russell,*
>
> *I have spoken with Dr. Smith at Gonzaga University. We will have no further comment on our Journal of Strength and Conditioning Research (JSCR) CrossFit publication.*
>
> *We have published a completely unbiased, no agenda, thoroughly peer reviewed scientific paper in what is likely the most highly thought of scientific strength and conditioning journal. We stand behind all of the data that we either collected or that was reported to us. And in spite of what some might think, we have absolutely no reason to misrepresent any aspect of our publication to anyone.*
>
> *We believe our paper provides a very positive outcome for the CrossFit industry. Our data clearly demonstrates many positive health and fitness outcomes are achievable by those that appropriately engage in high intensity power training (HIPT).*

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

However, we also believe appropriate caution should be used when anyone engages in HIPT.

Thank you for your time and the opportunity to contribute to your writing.

Regards,

Dr. Devor

In two days, Dr. Devor had gone from conceding that I had a legitimate question and assuring me that he would help answer it to defending his apparently fraudulent data solely on the merit and authority of the journal in which it was published. What happened in the interim, we can only speculate.

In two days, Dr. Devor had gone from conceding that I had a legitimate question and assuring me that he would help answer it to defending his apparently fraudulent data solely on the merit and authority of the journal in which it was published.

Certainly, some of the study's conclusions appear favorable to CrossFit, but attempting to appease critics by pointing out favors within the study's conclusions only dodges the question of his allegedly fabricated data.

The importance of this investigation to CrossFit cannot be understated. To date, the two most prominent CrossFit studies—the CHAMP/ACSM paper and Dr. Smith's ACSM study published by the NSCA—both contain all the appearance of legitimate science, yet they contain no substance. Worse, both the CHAMP study and NSCA publication are behind paywalls, reducing the likelihood that an average person will analyze the documents for himself or herself. The result is an undeserved facade of academic respectability that has fooled anyone too busy to thoroughly investigate the work of the ACSM and NSCA.

Those who have cited the study certainly have reason to demand answers to questions about the validity of the study's data and conclusions.

Google finds nearly 8,000 cases of websites citing the Smith et al. study by its exact title. From what we can tell, the study duped most everyone with questionable conclusions that remain unexplained.

Those who have cited the study certainly have reason to demand answers to questions about the validity of the study's data and conclusions. Unfortunately, the authors have chosen to respond with silence:

"We will have no further comment on our Journal of Strength and Conditioning Research (JSCR) CrossFit publication."

✦

About the Author:

Raised in Atlanta, Russell Berger spent four years in 1st Ranger Battalion and saw numerous combat deployments. After leaving the military in 2008, he opened CrossFit Huntsville, where he spent three years as head trainer. He now works full-time for CrossFit HQ.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

THE CrossFit JOURNAL

CrossFit Kids as a Physical-Education Curriculum: A Pedagogical Perspective

Phil Eich makes a case against traditional physical education, in which sports form the foundation but provide little motivation toward lifelong fitness.

By Phil Eich **May 2013**

CrossFit Texas

All great teachers want to improve the lives of the students entrusted to their care—the ultimate goal being that the lessons learned during the academic day will carry over into their lives outside school. Teachers want to improve and preserve the physical, emotional and academic wellness of their students.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

As educators searching for the best methods and practices, we need to begin with an educational philosophy. Within the field of physical education, I believe there are two basic pedagogical models: traditional and literal.

The Traditional Model

The traditional model uses sports and games as a pedagogical foundation. Physical education in this model begins with an activity created outside the body (sports and games) in an effort to improve something inside the body (physical skills and fitness). Typically, the curriculum of the traditional model uses sports and games as units, with students learning various rules, strategies and techniques specific to each sport or game throughout their education. The theory behind this model is that exposure to and a basic proficiency in these activities will improve physical well-being and create a desire in children to participate in various health-improving activities outside the classroom and into adulthood.

Carole Laney

Functional movements provide an alternative to the sport-specific physical skills most children learn in school.

The Literal Model

Literally, "physical education" means the teaching and learning of the use and care of the body, and so the literal model builds on one of the body's most basic functions: movement. Traditionally, movements taught within the physical-education class are sport specific (swinging a bat, throwing a ball, shooting a basket). The literal model, however, uses the most basic movements of the body because they have the most direct and broad application to all life's experiences. Foundational movements of the body—such as squatting, pushing and pulling—are found both in athletic environments as well as within the physical requirements of everyday life. In the literal model, the priority given to the foundational movements of the body will increase proprioception (the internal awareness of movement) and kinesthetic awareness (the external awareness of the body in time and space) as well as work capacity. Developing physical competency in these basic movements translates into increased fitness, improved physical abilities and injury prevention.

A Foundational Comparison of the Traditional and Literal Models

The Traditional Model is Extrinsic

Sports and games are an extrinsic construct imposed upon the human body. Rules, sport-specific skills and movement limitations are created outside the body and interact to create physical constraints that the body is forced to operate under in order to fulfill the criteria or achieve the goals of a specific sport.

While sports and games certainly are necessary, fun and beneficial, within the context of physical education, the traditional model's foundational use of sports and games is inherently deficient because it attempts to use as a primary method of instruction these limited, extrinsic constructs. The infinite expressions of movement that the human body is capable of producing are not given opportunities for articulation because sports, by definition, carry with them physical limitations. For example, part of what makes baseball baseball is that one person throws a ball, one person swings a bat, a couple of people run, one person makes a catch. Swing, run, throw, catch.

Sports carry with them inherent physical limitations. Although many sport-specific skills have some transfer to life or general athletic movement, the use of sports as a primary mode of physical education creates a danger of overspecializing, which can limit physical development.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

CrossFit Utah Valley

Teaching kids functional movement will be more conducive to long-term health than teaching them how to score a game of bowling.

For example, the exact skill of shooting a free throw is only found in basketball, but being able to throw a ball to a target some distance away certainly has athletic benefits. The danger to overall development is in specializing only in shooting a free throw or in failing to see that throwing various objects with accuracy will make one more suited to many sports and even some aspects of life. A common question in the classroom (usually to the dismay of teachers) is, "When we will use this in life?" If an educator honestly asks this question of sports and games as they are presented in the traditional model, the limited "outside the classroom" benefits of teaching children how to wave a ribbon stick or shake a parachute are immediately seen.

The limited "outside the classroom" benefits of teaching children how to wave a ribbon stick or shake a parachute are immediately seen.

CrossFit Nuernberg

Traditional P.E. is often only fun for kids who are good at specific sports. CrossFit Kids makes functional movement fun and prepares children for a lifetime of fitness.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Inner West CrossFit

Unlike shooting a basket, functional movements can be scaled to the age and ability of the child.

Some will argue that learning sport-specific skills will make better baseball and basketball players, which will encourage children to participate in sports and therefore improve their physical lives—but remember, the goal is to promote a lifelong love and pursuit of physical health for every child, and it would be short-sighted to think that "being good at sports" is the only way to produce a value of physical health into adulthood. In fact, the most common forms of physical activity performed by adults are not sports but rather walking, gardening and yard work, and other forms of exercise (7).

Sports and Games Cannot Be Differentiated According to Interest and Ability

Before gym class has even started, the teacher using a sport as the primary vehicle of physical learning has created an interest/ability discrepancy: the kids who are able can and will; the kids who are unable can't and won't. Without a differentiation of instruction, there is no way to bridge the gap.

Sports and games cannot be differentiated to each individual child's abilities in the class context. Here is a hoop, there is the ball; the ball needs to make it through the hoop. The children who play on the after-school basketball team or the "big kids" love basketball days in gym class—they know they will be successful because they practice often or are physically mature enough to succeed relative to others in their age group (i.e., the big kids always win). Children who haven't yet developed the physical strength to even get the ball to the net have a bad day in gym class because they cannot be successful in the way that basketball primarily defines success—making baskets.

How does a teacher help the low-achieving child in this situation? There is no way to scale this sport to ability level—one is not able to lower the basket, slow the game down or give extra opportunities for practice. So, unable to differentiate instruction, the well-meaning teacher often offers support to the despondent child in the form of platitudes such as, "Just have fun," not recognizing the triumph of human nature necessary to take enjoyment in doing something embarrassing (something adults have an even harder time with). This is especially true during years of childhood where these sports and games often serve primarily as a social activity.

The Traditional Model Contributes to the Detrimental Effects of Early Sports Specialization

In America, there are currently 30 million children participating in youth sports. In children 14 and younger, 3.5 million of those suffer a sports-related injury (14).

Why is this happening? It is currently the societal thinking that specializing a child in a sport at a young age will yield improved athletic results at a later age (4). Looking at the science of sports performance, this is simply not the case.

Typically, when children specialize in a sport, three things can happen. First, they improve at the sport faster than peers who are not specialized. This is to be expected as

practice makes perfect. However, as children grow older, their rate of improvement decreases and their proficiency begins to balance out with their peers because they lack a comprehensive movement "vocabulary" that can be applied to more advanced movement or used to improve current movement patterns. This idea of acquiring and expanding a physical vocabulary is similar to the necessity of vocabulary expansion in verbal communication. The fourth-grader who talks more than his or her classmates will often be better at communicating. But if that fourth-grader specializes in the vocabulary he or she possesses while ceasing to learn new words, new combinations of words and phrases, or different verbal structures, eventually the rest of the class will catch up and surpass the child in the ability to communicate.

The second possible outcome of early specialization is overuse injury (1,3,11,12). The combination of developing bones, muscles and joints; still-developing technique; and a rigorous, repetitive and sometimes year-long practice and competition schedule subjects the young athlete to an environment that whittles away physical health. Not only does this place the child at an unethical increased risk of injury, but also when injuries do occur, future athletic potential is limited as the athlete mentally and physically tries to cope with chronic injuries instead of improvement within a sport.

Third, athletes can psychologically burn out (4,15). Their chosen sport ceases to be enjoyable and they quit; here, athletic potential is not hindered by a physical injury but rather a mental one that could ultimately curtail all physical activity.

Subjecting the body to chronic overuse of some movements (and therefore overuse of specific muscles and joints) and chronic underuse of other movements disturbs the natural balance of the body. If all the major movements of the body are not performed and improved at an approximately equal rate, the body progresses out of

CrossFit Utah Valley

Functional movements mimic patterns seen in daily life, and a good coach can easily scale these movements to the level of each participant in a group.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Phil Eich

Spiking a volleyball has limited applicability off the court. Learning how to engage the muscles of the core has infinite value outside the gym.

balance with a limited physical vocabulary, increasing the risk of injury and limiting physical potential.

All this leads to a question: if traditional sports and games can't be a successful pedagogical foundation, what can be?

> Rather than using sports, the educator applying the literal model begins with movements that are intrinsic and naturally occurring.

The Literal Model Is Intrinsic

The literal model is intrinsic (inside the body) because it begins with and allows for the many expressions of natural, functional movement and holds that if functional movements are practiced and performed efficiently, increased fitness and physical potential will follow. In the classroom that builds on the literal model, all the body's foundational movements—pushing, pulling, squatting, lunging, bending—are constantly and consistently performed by every student. These basic movements are not contrived, forcing the body to repeatedly do things it does not naturally do. These movements originate in the natural design of the body and are the most effective and efficient movements the body can produce. Rather than using sports, the educator applying the literal model begins with movements that are intrinsic and naturally occurring, regardless of physical context.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

This philosophy of basing pedagogy on natural functioning is similar to the current push for "brain based" learning in other areas of education (2). Understanding how the brain operates allows for an integration of the natural functioning of the brain into an educator's teaching—increasing learning speed, retention, and ultimately intellectual potential and achievement. The literal model of physical education begins with an understanding of the natural movements of the body, which then can be integrated into teaching—improving fitness, physical ability and athletic potential.

The Literal Model Is the Natural Expression of Physical Learning

My godson Michael is learning how to walk.

In the traditional model, his parents would stand him up and let him fall over and over again until he developed the strength to stand on his feet, the ability to balance himself and the coordination to place one foot in front of the other without falling. The thinking here is that in order to learn how to walk, one must practice walking. They would tell him all the rules of the game of walking—what to do and when to do some things and when not to do other things. Stand and fall, stand and fall, the cycle continues without any crawling or rolling or pushing off the floor—he is learning how to walk and so he must walk. After all this, if he does learn to walk, we will hope that his experience was fun enough that he will want to continue to walk for the rest of his life.

In the literal model, Michael teaches himself how to walk by experiencing many different movements in many different situations. He crawls. He pushes himself off the ground. He uses obstacles to pull himself up. He squats to pick something up off the ground. He will bounce up and down, and up and down, and up … .

And when he is ready, his brain puts all these foundational movements together and says, "Ahh, this is how you do it." Because Michael has experienced diverse yet basic movements, he now has the strength to stand, the balance to remain standing and the coordination to put one foot in front of the other. He walks.

We do not teach children how to walk; children teach themselves how to walk using movements they have personally experienced, with occasional guidance from people who have already mastered the skill. Here is the concept of physical constructivism. A constructivist standpoint in the classroom accepts that a learner can only create meaning from information through his or her own prior experiences (9). A consistently implemented literal-model curriculum gives children the wide and deep kinesthetic experiences that are the foundation for future motor learning. The child who effectively learned and performed lunging and jumping many times in many different ways will be able to learn sprint mechanics on the track faster than a child who hasn't. The child who has practiced his or her balance and coordination with overhead squats and handstands will be able to learn change-of-direction drills on the football field faster than a child who hasn't. These varied kinesthetic experiences that help children create meaning in their learning are simply not available to children experiencing the traditional model of physical education. Instead, the same small number of sport-specific movement patterns are hammered again and again in an effort to increase fitness or athletic ability. However, in this process nothing is being added to their physical vocabulary, and no new experiences are being gained that could inform future learning.

CrossFit Nuernberg

Kids who have fun in a physical environment will likely be inclined to be active as they grow up.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Michael used simple, basic movements to build a rich physical experience that allowed him to achieve the complex skill of walking. This use of something basic and known to build up to something complex and unknown is the physical version of Piaget's scaffolding: the body progressively builds on known skills and abilities to create and learn better, more efficient, and more advanced skills and abilities (8). Introducing sport-specific skills to young children before they are ready is ineffective because it is pedagogically incorrect; it assumes a basic level of physical competency that many children simply don't have. Using the literal model as a basis for a physical-education curriculum ensures that skills are being taught at a developmentally appropriate time—increasing safety as well as improving potential.

In order for effective, rigorous and long-lasting physical learning to take place, an educational framework based on the physiological functioning and cognitive learning of children is needed.

GPP as a Framework

The Body in Balance

The goal of the literal model is to improve general physical preparedness (GPP). This is the ability to perform any kind of physical work. In regard to educational practice, GPP is not simply teaching all children to be athletes, but how to use and take care of their bodies in any physical endeavor, athletic or otherwise.

Where a traditional curriculum primarily uses sport- and game-specific skills to elicit physiological change, the GPP curriculum uses the basic, natural movements of the body, often called "functional movements." Functional movements are multi-joint movements that can be described as containing a universal recruitment motor pattern—in other words, they can be found in any kind of physical environment. As stated earlier, sport-specific movements can have transfer over to other sports or aspects of life, but the specificity of training only to throw a curveball exactly 60 feet 6 inches could be seen as having less transfer than learning how to sprint. Sports can encourage extreme specialization to the detriment of overall development.

By using all of the functional movements of the body, a student is able to improve fitness as well as gain neurological skills—balance, coordination, agility and accuracy—while protecting the body against injury. Because functional movements are produced across multiple joints and require the use of many different muscles of the body simultaneously, they inherently provide protective support while at the same time possess the ability to create greater physiological improvement than smaller, single-joint movements (6). With the GPP

CrossFit Kids

The ability to squat will serve these children well in sport and in life.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

approach to physical education, there are intentionally no movement limitations or specializations, drastically reducing risk of overuse injury, even as children become more physically capable by performing at a relatively high intensity level. Developing muscles and joints are strengthened in balance with one another, allowing the body to learn to protect itself by performing movement in the safest and most efficient way possible (5).

If GPP is effectively used as the foundation for our teaching, the educator has the opportunity to give children something incredibly powerful: the physical ability to do more of whatever they want to do or need to do, regardless of circumstance. Not only will increased GPP contribute to athletic potential and achievement on the court or field, but it will also contribute to children's ability to play outside with their friends or physically defend themselves or escape a dangerous situation.

However, in order for the GPP framework to create long-lasting learning, an effective and progressive curriculum is needed.

Three Basic Qualities of a Physical-Education Curriculum

A teacher can have the most well-constructed lesson plan with the best information, but if it is not fun, kids won't participate or be fully engaged.

First, in order to be effective, a physical-education program needs to be fun. The fact that children associate physical movement with fun cannot be overemphasized. A teacher can have the most well-constructed lesson plan with the best information, but if it is not fun, kids won't participate or be fully engaged. Active engagement is the foundation of physical education, and there is no better way to actively engage kids than to convince them something is fun.

CrossFit Nuernberg

For many people, activity ends at the conclusion of gym class, which highlights the failure of the traditional P.E. model.

Second, the curriculum needs to be rigorous. It is not enough for a gym class to only be fun; it needs to give students many different skills that improve their lives, for the rest of their lives, while holding them to high standards of performance.

Third, through the engaging quality of fun and the educational benefits of rigor, a curriculum needs to help create a valuation of good health, fitness and physical activity that continues outside the classroom and into the rest of a child's life.

CrossFit Kids

To understand how CrossFit Kids builds on the literal model of physical education, one needs to first look at the definition of CrossFit methodology: constantly varied functional movements executed at high intensity (6).

Constant variation—In order to achieve the high degree of movement proficiency required in CrossFit Kids, the movement requirements of every class period are different. This ensures that all functional movements of the body are

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Phil Eich

Learning proper mechanics at a young age will create benefits in sport and life.

being expressed in many different contexts and combinations, increasing GPP while helping to prevent the detriments of early specialization. This progressive and intentional diversity of physical movement has been shown to be one of the most effective methods of increasing long-term motor-learning retention (13).

Functional movement—CrossFit uses the most basic movements of the body—squatting, pushing, pulling, etc.—because they provide the most physiological benefits while being inherently safer than other movements (5). Performing a variety of tasks that use many parts of the body in a functional manner will provide more overall fitness than simply performing one arbitrary sport-specific movement 10,000 times to the exclusion of others.

High intensity—Intensity, or hard work, produces results. Greater intensity—whether it is lifting more weight or the same weight faster or simply "doing more of something" within a given period of time—is one of the ultimate goals of CrossFit Kids. The ability to produce more physical effort in a given amount of time is a primary indicator of fitness. Greater intensity, however, is safely and efficiently created when understanding of technique and proper performance of movement mechanics is mastered and repeatable consistently over a long period of time. In CrossFit Kids, until a child is ready, intensity takes a back seat to learning and ingraining good movement. Once a child becomes secure in good technique, the student can start progressing toward greater intensity—leading to a greater increase in fitness.

The eventual progression from mechanics to intensity is an important one. Not only does increased intensity integrate into a child's natural desire to "go faster" or "throw further"—and therefore provide a context for motivation and continued success—but as educators, we also want to teach with the idea that our efforts will produce learning. One of the primary ways learning occurs is through progressive challenge.

At the beginning of CrossFit Kids, physical capacity is developed through the cognitive and psychomotor challenge of learning how to move in new and more efficient ways. Once those challenges are met, physical education continues by learning how to use efficient movement to move faster, execute more repetitions or perform under a heavier load. Going into the gym and "doing some push-ups" without quantitative or qualitative progress is not an education; it's an activity. Working

Phil Eich

With CrossFit Kids, children discover there's a whole world of physical accomplishment outside traditional sports.

toward movement mastery and then higher intensity ensures that children establish a long-term foundational physical education.

Moving in Functional Ways Is Fun

After my godson discovered he could move, he moved. Everywhere. He was constantly moving everywhere and in every way, laughing and smiling the entire time. He wasn't moving because this was a game to be played or a sport to be won, but simply because the act of moving was fun. If he wasn't sleeping, he was moving simply because movement in all its infinite variations gave him happiness. This ability of movement to bring happiness is sometimes referred to as "muscle joy" (16). In the world of children it is called "playing"; in the world of adults it usually (and unfortunately) goes by "relieving stress." Opponents of the GPP approach to physical education will argue that kids won't have fun "working out," and personally, I agree—if the "working out" going on within a class lacks meaning or is not enjoyable.

Fun is already integrated into CrossFit Kids because it makes fitness a game. It creates a fun learning experience by using big, new, constantly varied movements over the entire duration of the class period—all within a success-driven and positively competitive environment. The foundational movements performed are often unfamiliar (even if they are natural and functional), and so the opportunity to do new things is immediately intriguing.

There is no "standing around and waiting for a turn" in CrossFit Kids. Every child is active all the time. For the physically proficient children, this is fun—they can do as much as they want as often as they want. For the less proficient children, this is fun because the pressure is off—the class isn't staring and evaluating their performance. Kids are also met with challenges at their level and so experience the thrill of success every day. It has been this author's experience that kids are likely to cheer a student's first push-up as much as they root for another child to break the classroom push-up record because they realize, regardless of current level, success is fun for everyone.

Fun is already integrated into CrossFit Kids because it makes fitness a game.

Moving in Functional Ways Is Rigorous

Not only is this kind of "working out" fun for kids, but it also consistently prepares them to meet the physical reality of daily life—infinite combinations and variations of different physical movements.

In CrossFit, there is a never-ending supply of new skills to be learned or old skills to be practiced. For example, a child can move from "roll-up" push-ups to full push-ups to wall-assisted handstand push-ups to freestanding handstand push-ups. Once the squat is mastered, one can develop the ability to do more squats in shorter amounts of time. This combination of learning increasingly more complex movements and the necessity of practicing already-learned skills ensures a rigorous and progressive education.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

The sport-based unit structure of the traditional model does not advance in this way—activities are generally not progressive, just different.

Moving in Functional Ways Has Lifelong Applications

The common element that students share is that, for the rest of their lives, they will have a body. CrossFit educates the students on how to use that body while improving the body's ability to perform, regardless of environment or circumstance. The sport- and game-based curriculum teaches skills and hopes there is a carryover to the rest of a child's life; CrossFit teaches skills and knows there is a carryover.

The CrossFit Kids Curriculum

The typical CrossFit Kids class is divided up into four periods—warm-up, skill, Workout of the Day (WOD), and game.

Whatever activity is used for the warm-up, it is fun and energetic, with every child being physically engaged. This "attention-getter" part of the lesson establishes excitement and momentum for the rest of the class period.

The skill portion of the class is where children learn a new movement or review, refine and practice movements already learned. This portion of the class contains the most direct instruction, but kids remain active and involved, performing the skill as the teacher observes and coaches the mechanics of each child.

In the WOD, children put their movement learning and fitness to the test. A workout might look something like this:

> As many rounds as possible in 5 minutes of: 10 air squats, 5 push-ups, 3 broad jumps right into sprinting the length of the gym and back

Notice that the workout is short, creating the opportunity for high-intensity effort that produces results, as well as helping to maintain the attention and participation of the class. In the eyes of the child, this is just long enough to "stay fun," is competitive enough to produce intensity, and contains enough elements to not be boring while remaining easy to understand. In eyes of the teacher, all children are learning to perform necessary physical skills while giving 5 minutes of their very best effort, all while having fun.

CrossFit Utah Valley

In a CrossFit Kids class, skills are taught while the entire group is engaged. This is followed by a relatively short and very fun workout that tests what they have learned.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

One of the most beneficial attributes of a workout like this is that it automatically scales relative to each child's ability level while still remaining challenging. The child with a high level of fitness and the child with a low level of fitness will both be working hard relative to ability but will simply end up with different scores at the end. The workout is also time for a teacher to assess movement mastery—if a child is unable to maintain technique at a high intensity, more work needs to be done during the skill period. If a child is able to maintain technique at high intensity, the teacher can begin to focus the student on technique refinement and advancing fitness.

Although the children have been playing in various ways up to this point, the final period is the first that is specifically referred to as a "game." This is a CrossFit Kids game or a traditional game with a CrossFit twist. For example, in dodgeball, once a player is out, he or she typically stays out until the next game. In CrossFit Kids dodgeball, the player who is "out" can get back into the game by performing some kind of physical task—10 air squats, 10 push-ups, etc. This further emphasizes the fact that physical activity and hard work are important, not winning or "getting out."

CrossFit Kids Is Effective

The CrossFit Kids curriculum is effective because it creates a physical learning environment that builds on the idea that all children have differing abilities and need to be challenged at their individual point of development in order for effective learning to take place. This differentiated instruction allows a child to continually and efficiently progress, minimizing the risk of frustration or stagnation. Every skill, every movement, every workout and every game can be scaled to a child's ability (made easier or harder) so he or she is challenged by something difficult but not discouraged by something impossible. This not only allows for efficient and effective teaching and learning but also increases students' desire to participate and challenge themselves.

CrossFit Kids uses the natural process of motor development to increase learning effectiveness and efficiency. Instead of confining a child's development with rules and movement limitations of sports while running the risk of contributing to the detrimental effects of overspecialization, CrossFit Kids uses a child's natural propensity for constantly varied movement by using constantly varied movement.

This curriculum provides the direct teaching and assessment of necessary physical skills and is able to monitor progress by providing quantifiable data: movement improves, workout times decrease, number of reps increase, new movements are able to be performed. Where improvement in the traditional physical education classroom is largely subjective, CrossFit lays the groundwork for success, achieves success and is able to prove success is happening. Children are able to perform more advanced movements more times and faster.

To a child, these successes are more than just a good grade, a pat on the back or a participation trophy; they are tangible evidence of accomplishment. The child who is unable to do a full push-up performs one full rep for the first time: success. The child who has done 10 full push-ups does 11: success. Finishing a hard workout: success. Children cheering on the final classmate to finish: success. This feeling of success while working hard and learning something of value is incredibly motivating to a child, and it is perhaps the best educational tool that CrossFit Kids offers.

Kids, like adults, want to do things well. CrossFit Kids gives children the best chance to be able to do things well because it equips them with foundational physical tools that can be applied to any future physical endeavor. It provides a pedagogically sound and effective physical education curriculum that is fun and rigorous and provides lifelong benefits to children.

Improving Lives

As teachers, we have an incredible privilege and responsibility to give the best of what we know to our students. CrossFit Kids provides teachers with the concepts and the curriculum necessary to improve the physical well-being of people from childhood through adulthood in meaningful, life-affirming ways. Where there is always a need for sports and games, using CrossFit to fulfill the literal model of physical education allows the teacher to contribute to the empowerment of every single student's self-determination. Children can begin to live physical lives of choice unconstrained by the restrictions of poor health, unnecessary injury or lack of physical skill.

References

1. Brooks T. Injury rates in early sport specialization athletes. International Youth Conditioning Association. Sept. 1, 2011. Available at http://iyca.org/injury-rates-in-early-sport-specialization-athletes/. Accessed March 6, 2013.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

2. Caine G. Brain/mind principles of natural learning. Feb. 13, 2013. Available at http://www.cainelearning.com/RESEARCHFOUNDATIONS/Principles-Expanded.html. Accessed March 6, 2013.

3. Committee on Sports Medicine and Fitness. Intensive training and sports specialization in young athletes. *Pediatrics* 106(1): 154-157, July 2000. Available at http://pediatrics.aappublications.org/content/106/1/154.full. Accessed March 6, 2013.

4. Farrey T. *Game On: How the Pressure to Win at All Costs Endangers Youth Sports and What Parents Can Do About It*. N.Y.: ESPN Books, 2008. p. 93.

5. Glassman G. Foundations. *CrossFit Journal*. April 2002. Available at http://library.crossfit.com/free/pdf/Foundations.pdf. Accessed March 6, 2013.

6. Glassman G. What Is Fitness? *CrossFit Journal*. Oct. 1, 2002. Available at http://library.crossfit.com/free/pdf/CFJ_WIFTrial_Feb2012.pdf. Accessed March 6, 2013.

7. Ham S, Kruger J, and Tudor-Locke C. Participation by U.S. adults in sports, exercise, and recreational physical activities. *Journal of Physical Activity and Health*, 6(1): 6-14, January 2009.

8. Hartman DH. Instructional scaffolding: A teaching strategy. November 2002. Available at http://condor.admin.ccny.cuny.edu/~group4/Cano/Cano%20Paper.doc. Accessed March 6, 2013.

9. Hein G. Constructivist learning theory. 1996. Available at http://www.exploratorium.edu/ifi/resources/constructivistlearning.html. Accessed March 6, 2013.

10. John D and Tsatsouline P. *Easy Strength: How to Get a Lot Stronger than Your Competition—and Dominate in Your Sport*. N.Y.: Dragon Door Publications, 2011.

11. Medical News Today. Early sports specialization not a good idea, experts say. Nov. 6, 2006. Available at http://www.medicalnewstoday.com/releases/55925.php. Accessed March 6, 2013.

12. PE4Life. Shocking statistics of the decline in kids' health and activity! Oct. 27, 2009. Available at http://pe4lifeblog.blogspot.com/2009/10/kids-health-facts.html. Accessed March 6, 2013.

13. Schmidt RA and Wrisberg CA. *Motor Learning and Performance*. Champaign, Ill.: Human Kinetics, 2000. Pp. 257-263.

14. STOP Sports Injuries. Available at http://www.stopsportsinjuries.org/. Accessed March 6, 2013.

15. Woods RB. A closer look at some trends in youth sports participation. Excerpt from *Social Issues in Sport* (2nd ed.). Champaign, Ill.: Human Kinetics, 2011. Available at http://www.humankinetics.com/excerpts/excerpts/a-closer-look-at-some-trends-in-youth-sport-participation. Accessed March 6, 2013.

Further Reading

1. American College of Sports Medicine. Current comment from the American College of Sports Medicine: The prevention of sport injuries of children and adolescents. *Medicine and Science in Sport and Exercise* 25(8 suppl): 1-7, 1993.

2. Chomitz VR, Slining MM, McGowan RT, Mitchel, SE, Dawson GF, and Hacker KA. Is there a relationship between physical fitness and academic achievement? Positive results from public school children in Northeastern United States. *Journal of School Health* 79(1): 30-37, 2009.

3. Coe DP, Pivarnik JM, Womack CJ, Reeves MJ, and Malina RM. Effect of physical education and activity levels on academic achievement in children. *Medicine and Science in Sports and Exercise* 38: 1515-1519, 2006.

4. Faigenbaum AD, Kraemer WJ, Blimkie CJR, Cameron JR, Jeffreys I, Micheli LJ, Nitka M, and Rowland TW. Youth resistance training: Updated position statement paper from the National Strength and Conditioning Association. *Strength and Conditioning Journal* 23(Supplement 5): S60-S79, 2009.

5. Johnson SB and Jones VC. Adolescent development and risk of injury: Using developmental science to improve interventions. *Injury Prevention* 17: 50-54, 2011.

6. Valovich McLeod TC, Decoster LC, Loud, KJ, Micheli LJ, Parker, JT, Sandrey MA, and White C. The National Athletic Trainers' Association position statement: Prevention of pediatric overuse injuries. *Journal of Athletic Training* 46(2): 206-220, 2011.

About the Author

Phil Eich is a fifth- and sixth-grade teacher in Bay City, Mich., and holds multiple CrossFit certificates. He is a member of the CrossFit Kids Educator Committee.

THE CrossFit JOURNAL

Don't Neglect Your Neck

Bill Starr recommends a host of exercises to build a strong upper back and neck.

By Bill Starr **May 2013**

Mike Warkentin/CrossFit Journal

When I review the programs that are sent to me, I quickly check to see if the athletes included any specific exercises for the neck. They never do. It's as if people assume their necks are getting sufficient work from all the other movements in their routines.

In the case of Olympic lifters and those who include some explosive lifts such as power cleans and power snatches or high pulls and shrugs, they really don't need to do much more for their necks. But most of the letters I receive from older lifters show that they are not doing any dynamic movements, nor are they providing for their necks in any way. This is a mistake and needs to be corrected.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

For those athletes who participate in contact sports, such as hockey, lacrosse, football and soccer, having a strong neck is an absolute must. It can mean the difference between getting a stinger in the neck after a head-on-head collision or being carried off the field and into the emergency room. Injuries to the neck are scary, and one of my greatest fears when I was strength coaching at the University of Maryland, the University of Hawaii and at Johns Hopkins was that one of my athletes would sustain some sort of neck injury. None ever did, and for that I was thankful—thankful that they did what I told them to do in the weight room and thankful that a bit of luck was on their side.

The sad truth of the matter is that even if an athlete works his neck and upper back diligently, he is going to get injured if he gets hit just right. Yet a strong neck is still an asset because it will lessen the severity of the injury. I've talked to a great many people who told me in no uncertain terms that weight training saved them from being badly hurt during a car wreck. Whiplash put the muscles of their necks under a great test, and they walked away from the twisted metal. Sure, their necks were sore, but it was nothing that a few aspirin tablets couldn't handle.

And, of course, a few sports require extra-strong necks for the athletes to be successful. Wrestling is the one that pops in my mind. I learned how to strengthen my neck when I was a member of the Wichita Falls Y wrestling team. I was also competing in Olympic lifts at the time, so the combination of pulling heavy weights and doing the neck exercises on the mats helped me build a strong neck. And the stronger my neck got, the more all the other exercises in my program improved—even those for my shoulders and chest. I found that when I scrunched my traps up into my neck and got everything in that package extremely tight, I could overhead press, incline, dip and flat-bench more weight than when I allowed my neck and upper body to relax.

All the programs I give to athletes, both male and female, young and old, are based on what I learned at the Wichita Falls Y a very long time ago. I know the programs work well from personal experience and from observing the many athletes I have dealt with over the years.

However, there is a group of older athletes who can no longer do any dynamic movements. Nor can they utilize many of the specific neck exercises younger athletes thrive on. Yet the older athlete needs a strong neck more than his younger counterparts.

Recently, I have run into a number of men I have trained with at one time or another in Harford County. They are all in the middle 50s to early 60s, and they all tell me the same thing: their necks ache them something terrible and in some cases prevent a decent night's sleep. A couple consulted medical doctors and were advised to have surgery to relieve the pain.

In this article, I'll deal with two separate groups of strength athletes: those who can still do some explosive movements and those who cannot.

Pull It High

Building a stronger neck starts with making all the upper-body muscles more powerful. It's simply impossible to improve strength in the neck if the traps are weak. There are quite a few muscles to consider when attempting to strengthen the upper back: minor and major rhomboids, infraspinatus, teres major, serratus posterior, superior latissimus dorsi, deltoids, and, of course, the main player—trapezius. The latter muscle is very large and made up of four layers. It's shaped like a trapezoid, hence its name. It originates at the back of the skull, approximately on a line with the top of the ears, then swings out and down to form a V shape where it connects with the deltoids and finally inserts at the last thoracic vertebrae in the middle of the back.

Making sure all the muscles of the upper back get worked regularly and with heavy weights helps secure the upper spine and makes the entire shoulder girdle more stable.

Making sure all the muscles of the upper back get worked regularly and with heavy weights helps secure the upper spine and makes the entire shoulder girdle more stable, which means it keeps the joints in the proper position. Those who get enamored with flat bench and at the same time ignore their upper backs end up with a humped-over posture.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Mike Warkentin/CrossFit Journal

To target the neck and upper back, Bill Starr recommends you attempt to pull the bar as high as possible in every clean or snatch high pull. Full extension (Frame 1) is key.

This issue is often seen in bodybuilders and powerlifters who are only interested in improving their arms and chest and only do deadlifts rather than any form of high pulling. This creates disproportionate strength in the shoulder joints and will affect all the upper-body movements. Unchecked, it will eventually lead to severe pain in the shoulders, usually in the rear-deltoid range. This disparity in strength needs to be corrected before it becomes a serious problem.

There are a number of excellent exercises an athlete can do to strengthen his upper back and at the same time make his neck stronger: power cleans, power snatches, clean- and snatch-grip high pulls, and shrugs. Naturally, full cleans and snatches fit the bill as well. For those who are still actively taking part in a competitive sport, the more dynamic the movement, the better. That means including power cleans, high pulls and shrugs in the weekly routine. For those who are past that stage but are still able to get away with an explosive lift, I suggest both clean- and snatch-grip high pulls and dynamic shrugs.

When athletes get into their 40s or early 50s, they often have difficulty doing power cleans. This is usually due to some problem in one shoulder or the other, or in some cases it's their elbows that complain when the bar is racked across the frontal deltoids. In this case, try power snatches. They are especially good for enhancing strength in the upper back due to the fact that the bar has to be pulled considerably higher than in any other pulling exercise. And the rack is much easier on the shoulders and elbows because the athlete is simply locking out his arms at the finish, which is usually much less stressful to the shoulder girdle. The only downside to power snatches is that less weight is used than with the power clean.

That's where high pulls come in nicely. Once you have mastered good form on either the power clean or power snatch, high pulls are easy to learn. They are extremely beneficial to making the upper back strong because they overload those groups involved. The hardest part of learning correct technique on the two forms of high pulls is the transition from the deadlift phase to the high-pull phase. It has to be done smoothly with no hitching whatsoever. While high pulls are really no more than a deadlift followed by a shrug, making that transition takes a great deal of practice. In fact, this is one of the hardest lifts to learn in strength training.

The best way to work high pulls into your routine is to do either power cleans or power snatches first, then move right into the high pulls. With the longer pulling motions and the relatively lighter weights used on the power movements, you can step right in and do the high pulls much more easily.

> While high pulls are really no more than a deadlift followed by a shrug, making that transition takes a great deal of practice.

Use straps on the high pulls. You may not need them with light weights, but once you start piling on the plates, you will. Your eventual goal should be to handle 75 lb. more in the clean high pull than you're able to power clean and 50 lb. more in the snatch high pull than you can power snatch. Naturally, you're not going to be able to do this right away because it takes considerable practice to master the high pulls.

The key to making the high pulls useful is to always seek more and more height. You can never high pull a bar too high. Fully extend on every rep, and this will activate more muscles in your upper back and shoulders than if you merely nudge it upward. Even with your lighter, warm-up poundages, pull the bar just as high as you possibly can. For the first couple of sets, you may find the bar soaring up over your head. Excellent! That's exactly what you want. When you really extend high on your toes with your elbows up and out, you'll feel it in your neck and traps the following day. That's when you know you're doing the pulls correctly.

Even if you can't power clean, do clean high pulls. Doing several different exercises is much more productive than choosing just one because they each attack the upper back and shoulders in a slightly different manner. For example, the snatch-grip high pulls hit the wider part of the traps and the lats in a different fashion than the clean-grip high pulls do. I suggest alternating them every other time you do them.

Power cleans and power snatches are best done in sets of 5 for 5 reps, but for those having trouble getting the feel of power snatches, I lower the reps to 3. High pulls, other than for the lighter warm-ups sets, should be done in triples as well. The lower reps will allow you to concentrate more fully on the smaller form points. What you do not want to do is pick up bad habits while learning how to do either power movement or the high pulls. Habits are often tough to get rid of, so it's better not to pick them up in the first place.

In the beginning, do 5 sets of power cleans or power snatches, and follow with just 3 sets of high pulls. I've had some lifters who like to follow power cleans with wide-grip or snatch high pulls and place clean-grip high pulls behind power snatches. Whatever fits your mood is fine, just be sure to use correct technique and work them hard.

Shrug Big Weight

Once you have mastered the form on power cleans and clean high pulls, shrugs are a snap. It's exactly the same line of pull, and you still want to pull the bar just as high as you can on every rep. The biggest difference is the amount of weight on the bar. For shrugs to have the desired effect, you must really load up the bar. The goal I set for my male athletes is for them to be able to give a jolt to 495 for 5 reps on their final set of shrugs. That's five 45-lb. plates on each end of the bar plus the bar itself. I tell them this is well within their reach at the end of the off-season program, which lasts approximately four months. While some beginners are skeptical, I point out that the only ones who failed to reach that goal were those who had some sort of injury that kept them from being able to do heavy shrugs.

One of the things strength athletes learn rapidly is that the traps respond to direct work very quickly. In just one off-season program, I've had athletes go from having such poor upper-back development that it hurt them to hold the bar on their upper backs when they squatted to sprouting mounds that made them look like Brahma bulls.

But to get such an impressive set of traps, you have to do as I said with the high pulls: extend the weight upward just as high as you can. I also have my athletes use clean and snatch grips for these, and, of course, you will need straps so you won't have to be concerned about holding onto the bar when the weights get really, really heavy.

Because shrugs are done inside the rack, you may end up hitting the crossbar of the rack on your first couple of sets. I encourage this because it sets the pattern for all the

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

reps that come later. When three, four, and five plates have been added, the bar will go nowhere near that high, but if you're still trying to gain more and more height on every rep, those muscles and attachments doing the work are going to get much stronger than if you merely give it a half-hearted effort.

If you fully apply yourself on the shrugs, your traps should get sore after every workout. I mean every single time you do them. When I was still competing in Olympic lifting and powerlifting, and later on when I just trained for strength, I did heavy, dynamic shrugs every Friday. This covered right about 40 years, and my traps got sore every single time. Sore traps are the best feeling in the world to me. In truth, getting any muscle group sore makes me happy. Strange maybe, but it works for me.

In truth, getting any muscle group sore makes me happy. Strange maybe, but it works for me.

These movements will greatly increase both size and strength in your upper back. They form the foundation for further development in the all-important neck. Without that base, progress will come much more slowly in the neck department, so spend some time getting those upper-back shoulder muscles just as strong as you can. That will allow you to really attack the neck right away.

Targeting the Neck

Here are some exercises I recommend for strengthening the neck. No. 1 on my list is the wrestler's bridge, so named because all wrestlers do a great deal of them. Without a strong neck, a wrestler is at a great disadvantage, so bridges are a part of every workout. These can be performed on the front and the back. If you haven't done any specific neck work for a long time, ease into these.

Place a thick towel or pillow on the floor, and lie on your back with your head on the cushion. Arch up so that your weight is on your heels and the back of your head. In the beginning, you can keep your hands on the floor to help with your balance and take some pressure off your

Mike Warkentin/CrossFit Journal

Mike Warkentin/CrossFit Journal

As in high pulls, full extension is necessary in the shrug. In shrugs, the bar will not go as high because the loads are much greater.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

Mike Warkentin/CrossFit Journal

To scale this challenging movement, start with the knees on the ground rather than just the toes.

Mike Warkentin/CrossFit Journal

If the wrestler's bridge is too much for your neck at first, start with your hands on the ground for support.

head until you get used to the rocking back and forth movement. Try to increase your range of motion a bit more each time you do them.

The frontal bridge is done with your forehead on the cushion and your toes on the ground. Again, if you haven't had any neck work in your program for a while, start out easy on your knees rather than on your toes. Rock back and forth until you feel your neck muscles begin to complain. As you're only going to be able to do perhaps a dozen or so the first few times you do either of these exercises, do several sets to get in a sufficient amount of work. Many of my athletes preferred to do these apart from their workouts, later on at night and on their non-lifting days. The good thing about these movements is that you can do them anywhere and without any assistance.

> Without a strong neck, a wrestler is at a great disadvantage, so bridges are a part of every workout.

Steadily increase your reps. As you progress to doing 75 to 100, take your hands off the floor for the rear bridges and clasp your hands on your midsection. Likewise, remove your hands off the floor for the frontal bridges in order to put more pressure on your neck.

Another specific neck exercise that I favor does need someone to help you perform it. It's basically dynamic tension with a training mate providing the resistance. Place a folded towel on your forehead and have someone

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

push down on the towel as you resist the pressure placed on you. Go easy at first or you will end up dinging your neck. When your teammate has pushed your neck down as far as it can go, he needs to release most of the pressure so that you can bring your neck back to the starting position—but not all the pressure; just enough so that you can bring your head back. You should have to work hard to do that. At the finish, your chin will be touching your chest. Do as many reps as you can handle, then roll over on your belly and do the same movement while facing the floor.

As your training mate attempts to push your head down you will, in turn, do your damndest to prevent him from moving your head at all. But unless you're very advanced in the neck-muscle category, he will always win. When he has pushed you down to your end range of motion, he will let up just enough to that you can extend your head up and back again.

The best thing about these is that you can also work the sides of your neck, which really can't be done with wrestler's bridges. Same deal: lie on your side with a towel above your ear, and have your training mate apply pressure while you resist him. After you've done front and back and both sides, you will have worked all the muscles of your neck very thoroughly.

For all these exercises, use caution and stay within natural ranges of motion. Your partner should not be overly aggressive with the towel. Use common sense at all times.

A neck harness is also an excellent way to strengthen all the neck muscles. They used to be popular with bodybuilders, who knew the importance of having muscular necks. Harnesses can be purchased in stores that specialize in weight equipment, and it's easy to figure out how to work all the parts of your neck with a harness. It's also a great deal less stressful than bridges or the dynamic tension movements with a partner. In fact, I'm trying to track one down for my personal use.

Mike Warkentin/CrossFit Journal

This exercise is meant to be done under control, and athletes should not exceed natural ranges of motion.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

The first time I saw this next piece of equipment, I thought the guy who had devised it was a bit loopy. But after watching him use it and thinking about how it worked, I changed my opinion of him and understood that he had come up with a simple way to make his neck stronger. His name was Bill Barnholth, and he was related to the legendary Barnholth brothers of Akron, Ohio: Larry, Lewis and Claude. They were the founders of the American College of Modern Weightlifting, which produced the great George brothers—Pete, Jim and George.

On the top of a football helmet, Bill had inserted a dumbbell handle. Onto this he put 2.5-, 5- and 10-lb. plates, then secured them with a dumbbell collar. Then he would sit on a bench, grasp its side to steady himself and proceed to work all four sides of his neck by turning the weighted helmet front and back and side to side. The simplicity and effectiveness of the device was pure genius, and there's no reason why you can't rig one up yourself and put it to use.

The Neck and the Older Athlete

Now I want to turn to the older athletes who are not able to do the exercises I recommended because dynamic movements irritate their joints way too much.

However, you can still shrug, only the reps have to be done slowly, not explosively. I suggest starting out with dumbbells. Twenty pounders will be heavy enough. Two sets of 20 for starters. Elevate your traps slowly and squeeze them tightly as the end of each rep. At the end of the set, you should be able to feel it in your neck and traps, and if you worked them diligently enough, those muscles will be a bit sore the following day. If you have a wide selection of dumbbells to choose from, slowly move up to the 25 pounders, then 30s, 35s and so on. Should you only have a couple of sets of dumbbells at your disposal, run the reps up, way up. When you can do two sets of 100 with your heaviest dumbbells, switch over to using a bar and add plates as you get stronger. But stay with the high reps, all done deliberately and with a contraction at the finish of each rep.

Mike Warkentin/CrossFit Journal

The key to the shrug is a very deliberate squeeze of the traps at the top of the rep.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

These, you will discover, are much harder than conventional shrugs, because they require more time and more concentration because of the high number of reps. But they will get the job done if you put enough energy into the exercise.

I have a friend who is a bit older than I am, and he started out using 10-lb. dumbbells for 20 reps for his shrugs, and the last time I talked to him he was shrugging 155 for two sets of 150 twice a week. He also added to his trap work by doing a shrug after each rep when he did deadlifts. Another older athlete I correspond with cannot squat with a bar because his shoulders no longer allow it, so he uses dumbbells, and at the end of each squat he does a shrug.

Do something specific every day for your neck.

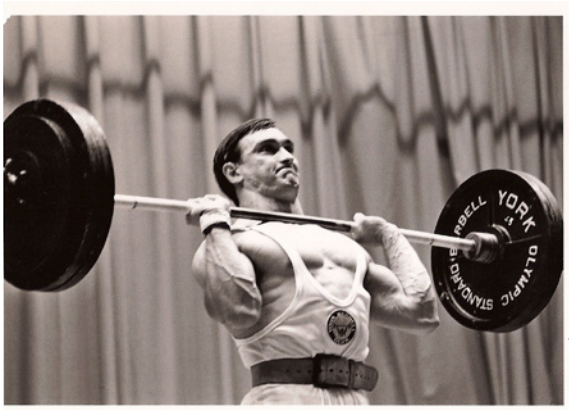
Older athletes can benefit from dynamic-tension exercises as well. They don't need any assistance because they can apply the pressure themselves. That's really the case for all dynamic-tension movements. To work the front neck muscles, place a hand, or both hands, on your forehead and resist your head from moving forward and downward. Squeeze against this resistance until you reach the end range of motion, then fight against it again as you return your head to the starting position. The same thing applies for the sides and back of your neck. You can do these while watching TV. They only take four or five minutes to do, and once you learn to really lean into them, they will produce the desired results.

I also encourage older athletes to try and do some bridges. Almost everyone can do frontal bridges if he stays on his knees.

Do something specific every day for your neck. If all you can do are dynamic-tension movements, work them consistently and slowly increase the reps. Start out conservatively on all the exercises for your upper back and neck for two reasons: it will help you find out if an exercise irritates your neck more than it benefits it, or perhaps the shrugs, even when done with a light weight and very deliberately, still hurt your shoulders. And when you start out with a low rep count, you have someplace to go, because in the final analysis, it doesn't matter where you begin; it's where you finish.

Both younger and older athletes need strong necks. Start including some auxiliary movements in your routine for this critical body part and you just may end up saving your own life.

✦



Jody Forster

About the Author

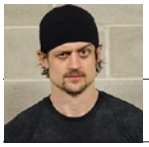
Bill Starr coached at the 1968 Olympics in Mexico City, the 1970 Olympic Weightlifting World Championship in Columbus, Ohio, and the 1975 World Powerlifting Championships in Birmingham, England. He was selected as head coach of the 1969 team that competed in the Tournament of Americas in Mayaguez, Puerto Rico, where the United States won the team title, making him the first active lifter to be head coach of an international Olympic weightlifting team. Starr is the author of the books ***The Strongest Shall Survive: Strength Training for Football*** *and* ***Defying Gravity****, which can be found at The Aasgaard Company Bookstore.*

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

THE CrossFit JOURNAL

Weak Behavior: One-Upping

Mike Warkentin advises you to find your own limit in your next workout.



Uncommon Sense

By Mike Warkentin Managing Editor **May 2013**

All Photos: Mike Warkentin/CrossFit Journal

Ever watch an auction and want to choke the guy who continually adds a buck to the top bid?

You know the guy. He's the same one who ruins office pools with the ultra-clever "and one dollar" bracketing strategy learned from contestants on *The Price Is Right*.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

He's also the guy who ruins any poker game without a minimum raise by forcing everyone to call dumbass nuisance raises.

That guy can be found in a lot of CrossFit gyms, too. Let's call him the one-upper.

In the clever article Clock Whores, Doug Chapman, the owner of CrossFit Ann Arbor/Hyperfit USA, wrote about those who care nothing for integrity or fitness but desire only to have the best time of the day by any means necessary. They'd jump over a bleeding family member to get that time, and they'd count the jump as two reps if a trainer wasn't watching.

One-uppers are a lot like clock whores; they'll definitely sacrifice integrity at times, but one-uppers don't want to win big. They just want to win by a pound or a second, and their whole workout plan involves strategically gaming WODs to worm their way to the best time on the whiteboard.

For example, one-upping involves moving the rower underneath the pull-up bar to shave a second by dropping right into the seat. It involves hiding change plates inside full-size bumpers to obscure the true load. Or it involves fractional plates or some complete bullshit stacking of collars for a snatch of "200 plus 4 collars."

Unless you're using a pair of competition Oly collars that weigh 5 kg, the fucking collars don't count. Let us be clear about that right now.

But this sort of nonsense is the one-upper's stock in trade. He'll show up late in the evening to see what's on the leaderboard, and if the best load is 200, you can bet you're going to see an attempt at 201 or—if you're lucky—205. Sometimes that attempt is warranted, and other times it's foolishly aggressive and should be vetoed by the coach on duty.

The one-upper also avoids classes in which he'll have to go head to head with others in workouts he thinks he can't win, or he finds some way to modify the workout to avoid

When creative equipment placement trumps effort, you are probably dealing with a one-upper.

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com

direct competition. I'd guess that 25 percent of all heavy-Fran instances involve scaling up to avoid a straight-up loss. Wearing a weight vest at questionable times is also the mark of a one-upper.

In some cases, there's nothing wrong with one-upping. It's how you win the gold medal in weightlifting at the Olympics, and the athlete at the top of the podium is often the best one-upper of the competition, especially if the margin of victory is a slim 1 kilo. In competitions where a second can decide who goes to the CrossFit Games, shave that second and one-up your rival. You'd be dumb not to. But this sort of pathological behavior in training and regular WODs is bad par.

Imagine the current best time in a five-round workout is 10 minutes. You catch your athlete taking calculated rest and pacing himself through five 1:59 rounds for a time juuust under the best of the day, then bragging he "isn't even tired." Again, if Jason Khalipa needs a particular score in the final heat to win the CrossFit Games, the California Bear might want to get out a calculator and a lap timer. But if you're always shaving seconds in training, you need a sharp reminder from time to time.

That reminder usually comes when a one-upper one-ups the wrong athlete, and suddenly that shit-hot time a single second below the previous best gets steamrolled by some machine who doesn't even look at the clock because he's too busy dismantling the workout while chewing on kettlebells, laughing like a pirate and generally dominating the landscape.

Here's the deal with constant one-upping: it does nothing for you in the long run unless you're working to your absolute limit. If you are, then the whiteboard is being used as intended. You're using the times posted there as information and motivation, and then you're doing up your chinstrap and discovering what you can really do with the workout. If your absolute best happens to be a single rep above the best score, that's not really one-upping.

But if you're playing games for the best scores on a daily basis, one-upping actually holds you back because you never push yourself to your limit. You push to someone else's limit and then add a pound, like the auction asshole described above. That's ultimately weak behavior unworthy of a CrossFit box.

Why not find your limit? Competition drives us, and people will indeed die for points, but don't be satisfied with the best time on the whiteboard if it isn't your best effort.

Hiding change plates and adding collars for "more weight" are but two habits of the one-upper.

Take off the diaper and dig in. Forget the whiteboard and go head to head with yourself. Decide that you're going to push until the tank is empty and then see what the clock says. Choose to pull the heaviest deadlift you can, scrawl the digits on the board and let the plates fall where they may. Show up first thing in the morning and put up a boss time that sits atop the board like a dare. If you think you're capable, resolve to blow the top time out of the water by 2 minutes, not 2 seconds.

The whiteboard is one of CrossFit's most brilliant tools, but try not to be a tool when using the whiteboard.

✦

About the Author

Mike Warkentin is the managing editor of the ***CrossFit Journal*** *and the founder of CrossFit 204.*

Subscription info at http://journal.crossfit.com
Feedback to feedback@crossfit.com
Visit CrossFit.com