THE
CrossFit JOURNAL

October 2015

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THE CrossFit JOURNAL

SCALING CROSSFIT WORKOUTS

BY JEREMY GORDON, CF-L4

Jeremy Gordon shares scaling strategies to help coaches ensure their athletes are getting exactly what they need from each session.

Mike Warkentin/CrossFit Journal

Great coaches program workouts to target a specific adaptation, and proper scaling ensures all athletes receive the same stimulus despite individual variations in mobility, experience, skill and so on.

Linda is one of the few benchmark workouts with a form of scaling built in: Athletes use their body weight to determine the loads for deadlifts, bench presses and cleans.

"Ahead of efficacy is safety." —Greg Glassman, CrossFit Inc. Founder and CEO

Safely scaling workouts for a wide range of athletes without sacrificing attention to non-scaled athletes—it's an essential CrossFit coaching skill. Effective scaling at an affiliate demands an understanding of CrossFit programming theory, awareness of your athletes' capabilities and limitations, and quick application of many possible scaling methods.

It's also important to understand why we scale CrossFit workouts: CrossFit workouts are scaled to preserve the intended stimuli despite athlete limitations such as experience, injury, illness or range of motion.

A properly scaled workout safely maximizes relative intensity (load, speed, range of motion) to continue developing increased work capacity despite limitations. A long-term goal of scaling is creating the ability to perform workouts "as prescribed."

Preserving Stimuli

A programmer may have many intended stimuli at the macro and micro level. To simplify for everyday affiliate application (training for general health and fitness), we'll narrow it to three primary stimuli.

1. Time Domain (Desired Metabolic Pathway)

The duration of the workout (combined with athlete training level) determines the primary metabolic pathways trained. In general, longer workouts demand more time in the aerobic pathway. Shorter challenges require more time in the ATP/CP and glycolytic pathways. (For a review of the primary metabolic pathways, see the October 2002 CrossFit Journal article "What Is Fitness?"). This is, however, a nuanced consideration. For example, heavy loads in volume tend to slow output, creating a mix of aerobic and ATP/CP training and reducing time spent in the glycolytic pathway.

Consider this workout:

21-15-9 reps of:
Deadlifts 355/235 lb.
Rowing for calories

While the shorter-duration row may push athletes into the glycolytic pathway, emphasis will likely shift to the ATP/CP and aerobic pathways as the heavy deadlifts significantly slow the output.

When considering how to scale this workout, strive to preserve the original intent: ATP/CP and aerobic training via heavier loading. Therefore, don't scale load to the point that an athlete works so quickly she remains primarily in the glycolytic pathway. One method for accomplishing this goal is to post the load as "355/235 lb. or 80-85 percent of 1-rep max."

Noting the duration of effort for a task is a simple way to assess the effectiveness of scaling for metabolic pathway. For an experienced affiliate-level female athlete, 21 reps at 235 lb. is approximately a 75-100-second effort. If a scaled athlete finishes the set of 21 deadlifts in 35 seconds, she is likely lifting too light. We'll expand on this concept later in the article.

Let's look at another example:

21-15-9 reps of:
Handstand push-ups
Rowing for calories

For this workout, we'd expect experienced athletes (defined later in this article) to work fast, spending the majority of time in the glycolytic pathway. If an athlete requires 1 minute of rest between every handstand push-up due to ability, then doing the workout as prescribed will not meet the intended metabolic stimulus. There is something to be said for a less-experienced athlete's accumulating 45 handstand push-ups from a training standpoint, but doing so defeats the intended metabolic stimulus of this particular workout, so we assign a handstand-push-up scale that allows athletes to move quickly—at a pace that keeps them mostly in the glycolytic pathway. This doesn't mean they'll finish at the same time as an experienced athlete, but they won't

be doing repeated handstand-push-up 1-rep-max efforts over the course of an hour. Save that for skill-development sessions.

Once in a while, and with safety as a caveat, it is appropriate to allow an athlete to work through a difficult movement or challenging loading during a workout, but generally the original intention of the workout should be matched.

Errors in scaling time domain are quickly evident. In the deadlift workout listed above, if the majority of your class spends 6 minutes on the set of 21 but your scaled athletes finish in 90 seconds, then you've likely made a scaling error. Besides causing athletes to miss the desired training stimulus, this scaling error can affect class cohesion and an athlete's sense of belonging. Ideally, we'd like to keep an entire class working together without creating significant outliers (i.e., someone who finishes in 3 minutes when everyone else works for 20 minutes, or vice versa).

On weightlifting days, time domain and metabolic pathway are expressed in rep scheme and relative loading. If the programmed workout is a 20-rep-max back squat and you scale an injured athlete to strict press, you still want a higher-volume lift, such as a 10-rep max instead of a 1-rep max.

A caveat: For less experienced athletes, scaling to an increased rep scheme (on weightlifting days, not in general) can reduce risk by forcing lower loads. This also provides more coaching opportunities. For example, when a 1-rep-max overhead squat is programmed, it's appropriate to have a CrossFit athlete with one month of experience do sets of 5 reps at submaximal loading.

A helpful scaling tool for managing time domain and metabolic pathways is forecasting a workout-completion window based on the programmed movements, reps and loads. This window is a time (for task-priority workouts) or a total round/rep count (for time-priority workouts). Armed with a completion window, the coach has a better idea of the target metabolic pathway and can scale appropriately. See Appendix 1 (Page 7) for an example of calculating a completion window.

Time domain also impacts volume; that factor is addressed in the Elements of Scaling section below.

General Movement Patterns

When scaling a workout, strive to preserve the programmed movement patterns. CrossFit programming theory broadly categorizes movements into three modalities: weightlifting, gymnastics and monostructural metabolic conditioning (i.e., "monostructural"). To help coaches preserve the intended stimuli when scaling, let's divide these movement modalities into six general movement patterns in Table 1.

Bench press is rarely seen in CrossFit, but it's a great choice if other upper-body pressing movements are not available.

Scott Brayshaw

We preserve movement patterns based on the "compound yet irreducible" property of functional movements. For example, if we want to improve our squatting position and mechanics, then we must squat. Targeted mobility can improve our positions, but if we never squat (even at a reduced range of motion), then we can't fully develop our squat.

This extends beyond CrossFit's nine foundational functional movements. If we avoid upper-body pressing motions involving shoulder extension (dips, push-ups, etc.), then we can't fully develop those movements, nor can we develop the joint stability and motor control required of those movements at heavy loads or volume. In daily application, this means completely avoiding a movement or its scaled variants. If a newer athlete skips ring dips (to include progressions such as push-ups) every time they are programmed, it's unlikely that athlete will ever fully develop safe dips.

A plank is a combined movement that can serve as a substitute for both pressing movements and core work.

Kendra Pratt

Try to preserve the programmed plane of motion, too (usually sagittal or frontal/coronal), but this is a secondary consideration.

Table 2 shows some examples of movements and corresponding scaled movements that preserve similar patterns (not necessarily planes of motion).

Skill progressions go hand in hand with scaling to preserve movement patterns. Having a list of "go-to" progressions gives you immediate scaling options. The CrossFit Hampton Roads website contains a sample pull-up progression that outlines scaling options for workouts with pull-ups.

Having a list like this also expedites scaling for injured athletes. At our affiliate, we begin every class by asking athletes if there are any injuries or illnesses. With that information, the coach uses pre-built progressions to develop scaling plans for the workout. There are times, however, when preserving every movement pattern in a workout is not always possible. This often occurs when working with injuries or permanent disabilities. Remember that movement patterns are one of many possible stimuli. We can still provide quality training without preserving every pattern in every session.

Movement Pattern	Examples
Upper-body pressing & static holds	Strict press, push press, push jerk, split jerk, push-up, bench press, dip, headstand/ handstand push-up, handstand hold, plank, etc.
Upper-body pulling & static hangs	Pull-up, ring row, front lever, static hang from rings or bar, etc.
Lower-body pressing	Back squat, front squat, pistol, etc.
Lower-body pulling	Deadlift, power/muscle clean and snatch, etc.
Accessory core	GHD movements, toes-to-bar, knees-to-elbows, hollow-body work, etc.
Combined patterns	Strict press, push press, push jerk, split jerk, push-up, bench press, dip, headstand/ handstand push-up, handstand hold, plank, etc.
Upper-body pressing & static holds	Muscle-up, wall-ball shot, overhead squat, clean, snatch, kettlebell swing, etc.

Table 1: Six general movement patterns to consider when scaling.

Movement Pattern	Examples
Pull-up (upper-body pulling)	Ring row, single-arm ring row, negative pull-up, assisted pull-up, jumping pull-up
Back squat (lower-body pressing)	Box squat (reduced range), air squat, front squat, goblet squat
Power clean (lower-body pulling)	Elevated starting position, clean pull/high pull, muscle clean, single-arm dumbbell power clean
Headstand/handstand push-up (upper-body pressing)	Handstand hold, push-up, elevated push-up, reduced body angle, strict press, handstand-push-up negatives, reduced range of motion
Double-under	Bar hop, single-under, low-height box jump, quick-tempo box step-up
Toes-to-bar	Sit-up, V-up, hanging knee raise, AbMat sit-up, half-range GHD sit-up

Table 2: Preserving movement patterns in scaling.

3. Complexity

A subsection of the movement-pattern stimulus is movement complexity. Movements that combine the neurologic and organic elements of the 10 general physical skills tend to be the most complex (Olympic lifts, gymnastics elements), but something as simple as the double-under, scaled incorrectly, can drastically alter the workout stimulus. It's important to draw a distinction between training to develop complex movements and applying already-developed complex movements in a workout. Many affiliates wisely incorporate programmed skill work before or after workouts to develop complexity while ensuring quality movement without the pressure of the clock. During timed workouts (i.e., not skill development), scale complexity to preserve the desired metabolic response.

Gymnastics skills are generally the most common elements considered when scaling complexity. But there's complexity within the nine foundational functional movements, too. CrossFit Mobility Trainer Course leader Kelly Starrett provides great resources for understanding complexity in functional movements and for developing a scaling plan in "Becoming a Supple Leopard." An application of Starrett's three movement categories (Chapter 5) is scaling the push jerk to the push press for an athlete unable to receive the push jerk in the re-dip due to shoulder-mobility limitations. This also applies to receiving the snatch in the squat position versus the power position.

If an athlete can consistently accomplish a complex movement with all points of performance, then, in general, scale load instead of complexity. If, however, the movement is not consistently safe, then scale complexity. The ultimate goal is for athletes to continually progress in movement complexity. Trainers must guide their athletes toward this goal instead of allowing stagnation in simplified scales.

Elements of Scaling

Once you understand the programmed stimuli, there are many ways to scale individual movements and workout structures to maximize athletes' training despite limitations.

1. Volume (Total Reps)

"Be impressed by intensity, not volume." —Greg Glassman

Scaling volume is primarily a factor of athlete experience (how long they've trained) and how recently they've trained.

Controlling volume addresses the risk of rhabdomyolysis in less-experienced athletes or those returning after a layoff. Increased volume of eccentric movement (combined with other factors such as experience level, age, etc.) correlates to risk of rhabdomyolysis. As a coach, remember this potent but simple saying: "The poison is in the dose."

Methods of scaling volume include:

- Reducing rep scheme—When scaling reps in a time-priority workout, it's important to scale loading and movement complexity so the athlete progresses through the movements at a pace similar to that of average athletes doing the workout as prescribed. If the workout is scaled too much, the athlete could accumulate more reps than an Rx athlete, defeating the purpose of scaling reps. In these examples, we'll use the terms "intermediate" and "beginner," which are defined in the Experience Level and Pre-Scaled Workouts section below.

Task-Based Workout

Programmed version
4 rounds for time of:
Run 400 m
50 air squats

Scaled version (intermediate)
4 rounds for time of:
Run 400 m
35 air squats

Scaled version (beginner)
4 rounds for time of:
Run 200 m
20 air squats

Time-Based Workout (With Movement Scales)

Programmed version
10-minute AMRAP of:
10 power snatches (115/75 lb.)
15 ring dips
20 GHD sit-ups

Scaled version (intermediate)
10-minute AMRAP of:
6 power snatches (scale load to provide similar stimulus as Rx)
10 ring dips (or scaled alternative in accordance with progression)
15 half-range GHD sit-ups

Scaled version (beginner)10-minute AMRAP of:
5 power snatches (scale load to provide similar stimulus as Rx)
5 ring dips (or scaled alternative in accordance with progression)
10 AbMat sit-ups (or similar movement pattern)

- Reducing time protocol to control reps—To keep athletes working together as much as possible, it's advisable to primarily scale reps and limit time reductions. However, certain junctions of experience and workout duration (i.e., inexperience and a long workout) require reducing the time domain.

Programmed workout
25-minute AMRAP of:
7 push-ups
12 deadlifts
15 box jumps

Scaled version (intermediate):
15-25-minute AMRAP in which load, reps and complexity are scaled to keep round pacing similar to that of Rx athletes.

Scaled version (beginner):
10-12-minute AMRAP in which load, reps and complexity are scaled to keep round pacing similar to that of Rx athletes.

Regardless of how an athlete is scaled (load, movement pattern or complexity), remember to consider the total rep volume. Do not increase volume just because you, as a coach, perceive the movements or load are simpler than what was programmed. For example, if ring dips are scaled to box dips for an inexperienced athlete, don't increase volume to compensate for the reduced complexity.

2. Load

When trainers and athletes think of scaling a CrossFit workout, loading is generally the first element they consider; however, it is rarely the only or even the most important element that requires scaling. Remember, we're scaling to preserve the desired stimulus while assessing factors such as range of motion (ROM) and total rep volume. Here are a couple of considerations when scaling loads:

- In general, prioritize ROM over load, but it's important to consider the original stimulus and long-term progression of the athlete.
- Scale loads to avoid losses of points of performance; the appropriate load can vary day to day.
- Be wary of reducing load to the point that the athlete accumulates more reps than is appropriate for his or her experience. Adjust reps, rounds, times or complexity in concert with loads to control total rep count.

Example: Lower-rep heavy goblet squats are programmed (rep tempo is likely to be slower). An athlete with a full-ROM air squat rounds her back with sub-Rx anterior loading. Because the stimulus for this workout includes heavy loading, we'll strive to preserve a load that is heavy relative to Athlete 1's abilities. Because the athlete can do a full-ROM air squat, we'll gradually add loading in the warm-up, looking for the point at which the athlete can no longer consistently maintain points of performance at full ROM. This type of scaling is relatively simple.

If an athlete is challenged with any anterior load due to extremely poor motor control (train-wreck squat) or an injury, we need to be more creative. For this workout, we can consider having the athlete hold an object closer to the frontal plane (such as dumbbells on the shoulders) or even shifting to posterior-loaded squatting (back squat). Regardless of where the load is, we strive to preserve the rep/load stimulus of the programmed workout. If an athlete is unable to use any loading, then we can use unloaded air squats but challenge the depth—if even by an inch below existing ROM—with an object such as a box or ball.

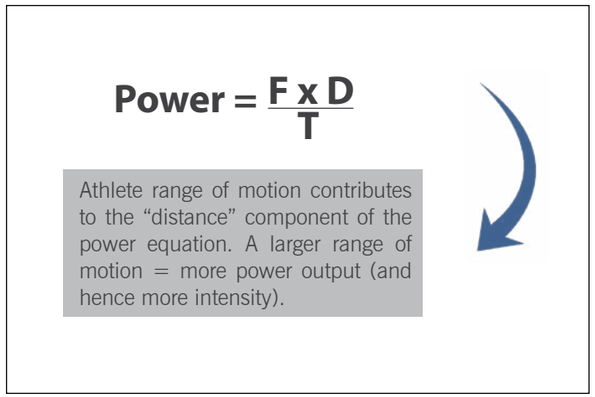


Figure 1: Range of motion affects power and, therefore, intensity.

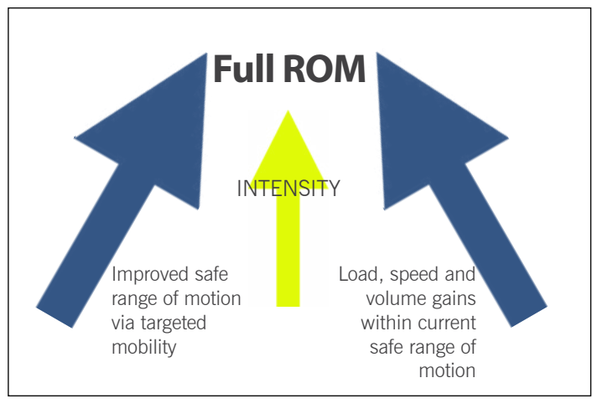


Figure 2: Long-term plan to increase intensity and range of motion.

During warm-up, identify the athlete's daily safe ROM for the movement: the point where the athlete consistently loses points of performance despite coaching cues (verbal, tactile and visual).

- Scale ROM to keep the athlete within their safe ROM for the workout.
- Modify movement ROM at the starting position (raising deadlift) and/or the finishing position (stopping kettlebell swing at eye level).
- Scaling may include objects to act as tactile cues in some cases (butt target for squat).

Figure 3: Checklist for range-of-motion scaling.

3. Range of Motion

ROM is a critical component in developing fitness; the distance component of the power equation highlights this (Figure 1). A limited ROM reduces work capacity and is indicative of a missing component of fitness. Scaling ROM requires the ability to identify points of performance and an understanding of general movement principles, such as the need to maintain a neutral spine during loaded movement.

Use functional movements (squats, presses, deadlifts) as assessment tools to identify ROM limitations. At our affiliate, we call the overhead squat the "yellow highlighter of mobility"; on any given day, we can assess our athletes' shoulder, hip, knee and ankle ROM with just a few reps.

The range in which an athlete can maintain points of performance for a specific movement is called the safe ROM. An athlete's safe ROM can vary on a day-to-day basis. Exceeding safe ROM increases injury risk and decreases efficiency. While seemingly innocuous in a single rep, something as simple as a small tuck of the hips in an air squat or an internal roll of the shoulder in an overhead squat can have severe structural impact when we add speed, volume or load. As responsible coaches, we can't instruct proper form during warm-ups only to watch passively as an athlete does 100 wall-ball shots with loss of neutral spine every squat.

This slows each rep and helps preserve the original stimulus: The challenge of maintaining points of performance through the increased ROM slows the athlete down in the same way as heavy loading. If the WOD is time-based and the athlete is progressing too quickly, we may need to reduce the rep count, increase complexity or decrease workout time to control total rep exposure.

Scaling for ROM is part of a bigger plan for long-term athlete development. Once a ROM limitation is identified, use coaching cues (tactile, visual and verbal) to identify whether the root cause of the limitation is poor motor control, mobility restriction or both. After identifying the root cause, scale ROM during workouts to develop intensity within the existing safe ROM, while applying mobility and motor control outside workouts to increase safe ROM. This long-term ROM-development plan is illustrated in Figure 2.

Scaling for ROM limitations is simple: Keep athletes within a ROM that allows consistent execution of the movement's points of performance. Apply load, speed and volume within the athlete's current (but expanding) safe ROM in line with CrossFit's methodology of technique versus intensity. This approach increases work capacity within the athlete's current safe ROM as the athlete independently works to improve safe ROM. The two actions converge with the athlete's moving at full ROM with improved work capacity. There are many ways to scale ROM in the starting positions (e.g., elevating deadlift set-up) and ending positions (e.g., top of kettlebell swing).

Here's an example: Travis is a 34-year-old male who just completed your affiliate's three-week intro course. He struggles to maintain a neutral spine during squats and deadlifts; his lower back predictably rounds despite multiple cues. Your goal is to help Travis achieve full ROM in these movements while increasing work capacity within his current safe ROM.

You've assigned a mobility protocol and movement drills for warm-ups, cool-downs and outside the gym (the left arrow in Figure 2). This includes mobility exercises and movements such as banded good mornings to improve motor control and positional awareness. Now we need to effectively scale Travis during workouts.

Today's workout involves wall-ball shots. This is a combined movement pattern; of note for Travis, it involves a squatting element. After coaching Travis through squats during warm-up, you have a good idea of how he's moving today and roughly where he's losing his lumbar curve. It's important to assess safe ROM during controlled repetitions, not during the workout under the duress of time, speed, volume, complexity or load.

Next, you watch Travis perform a front squat with a light medicine ball. You have him squat to a "target"—a medicine ball stacked on a 45-lb. plate or an appropriately sized box. The target is a tactile cue for Travis to remain within today's safe ROM. Remember, the height of the target will likely change day to day, and it will lower as he improves mobility and motor control. As Travis progresses, there will likely be a time when his safe ROM is still above parallel but he has the motor control to maintain a neutral spine without the target.

You then assess Travis' ability to maintain front-squat points of performance within his scaled ROM with load. If he cannot maintain points of performance with the medicine ball despite coaching cues, decrease the medicine-ball weight (including changing the movement to a PVC thruster) or elevate his squat target. Both scaling approaches can reap training benefits while protecting Travis; don't rely on the same scaling method every time.

If an athlete can't do a full burpee due to pain with elbow flexion, consider scaling range of motion and having him descend only into a plank position before rising.

Christopher J. Nolan/CrossFit Journal

Travis' example demonstrates controlling ROM based on points of performance at the eccentric end range of a movement, but we also find ROM limitations in the concentric end range of movements. Let's look at another common but oft-neglected ROM-scaling opportunity: the overhead position.

The target ROM is full shoulder flexion (arms straight overhead), hands at shoulder width or narrower, elbows straight and midline neutral (not overextending the lumbar or thoracic spine). Two example movements are the kettlebell swing and kipping pull-up.

With tight shoulders, it's challenging to swing a kettlebell directly overhead without bending and flaring the elbows (internally rotating the shoulders) or overextending the thoracic or lumbar spine. If you see an athlete's bent elbows flare to the side as the kettlebell approaches the top and coaching cues do not correct the fault, it's likely the athlete is missing full shoulder ROM. Pressing movements (press, push press and push jerk) generally highlight shoulder-mobility restrictions early in training, but some limitations are accentuated in specific movements. For example, with barbell movements, moving the hands wider can mask shoulder-flexion limitations (or accommodate them depending on how you look at it). But because the grip width is narrow with kettlebell swings, shoulder-flexion limits are highlighted.

If coaching cues don't correct the fault, then scale the kettlebell-swing ROM by reducing swing height based on where the athlete's elbows start bending or where the athlete starts losing the midline. It's difficult for some athletes to recognize when these faults occur, so provide a definitive limit such as, "Stop with the kettlebell at eye level." Athletes with poor body awareness need definitive ROM limits established prior to the start of the workout.

For the kipping pull-up, an athlete missing full shoulder flexion often has the same bent, flared elbows (internally rotated shoulder) or "broken" midline (overextended thoracic or lumbar spine) at the front of the kip. If coaching cues don't fix the movement fault, we can scale to strict pull-ups or other steps in a pull-up progression while addressing shoulder mobility separately. Do not watch athletes do repeated reps beyond their safe ROM; it is a coach's responsibility to intervene.

During warm-up, identify the athlete's daily ROM for the movement—the point where the athlete consistently loses points of performance despite verbal, tactile and visual coaching cues.

- Scale ROM to keep the athlete within safe ROM for the workout.
- Modify movement ROM at the starting position (e.g., raising deadlift bar off the floor) and/or the finishing position (e.g., stopping kettlebell swing at eye level).
- Scaling may include objects to act as tactile cues in some cases (e.g., a ball as a depth target for a squat).

Now let's apply our understanding of preserving stimuli and scaling to an example. Tables 3 and 4 outline a sample workout scaled for two individuals with differing needs.

Experience Level and Pre-Scaled Workouts

An efficient method for scaling at affiliates is designing pre-scaled versions of daily workouts. Pre-scaled workouts are simply an outline to expedite scaling for a class setting. A general approach is to offer versions for intermediate and beginner athletes.

It's important to remember that experience level is just one of many factors, so the naming convention does not necessarily dictate who will use which scaled version. Additionally, coaches may need to pick elements from multiple scaling levels to preserve the programmed stimuli for a single athlete. For example, a coach has an injured "experienced" athlete who normally does Rx movements and loads. The coach might need to choose movement patterns from the beginner scaled version and a rep scheme from the intermediate scaled version to accommodate this athlete. It's also important to remember the impact of age. Intermediate-level loads and reps may be appropriate for an experienced masters athlete.

Because I've used the beginner/intermediate/experienced naming convention, I'll offer definitions to help a coach identify which scaled version is appropriate for athletes in a class.

Beginner—Beginners are still developing ROM, body awareness and consistency in the nine foundational movements. They are identifying goals and learning how to develop plans and timelines to achieve them. Beginners need specific guidance on how to scale most elements in workouts. They are likely lifting submaximal loads (not going for absolute 1-rep maxes) due to continued development of movement patterns. Technical lifts require consistent coaching. The beginner is developing basic body and positional awareness to apply to gymnastics and body-weight elements. These athletes generally need scaling in at least one element to preserve the desired workout stimuli. Athletes at this level have been consistently doing CrossFit for fewer than 18 months.

Intermediate—Intermediate athletes can consistently perform the nine foundational movements pain-free and at full range of motion while adhering to all points of performance. The intermediate athlete has clearly defined goals, a method to achieve those goals and can often outline how he or she needs to scale workouts These athletes are still developing baseline strength (1-rep-max jumps of 10+lb.) but know maximal loading for all major lifts and can quickly identify if and how they need to scale loading. Technical lifting form is consistent. They are working through clearly defined progressions for gymnastics and technical body-weight work. These athletes have strict versions of pull-ups, handstand push-ups and dips, and they have the body awareness to develop kipping. They have a good idea of appropriate

Athlete 1 (male, 39): 14 months of experience, medial elbow pain (epicondylitis)

Programmed workout	Scaled workout
12-minute AMRAP of: • 10 thrusters (105/75 lb.) • 10 pull-ups • 10 burpees	12-minute AMRAP of: • 10 single-arm dumbell thrusters (20 lb.) • 5 single-arm rows • 10 step-down-plank burpees

Table 3: Scaling movement patterns for an injured athlete.

Athlete 2 (female, 24): Two months of experience, previously sedentary with limited squat ROM (tight hips and ankles)

Programmed workout	Scaled workout
12-minute AMRAP of: • 10 thrusters (105/75 lb.) • 10 pull-ups • 10 burpees	12-minute AMRAP of: • 5 barbell thrusters with controlled squat above parallel to target (35 lb.) • 5 ring rows • 5 burpees (step in to avoid passing through squat with loss of midline and weight on toes)

Table 4: Scaling movement patterns an inexperienced athlete with limited ROM.

Justin Jindra

Coaches are advised to consider volume when programming for competitions. For many athletes, three to five workouts a week is normal, so five workouts in a day can create cumulative stress.

scaling for gymnastics elements based on their progression. Intermediate-level athletes have been consistently doing CrossFit for roughly 18-36 months.

Experienced—The experienced athlete meets the description of the intermediate athlete with some additions: Experienced athletes are refining form, mobility and training methods to increase maximal lifts (including technical lifts). They have mastered all basic gymnastics elements and are working on advanced movements (planche, lever, more complex rings elements, presses to handstands, etc.). When healthy, they do not require scaling for daily workouts. Experienced athletes have been consistently doing CrossFit for more than 36 months.

Returning Athlete—This is generally an intermediate or experienced CrossFitter who has taken a layoff from volume eccentric training for one month or more. These athletes are at risk due to their previous abilities in CrossFit but lack of recent exposure to volume. Despite likely protestations, these athletes need a period (likely two weeks or more) of scaled volume to reduce the risk of rhabdomyolysis.

Application in Competitions

Increasingly, fitness competitions (including the CrossFit Games Open) have "scaled" divisions. Scaled divisions draw athletes who qualify as beginner or intermediate.

Common errors when programming for competition scaled divisions are:

1. Reducing load, time or complexity but not adjusting the total rep count or total potential rep count—If you reduce loads and/or modify movements but keep the rep count and time domain unchanged, you are likely to increase risk for less experienced athletes. You must consider total rep exposure. Remember this when developing chippers and AMRAPs, too. Have realistic boundaries for rep count based on athlete experience. For example, we could say that a workout needs adjusting for beginners if it exceeds 30-75 cumulative reps for upper-body movements or 50-100 cumulative reps for lower-body movements. These are not recommended numbers; they are just examples of boundaries to consider when developing workouts for scaled divisions.

	Wall Ball	Transition	KB	Transition	Row	Transition	Round Time
Round 1	20-45s	5-10s	30-45s	10-20s	45-80s	10-20s	120-220s
Round 2	20-55s	5-10s	30-60s	10-20s	45-80s	10-20s	120-245s
Round 3	20-55s	5-10s	30-60s	10-20s	45-80s		110-225s
Total	60-155s	15-30s	90-165s	30-60s	90s-240s	20-40s	5:50-11:30

Table 5: Forecasting a completion window for a sample three-round workout with wall-ball shots, kettlebell swings and rowing.

2. Not considering the cumulative effect of multiple workouts over the course of the entire competition—For beginner or intermediate athletes doing normal training at an affiliate, three to five workouts a week is likely the norm. Exposing them to multiple workouts over the course of a day or weekend has a compounding effect on their ability to recover and their motor control in challenges later in the competition. As a rule, rep count and loads should decrease over the course of an event for scaled divisions. Ending competitions with a long chipper might have a margin of safety for very experienced athletes, but it's not responsible programming for less experienced athletes.

Appendix 1: Forecasting a Workout Time or Rep Window

A helpful scaling tool to determine the intended stimulus for time domain and metabolic pathways is forecasting a completion window based on the programmed movements, reps and loads. This window is a time (for task-priority workouts) or a total round/rep count (for time-priority workouts). Armed with a completion window, the coach has a better idea of the target metabolic pathway and can scale appropriately. Below is one example of how to estimate a completion window.

Don't get stuck questioning the estimated times for each movement; remember that an "experienced" athlete does not imply he or she is Games level. Focus on the process and apply it to your own workouts to test your accuracy.

3 rounds for time of:
10 wall-ball shots (20/14 lb.)
15 kettlebell swings (70/55 lb.)
Row 250 m

A single wall-ball repetition, scaled appropriately, will generally take 2 or 3 seconds. For an intermediate or experienced CrossFitter, little or no pause between reps is required. For a beginner, slower turnover or a brief pause to set correct body position between reps may increase time per rep. For our first round, 10 reps scaled appropriately will take roughly 20 seconds (most experienced) to upwards of 45 seconds (beginners). As fatigue sets in, we'd expect less conditioned athletes to require more time per rep or to break up the reps. We'll factor in a 10-second break for the second and third sets for beginners.

We can now estimate that over the course of the workout, athletes will spend 1:00 (experienced) to 2:35 (beginners) on wall-ball shots. We can estimate an average of about 5 seconds (experienced) to 15 seconds (beginner) of transition time between wall-ball shots and kettlebell swings. This creates 15-45 seconds of transition time over the course of the 3-round workout.

We use the same approach to estimate times for heavy kettlebell swings. We'll use an average of 2 seconds (experienced) to 3 seconds (beginner) in Round 1 (no breaks). This equates to 30-45 seconds spent on kettlebell swings. Over the remaining 2 rounds, we'll assume beginner athletes require breaks. A 15-second break in each of the remaining 2 sets adds 30 seconds total. We'll apply 10-20 seconds of transition time to get strapped into the rower. This is 30-60 seconds over the course of the workout.

Finally, we'll estimate a 45-second 250-m row for an experienced male athlete (keeping in mind time is dependent on the weight of the athlete). For a lighter, shorter beginner-level athlete, the row may take upward of 1:20. Allow for 30-60 seconds of cumulative transition time (10-20 seconds per round) from the rower back to the wall-ball station.

We add the times to get a completion window (see Table 5).

The completion window of 5:50-11:30 is an estimate. Some athletes may finish quicker and some may take slightly longer. But if an athlete takes less then 3 minutes or more than about 15 minutes to complete this workout, than you likely scaled reps, load or ROM incorrectly. ■

About the Author

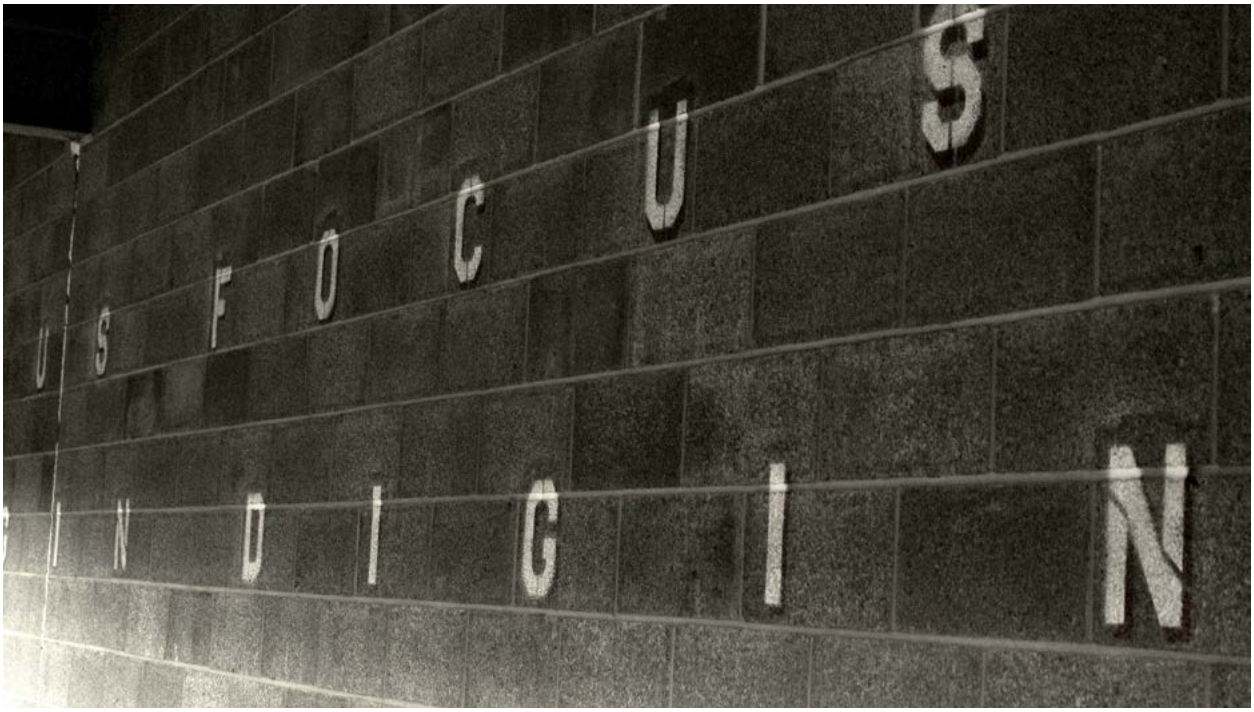
Jeremy Gordon, CCFC, was the head coach and CEO of CrossFit Hampton Roads from 2008 to 2015. He began CrossFit in 2005. Jeremy coaches at CrossFit Hampton Roads and provides online coaching for competitive-level CrossFit athletes. He is the proud husband of Nicole Gordon (CrossFit Seminar Staff) and parent of two phenomenal kids. He is a 17-year veteran fighter pilot flying with the Virginia Air National Guard.

THE CrossFit JOURNAL
VIRTUOSITY

Virtuosity 11: Dig In

Two words on a wall define a tight-knit group of athletes who are ready to face any challenge.

By Jason Taylor **October 2015**



Gary Tsai

Dig in.

These two words greet me upon each arrival to CrossFit Focus in Pittsburgh, Pennsylvania. The five letters together represent a mantra that will pull you through grueling workouts or the challenges of life itself.

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At this box we are a family—our "Focus family," as it is often called. Many times in the midst of a grinding workout, I have glanced up between strained breaths and witnessed my brothers and sisters finishing one more rep with that same determination and those two words boldly reflected in their eyes. In these moments I strive, because as I look to them, so they look to me, and together we reach amazing new goals.

It's when the clock strikes the hour and the time has come to forget the day's stress. No bills, no meetings, no deadlines. It's time to dig in.

It's when there's a load on my back that feels impossible and doubt begins to creep in, but it's wiped away when the coaches catch my eye and I know what's coming. Dig in and know that if you get down, you will rise—if not this time, then the next.

When training has ended and the real world comes crashing back, I know that this mentality and fortitude will permeate every aspect of life.

It is not only this attitude but also the people who make CrossFit Focus so remarkable. On more than one occasion, head coach and owner Bryan Morse has offered to help members pay for shoes, and I have seen coach Chris Redding selflessly dedicate extra time to help others, even when family commitments leave few moments to spare. Members have organized charity events, birthday celebrations and baskets for newborn babies.

We persevere—week by week, day by day, sometimes even hour by hour—celebrating each new muscle-up, double-under and PR as if it were our own. More so, in fact, because for us these achievements reflect on everyone at the gym.

At CrossFit Focus, you are not just a credit-card number that gets processed every month. You are treated as an athlete—and a valuable one. The monthly rates have not been raised and are kept affordable because our coaches have favored growth, achievement and community over driving a new car.

This is my box—and a great source of pride. This is CrossFit Focus.

Submission Guidelines

To be considered for publication, authors must satisfy the following:

1. Articles must be original, unpublished works. Authors of selected submissions will be supplied with legal documents to be filled out prior to publication.
2. Articles must be submitted in Word documents attached to an email. Documents should not contain bolding, italics or other formatting. Please submit in Arial font.
3. Articles can be 500 words maximum.
4. Each article must be accompanied by at least one high-resolution photograph to illustrate the story. The photo can feature the coach, the affiliate, the community—anything that illustrates the article. Photo guidelines are as follows:

   A. Photos must be original and owned by the person submitting. Photos taken by others may be submitted provided the owner has given permission.

   B. Photos must be in focus, well lit and free of watermarks. Minimum file size is 1 MB. Please review your camera's settings to ensure you are shooting high-resolution images. Cell-phone photos and thumbnails are not accepted.

   C. Photos must be attached to the email as JPEG files. Do not embed files in Word documents. Photo file names should list both the name of the subject and the name of the photographer in this format: SubjectName-PhotographerName.jpg. Examples: JohnSmith-JaneDoe.jpg or CrossFitAnyTown-JimJohnson.jpg.

Virtuosity@crossfit.com is open for submissions. Tell us why you train where you train, and do it uncommonly well.

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THE CrossFit JOURNAL

VO2 MAX-EFFORT LIFT

BY CHRISTIAN LARSON

Once considered the gold standard of fitness, VO_2 max is now just one aspect of athletic performance.

Courtesy of Carmine Sarazen

Shaun Cleary/CrossFit Journal

CrossFit has blurred the line between conditioning and strength work. For example, gymnastics and barbells can be combined in intervals that dramatically affect the aerobic system.

Rudy Wolff/CrossFit Journal

CrossFit athletes rarely face long, single-modality tests. In most cases, traditional "cardio" activities are combined with other elements, creating interval work. In the 2014 Reebok CrossFit Games, a 3,000-m row was followed by 300 double-unders and a 3-mile run.

"By analyzing the amount of oxygen you consume, the (VO_2 max) test determines how efficiently your body extracts and uses oxygen from the air. This makes it the gold standard of fitness markers, as well as a strong indicator of your overall health."

That statement appeared in the April 21 Menshealth.com article "5 Health Tests That Could Save Your Life" (7).

Do you think it's correct? Incorrect? Partially correct?

As CrossFit athletes, we're interested in a broad and inclusive fitness, high levels of general physical preparedness (GPP) and increased work capacity. CrossFit training is often characterized by intensity, and many CrossFit athletes aren't especially fond of long, steady-state workouts that require lower intensity due to their duration. That's OK, because we can achieve aerobic adaptations through the interval work that has always been a large part of CrossFit programming.

"Properly structured, anaerobic activity can be used to develop a very high level of aerobic fitness without the muscle wasting consistent with high volumes of aerobic exercise!!" CrossFit Founder and CEO Greg Glassman wrote in the CrossFit Journal article "What Is Fitness?" "The method by which we use anaerobic efforts to develop aerobic conditioning is 'interval training'" (4).

The more we understand about the mechanics of aerobic adaptation, the better the foundation for solid programming, so let's take a quick look at these adaptations through the lens of the Fick equation, named for German physiologist Adolf Eugen Fick.

What the Fick?

The Fick equation reads as follows: $VO_2 = Q \times (a - vO_2)$.

- VO_2 is the amount of oxygen utilized by our bodies, measured in liters per minute.
- Q is cardiac output—heart rate (HR) x stroke volume (SV). HR is measured in beats per minute, and SV is defined as the amount of blood ejected from the heart per beat (ml/beat).
- $a - vO_2$ is the difference in arterial and venous oxygen content, measured in ml of oxygen per 100 ml of blood. This is a measure of oxygen extraction at the tissue (skeletal muscle for our purposes).

The question: "How does training affect these variables and allow us to improve our VO_2 max?"

We know that the two determinants of VO_2 max are genetics and training, with genetics being the major contributor (about 60-70 percent genetics versus about 30-40 percent training) (2).

Alterations in Fick-Equation Variables With Endurance Training

Rest:

$\leftrightarrow VO_2 = \leftrightarrow Q \times \leftrightarrow (a - vO_2)$

$\leftrightarrow Q = \downarrow HR \times \uparrow SV$

Max Exercise:

$\uparrow VO_2 = \uparrow Q \times \uparrow (a - vO_2)$

$\uparrow Q = \leftrightarrow HR \times \uparrow SV$

Let's look at cardiac output first, referencing the above equations.

With aerobic training, we see a couple of changes in the determinants of Q (cardiac output) at rest. Resting Q remains the same, but SV increases, allowing for a lower HR (training bradycardia).

As we examine the max-exercise equation for cardiac output, we see a couple of changes post training as well. Q has increased, max heart rate is unchanged (but may decrease), and SV has increased. At this point we can eliminate HR as a causal factor in increasing VO_2 max. SV increases with aerobic training—but how?

One of the first adaptations to aerobic training is increased blood volume due to increases in plasma and red blood cells, leading to an improved capacity to transport oxygen. The

increased blood volume also increases the stretch on the left ventricle, leading to increased filling. These two adaptations lead to a larger amount of blood ejected per beat—a larger stroke volume.

The third variable in the Fick equation—a - vO_2—also increases with training. In untrained individuals, the difference at rest is about 5 ml of O_2 per 100 ml of blood, and it increases to about 15 ml of O_2 per 100 ml of blood at max exercise. As you can see, oxygen extraction at the muscle increases with increasing exercise intensity. With aerobic training, this difference can increase to about 18 ml of O_2 per 100 ml of blood, meaning the body becomes better at offloading oxygen at the muscle.

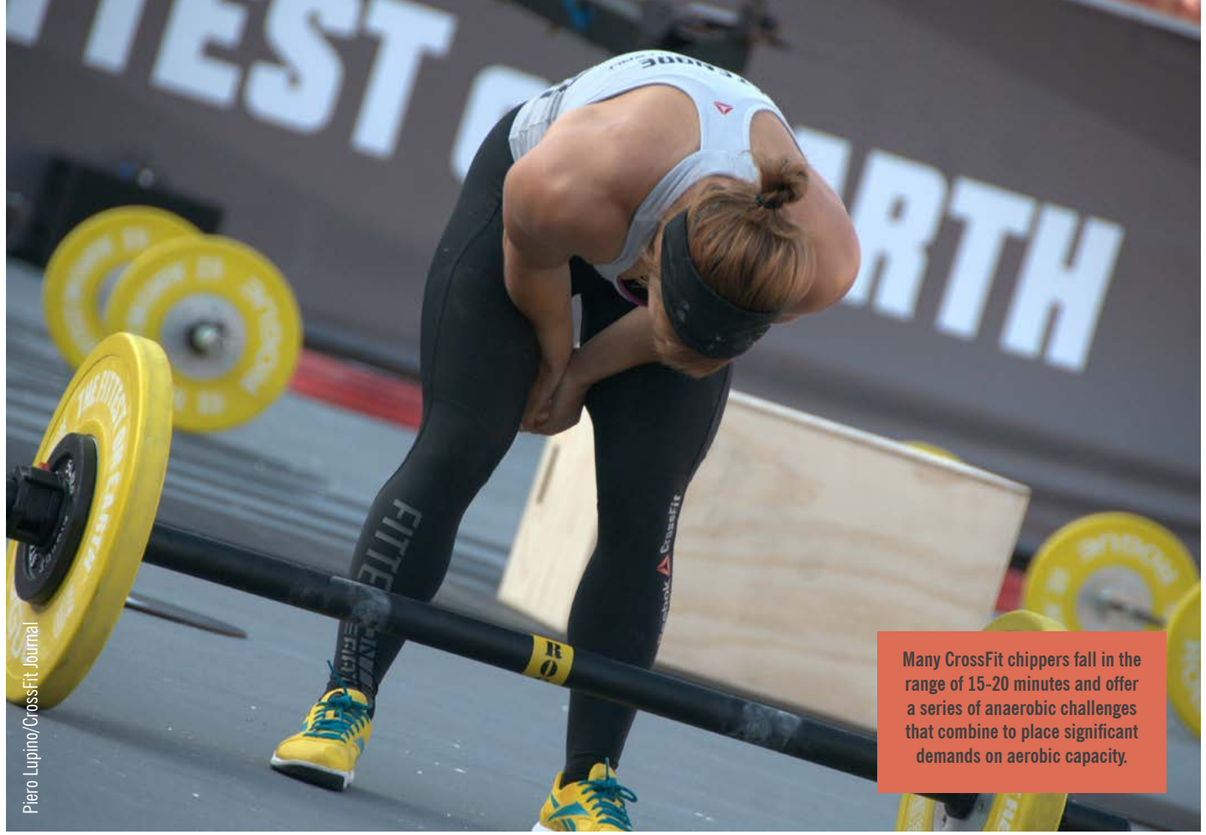
By looking at the Fick equation, we see part of how we adapt aerobically: primarily via increases in stroke volume (due to increased blood volume), and to a lesser extent via increases in the difference between arterial and venous oxygen content.

In application, this gives us an understanding of the rationale behind the CrossFit exercise prescription. For workouts lasting longer than two minutes that require an elevated heart rate for the duration, we will likely see some aerobic adaptation even if the workouts include lifting or gymnastics and are far from the "steady-state conditioning" common in running, cycling or other endurance sports.

> "Strive to blur distinctions between 'cardio' and strength training. Nature has no regard for this distinction or any other."
>
> —Greg Glassman

"Strive to blur distinctions between 'cardio' and strength training. Nature has no regard for this distinction or any other," Glassman wrote in "What Is Fitness?"(4).

In the CrossFit Level 2 Trainer Course, it is suggested that we keep the majority of our workouts shorter than 15 minutes because this time domain allows for the manipulation of intensity and movements to provide broad adaptation in strength, power and aerobic endurance. All three are important for the development of GPP.



Piero Lupino/CrossFit Journal

Many CrossFit chippers fall in the range of 15-20 minutes and offer a series of anaerobic challenges that combine to place significant demands on aerobic capacity.

Thomas Campitelli/CrossFit Journal

CrossFit's best athletes have impressive endurance and stamina in addition to amazing strength, flexibility, power, speed, coordination, agility, balance and accuracy.

The Gold Standard?

This leads us back to the Men's Health quote:

1. "By analyzing the amount of oxygen you consume, the test determines how efficiently your body extracts and uses oxygen from the air."

For the purposes of this article, the description is adequate.

2. "This makes it the gold standard of fitness markers, as well as a strong indicator of your overall health."

Men's Health is obviously referring to aerobic capacity—not GPP—as "fitness," and if VO_2 max were indeed the gold standard, we wouldn't need to run distance races anymore. We would simply have athletes test their VO_2 maxes and declare a winner.

CrossFit Games champion Rich Froning Jr. posted a VO_2 max of 73.9 ml/kg/min to Instagram early in 2015 (3), and while the number is definitely impressive when compared to normative data, it's unlikely Froning's success can be attributed to VO_2 max alone. But would this number make him a better endurance athlete than those with lower VO_2 max numbers?

Olympic marathon champions Peter Snell (72.3 ml/kg/min) and Frank Shorter (71.3 ml/kg/min) recorded VO_2 maxes lower than Froning's (6), but Froning would not have been competitive in a marathon with these athletes.

Although a relatively high VO_2 max is important to be successful in endurance activities, other markers correlate more closely to overall fitness: lactate thresholds and critical power (1,5,9).

Lactate threshold is the point at which lactate begins to accumulate in the blood during exercise, and critical power is determined by using test results to graph power output against time and determine the point at which power decreases level off as time increases. These two variables are also more "trainable" than VO_2 max, and the more one can increase these variables relative to VO_2 max, the longer higher work rates can be maintained.

For example, if two people have the same relative VO_2 max and compete in an endurance-based event, the one with the higher lactate threshold and/or greater critical power will likely win (all else being equal). This could also hold true for someone with a lower relative VO_2 max and higher lactate threshold and/or greater critical power.

Shaun Cleary/CrossFit Journal

Four-time CrossFit Games champ Rich Froning Jr. boasts an impressive VO_2 max of 73.9 ml/kg/min, but it's more likely his success can be attributed to his lactate threshold and critical power.

Furthermore, it should be obvious to CrossFit athletes that cardiovascular/respiratory endurance is but one of CrossFit's 10 fitness domains. It's rather useless in CrossFit if an athlete hasn't the strength to lift a barbell or the flexibility that will allow him or her to achieve optimal positioning in movements.

What about VO_2 max as a strong indicator of "overall health"? The literature seems to back that up if we're talking about cardiovascular health, but once a certain VO_2 max level is reached, continued improvements don't decrease the risk of chronic cardiovascular disease (for normative VO_2 max data, see 10). In conditions such as heart failure, VO_2 max dips into the very bad range, and patients may hit their max VO_2 simply trying to walk across the room. Obviously, this lack of exercise tolerance becomes a major concern (8,11,12).

While VO_2 max might have been considered a gold standard of endurance at some point, we have demonstrated that it is but one of several important variables, and its status as the gold standard is not backed up by data. VO_2 max should be regarded as one of many variables involved in fitness, defined as increased work capacity across broad time and modal domains.

Now go do Murph and increase your stroke volume! ■

References

1. Ade CJ, Broxterman RM, and Barstow TJ. Critical velocity and maximal lactate steady state: Better determinants of 2-hour marathon. *Journal of Applied Physiology* 110: 287-288, 2011.

2. Bouchard C, An P, Rice T, Skinner JA, Wilmore JH, Gagnon J, Perusse L, Leon AS, and Rao DC. Familial aggregation of VO2max response to exercise training: Results from the HERITAGE Family Study. *Journal Applied of Physiology* 87: 1003-1008, 1999.

3. Froning R. Instagram, 2015. Available at https://instagram.com/p/xpX-EGs0HE/?taken-by=richfroning. Accessed Sept. 9, 2015.

4. Glassman G. What is fitness? *CrossFit Journal*: Oct. 1, 2002. Available at http://journal.crossfit.com/2002/10/what-is-fitness-by-greg-glassm.tpl. Accessed Sept. 9, 2015.

5. Jones AM, Vanhatalo A, Burnley M, Morton RH, and Poole DC. Critical power: Implications for determination of VO_2 max and exercise tolerance. *Medicine and Science in Sports Exercise* 42: 1876-1890, 2010.

6. Lavin G. "VO2 what?" Fitnessredefined.com. Available at http://www.fitnessredefined.com/vo2-what/. Accessed Sept. 9, 2015.

7. Park J. "5 health tests that could save your life." Menshealth.com, April 21, 2015. Available at http://www.menshealth.com/health/5-health-tests-could-save-your-life. Accessed Sept. 9, 2015.

8. Piña IL. Exercise capacity and VO_2 in heart failure. Uptodate.com. Available at http://www.uptodate.com/contents/exercise-capacity-and-vo2-in-heart-failure#H15. Accessed Sept. 9, 2015.

9. Poole DC. Resolving the determinants of high-intensity exercise performance. *Experimental Physiology* 94: 197-198, 2008.

10. Quinn E. "The Bruce treadmill test protocol." About.com. Available at http://sportsmedicine.about.com/od/fitnessevaland-assessment/a/Bruce_Protocol.htm. Accessed Sept. 9, 2015.

11. Wanderley Braga AMF, Rondon MUPB, Negrão CE, and Wajngarten M. Predictive value of ventilatory and metabolic variables for risk of death in patients with cardiac failure. *Arquivos Brasileiros de Cardiologia* 86: 451-458, 2006.

12. Whipp BJ, and Ward SA. Quantifying intervention-related improvements in exercise tolerance. *European Respiratory Journal* 33: 1254-1260, 2009.

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Christian Larson lives in Manhattan, Kansas, with his wife, Lindsay, and daughters Avery and Delaney. He received a B.S. and M.S. in kinesiology with an emphasis in physiology from Kansas State University. He is an instructor and advisor in the Kinesiology Department at Kansas State, teaching undergraduate courses in biomechanics and exercise science. Christian is also the coordinator of K-State CrossFit, which is housed within the Kinesiology Department. He is a CF-L3 trainer and a member of CrossFit Inc.'s Seminar Staff as part of the CrossFit Kids team, and he sits on the Certified CrossFit Trainer Board. Christian is the fourth best athlete in his family.

Christian gives special thanks to Dr. Ryan Broxterman for editing and content assistance.

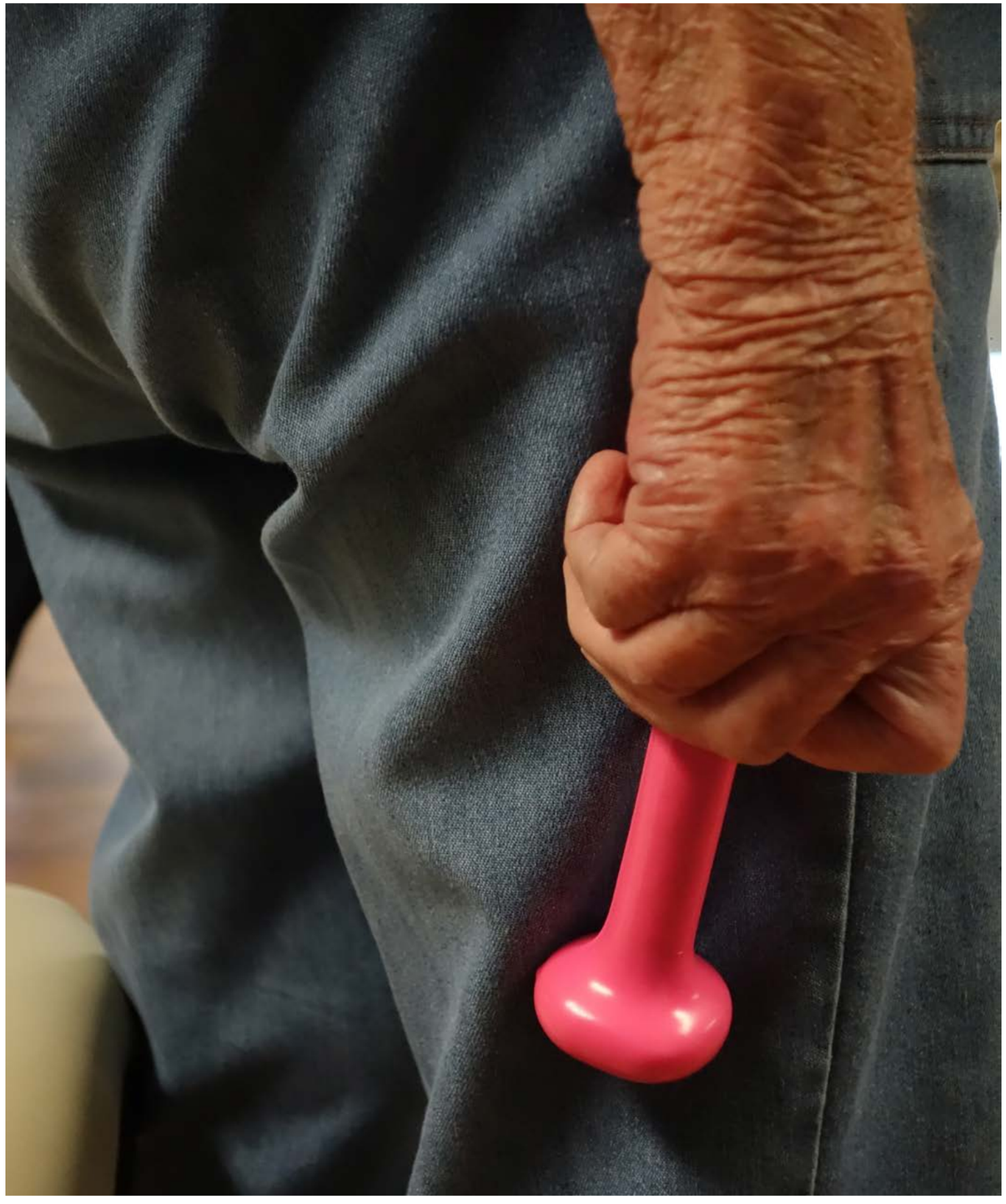
THE CrossFit JOURNAL

EL ANIMADOR DE ADULTOS MAYORES

POR ANDRÉA MARIA CECIL

Después de ver un anuncio en Craigslist, el dueño de CrossFit Salem Andy Bolliger tuvo éxito en desarrollar un programa de fitness para ayudar a los adultos mayores a mejorar su calidad de vida.

Todos imágenes: Andréa Maria Cecil/CrossFit Journal



Algunas mujeres dentro de la clase de Andy Bolliger en la comunidad para adultos mayores Hidden Lakes han solicitado mancuernas más pesadas.

Andy Bolliger (centro) enfatiza una espalda derecha en el peso muerto con su grupo de adultos mayores.

El baile de cuadrilla era su favorito.

Pero mientras Bonnie Johnson envejeció, su equilibrio se volvió poco confiable. Ella comenzó a utilizar una andadera. Bailar cuadrilla con su esposo, Norman, ya no era posible.

El verano del 2014, la pareja se mudó a Hidden Lakes, una comunidad de adultos mayores en Salem, Oregon. Ambos Bonnie y Norman usaban andaderas para poder seguirse moviendo.

“Ella se estaba cayendo cuando se mudó aquí,” dijo Joyce Fowlkes, coordinadora de actividades de enriquecimiento en Hidden Lakes.

Eso cambió después que la pareja empezó a asistir a las clases de ejercicio de 30 minutos dos veces a la semana. Después de pocos meses, Bonnie era capaz de ocasionalmente dejar su andadera por su bastón.

“Sentí que mi fuerza mejoro mucho,” dijo a los 82 años.

Ella continuó: “No me caigo tan fácil. Y si comienzo a caer, me detengo yo sola.”

Inclusive Norman, a sus 88 años, que gruñía cada vez que su esposa lo obligaba a asistir a las clases de fitness, observó notables mejoras en su movilidad.

En al menos una ocasión, Norman abandonó su andadera y tomó las escaleras.

“¿Qué haces?” una sorprendida Fowlkes le pregunto con sorpresa y escepticismo cuando lo vio en las escaleras.

Ella estaba preocupada por su seguridad.

“Norman no había caminado por las escaleras antes,” Fowlkes enfatizó.

Pero Norman estaba seguro y confiado. El se había haciendo ejercicio.

La pareja Johnson está entre los varios residentes de Hidden Lakes que han mejorado su fuerza, equilibrio, movilidad y flexibilidad desde que las clases de fitness de 30 minutos iniciaron en Octubre 1, 2014.

Hay una mujer que puede ponerse su abrigo sin ayuda y otra que puede meterse y salir de automóviles por ella misma.

“Definitivamente he observado una gran diferencia,” Fowlkes dijo.

Esa diferencia es Andy Bolliger, dueño de CrossFit Salem. Durante su tiempo en Hidden Lakes, el ha venido a desarrollar un programa de ejercicio adaptado a los de más edad.

Aquellos que asisten a la clase de fitness de 30 minutos dicen haber visto mejora en fuerza, flexibilidad, movilidad y equilibrio.

Las damas de esta clase en Hidden Lakes completaron juntas Grace en menos de 5 minutos.

"Es el mejor programa (para adultos mayores) programa que he visto ... hasta donde se," dijo Fowlkes, quien ha trabajado en el negocio de residencias para el adulto mayor por 17 años.

Ella agrego: "El definitivamente entiende lo que los residentes necesitan."

LLENO DE GRACIA

El anuncio se oía á traves del sistema de audio de la comunidad: "Ejercicio con Andrew" inicia a las 10 a.m. en el salón de baile.

Siete mujeres de edad avanzada aparecieron, tomando rumbo hacia el casillero en el rincón del cuarto. De ahi, ellas tomaron mancuernas cubiertas de neopreno—ninguna más de 5 lb.—y bandas de resistencia. Ellas colocaron el equipo en el piso de madera cerca de las sillas acomodadas en un patrón circular y dieron su atención a Bolliger. El se paró dentro del circulo y comenzó a dirigir.

Primero hubieron rotaciones del cuello. Después encogimientos de hombros. Para romper el hielo, el les pidió que dijeran sus nombres y el carro favorito que hayan tenido.

"Yo voy a comenzar. Mi nombre es Andy y mi carro favorito ... fué mi Volkswagen Rabbit."

Hubieron Buicks. Y muchos Cadillacs.

Continuando con su calentamiento, Bollinger las dirigió á traves de balanceos de los brazos, balanceos de las piernas mientras se sostenían de su silla y estiramientos de pantorrillas, después las hizo completar sentadillas simplemente sentándose en sus sillas y poniéndose de pie. Repetidamente.

"¿Cuántas fueron? ¿Tres?" Bollinger pregunto en forma de broma.

"Nueve," Kay Weber, de 83 años, dijo enfáticamente con una gran sonrisa.

Las bandas de resistencia vinieron después. Con estas en las manos, las mujeres establecieron un agarre amplio sobre la cabeza para hacer unos pases para los hombros y después intentar separar la banda con las manos para estirar.

"Traten de no golpear a nadie," les advirtió Bollinger. "Incluso si se lo merecen."

Después era tiempo para las mancuernas.

Primero hubieron empujes, después envión y empuje con las mancuernas empezando a los lados mientras ellas estaban de pie.

"Lleva los codos a (tus) costados, después arriba hacia los hombros," Bollinger les dijo.

Las damas completaron varías repeticiones.

"¿Qué es lo que estamos tratando de lograr? ¿Alguien recuerda?" el preguntó.

Jeanette Knapp fué la más rápida en responder.

"Uh, Grace," dijo la mujer de 84 años.

Eso es correcto: Este grupo de mujeres, todas de más de 75 años, estaban calentando para un entrenamiento benchmark de CrossFit: 30 envión y empujes de envión por tiempo.

Pero primero, Bolliger las instruyó en el peso muerto, enfatizando en la espalda derecha. Ellas intentaron imitar este movimiento, sin embargo unas eran fisicamente incapaces.

Este grupo de mujeres, todas de más de 75 años, estaban calentando para un entrenamiento benchmark de CrossFit: 30 envión y empujes de envión por tiempo.

Finalmente, llegó el momento.

Después de meses de las clases de fitness de Andy Bolliger, Dolores Benett puede levantarse de la silla sin utilizar sus manos.

Sincronizadas, con mancuernas en mano, ellas contaron en voz alta todos los 30 envión y empujes de envión. Tocaron el suelo con sus mancuernas azules cielo, rosadas y moradas, se pararon y las presionaron sobre la cabeza.

"Tu definitivamente necesitas mancuernas más pesadas, Helen," Bolliger le dijo a una de las mujeres parada directamente enfrente de el cuando inició el entrenamiento.

"¡Estas son de 2!" ella contestó con los ojos bien abiertos.

Mientras continuaban, Binky Mitchell, de 77 años, se dio cuenta de algo.

"Es casi más fácil ir más rápido," ella observó.

"Me gusta como estas pensando," respondió Bolliger con una sonrisa.

Después de la repetición final, las damas se veían satisfechas con ellas mismas, sonriendo una a otra. Hasta hubieron algunos aplausos. De forma colectiva al grupo de nueve les tomó justo debajo de los cinco minutos completar Grace.

Con tres minutos para calmarse, Bolliger hizo que las damas caminaran alrededor del cuarto mientras sostenían sus mancuernas a los costados. Después, en la marca de 10:30, se fueron directamente a su estudio de la Biblia.

"Nunca pensé que iba a hacer esto a los 96," Vi Carter dijo mientras caminaba hacia el casillero para guardar su equipo.

Carter ha vivido en Hidden Lakes por cinco años y empezó a asistir a las clases de Bolliger tan pronto como las ofrecieron.

"Pienso que simplemente es lo correcto," dijo sonriendo. "Nos despierta."

EL ANIMADOR

Por años, Bolliger había querido iniciar un programa de adultos mayores en CrossFit Salem.

Pero cuando agregó un par de clases para adultos mayores en el programa del afiliado en el 2010, obtuvo "casi cero participación."

"Me desmotive por que para un par de personas que expresaron interés, el precio era una barrera," Bolliger explicó. "Para las personas de esa edad entrenar es un concepto extraño."

Tres años después, sin embargo, sus habilidades fueron puestas a prueba después de que su padre de 79 años se cayó de un árbol al estarlo podando. El doctor recomendó terapia física. El papa de Bolliger también asistió a CrossFit Salem para tratar de recuperar simples habilidades físicas, tales como pararse en una pierna, a través de sesiones uno a uno con su hijo.

"No podía creer la mala condición física que tenía," Bolliger dijo de su padre. "No podía hacer una push-up—ni siquiera en sus rodillas."

Cuando recién llego, el veterano del ejército de los Estados Unidos apenas podía hacer una sit-up, y hacer sentadillas estaba fuera de cuestión.

"Esos elementos básicos en CrossFit que usamos y luego incrementamos su dificultad, no podía realizarlos sin asistencia importante."

Pero después de alrededor de tres meses, el papá de Bolliger era capaz de equilibrarse en un pie por 20 segundos a la vez y realizar sentadillas sin asistencia. Y podía hacer push-ups en sus rodillas. Esta experiencia reforzó la confianza de Bollinger en su habilidad de entrenar a personas de mayor edad.

"Debe haber reforzado en mi mente que yo podía hacerlo y eso fue probablemente la primera vez que entrené a alguien de más de 70," explicó.

Su siguiente trabajo iría más allá para probar su talento.

Fué en Septiembre 2014. Bolliger estaba hojeando Craigslist como comúnmente hacía.

"Al azar de vez en cuando, navego, surfeo la web, reviso los trabajos en la sección de fitness para ver que esta pasando en nuestra comunidad," el dijo.

Ahí es cuando lo vio: un anuncio de trabajo para un instructor de ejercicio para adultos mayores en Hidden Lakes, 1.5 millas al oeste de CrossFit Salem.

Bolliger saltó hacia la oportunidad.

Respondió a la publicación y terminó al teléfono con Fowlkes, quien eventualmente explicó que la clase de fitness entraba dentro del presupuesto del centro destinado para entretenimiento.

"No soy tanto un animador," el le dijo, "pero conduzco una clase de fitness."

La esposa de Andy Bolliger, Carol, dijo que la pasión de su esposo es mejorar el fitness de todas las personas sin importar su edad.

Andy Bolliger dirige su clase de fitness en la comunidad de adultos mayores en Hidden Lakes a través de un extenso calentamiento.

Bollinger es entrenador de CrossFit Nivel 1 con cursos adicionales de CrossFit Gimnasia, Powerlifting y Levantamiento de Pesas. Fowlkes no estaba convencida. Ella le pidió que fuera a dar una clase de prueba.

"Estaba muy escéptica," ella dijo. "El dió una clase gratis ... para mostrarme lo que podía hacer."

Enseguida, Fowlkes supo que Bollinger era la elección correcta.

"Solo la forma en que el era con las personas mayores—paciente, los hacia reír, los logro involucrar," ella explicó.

Lo que inicialmente se pensaba que sería media hora de entretenimiento de los residentes vino a ser más.

"Esencialmente estoy haciendo movimientos básicos de CrossFit al grado de su habilidad," Bollinger dijo.

El agregó: "Hacemos sentadillas todos los días porque ellos lo necesitan terriblemente y su capacidad de moverse depende de la fuerza de sus piernas. Las sentadillas son el enfoque de nuestro programa y de ahí vamos a lo demás."

Además, hay los pesos muerto y empujes.

"Vamos a través de una gran variedad de movimientos con su propio cuerpo," Bolliger dijo. "Trato de mantener la variedad así ellos no se aburren."

Incluso los Levantamientos Turcos sin peso aparecieron una vez después de que una residente pidió ayuda en como bajar al piso y ponerse de pie de vuelta.

"Yo solo intente simplificarlo paso a paso—coloca tu pierna aquí, tus brazos aquí," el dijo.

El ejercicio, Fowlkes notó, es un elemento importante para mantener a los adultos mayores activos.

"El se enfoca en las cosas que los mantiene saludables y equilibrados."

EL HOMBRE DE LAS DAMAS

Pocos atletas en CrossFit Salem saben que Bolliger—padre de cuatro, tres de ellos trillizos—invierte tiempo enseñando fitness en una comunidad de retiro. El no es mucho de decir sus propias cosas, dijo su esposa, Carol. Después de su experiencia con su papá, Bolliger se dio cuenta de que los adultos mayores eran parte de una población que necesitaban atención, ella dijo.

"No es precisamente su misión, su pasión. El vio una necesidad y estaba buscando como arreglarla," Carol explicó. "Su pasión, en general, es el fitness para todos—ya sea que tengas 8 o 80 años."

Aunque ella nunca ha ido a Hidden Lakes para ver a su esposo en acción, Carol bromeando agregó con una sonrisa, "El me dice ... las viejitas lo adoran."

Ella podría estar en lo cierto.

"El nos reta. Es paciente. Reconoce nuestras limitaciones," Dolores Bennett dijo de Bolliger.

Después de meses de asistir a las clases en Hidden Lakes, la de 85 años de edad dijo que su equilibrio ha mejorado.

> "El nos reta. Es paciente. Reconoce nuestras limitaciones."
> —Dolores Bennett, 85

"No tengo que usar mis manos para pararme de la silla para nada. Yo solo pienso que el hace un buen trabajo."

Lily Van Someren dijo que ha notado mejora en su flexibilidad.

"Todos nosotros estamos llegando a esa edad," dijo la de 90 años, luego se rió.

Ella agregó: "De verdad pienso que es bueno para nosotros. Te mantiene moviéndote, te presiona un poco. Y a el le importamos. Se que si."

Virginia Hinson, 86, utiliza una banda de estiramiento mientras sigue las indicaciones de Andy Bolliger durante le entrada en calor.

Además, la clase de Bolliger es mejor que ver el video de ejercicio el Miércoles por la mañana, Weber dijo.

“Me gusta la forma como el lo hace. Usamos pesos y bandas elásticas y cosas diferentes. Lo disfruto.”

Frances Sitko, sin embargo, puede que sea una venta más difícil.

“Hay demasiadas sentadillas,” dijo la de 97 años de edad, la cual es ciega de su ojo derecho.

Aún así, concedió: “Ciertamente es mucho mejor que nada en lo absoluto.”

Van Someren ofreció una perspectiva diferente.

“Algunos dicen, ‘El te presiona demasiado.’ Bueno, el nos presiona, pero lo necesitamos, y el te dice, ‘No vayas más lejos de lo que crees que deberías.’”

Ella continuó: “Y eso nos hace acercarnos unos a otros.”

EXPANDIENDO LA VISIÓN

Con el éxito de las clases en Hidden Lakes, Fowlkes le ha pedido a Bolliger que enseñe otra clase en Madrona Hills. La comunidad de adultos mayores está ubicada a menos de media milla de distancia de Hidden Lakes, y Bolliger empezará a enseñar una clase a la semana ahí en Agosto. Ahora, el esta en Hidden Lakes al menos una vez por semana; cada dos semanas el enseña dos clases.

Fowlkes dijo que cree que el ejercicio es importante para los residentes “para un bienestar total.”

“Si no lo usas, vas a perderlo,” ella explicó.

De su parte, Bollinger quiere ir aun más allá con sus clases.

Está en conversaciones con Holiday Retirement en Oregon, dueño de Hidden Lakes y Madrona Hills, para expandir el programa a todas las 306 comunidades a lo largo de los Estados Unidos. Holiday Retirement es uno de los mas grandes residenciales para adultos mayores en el país, de acuerdo con su sitio web.

No se ha materializado nada formal, pero Bollinger esta motivado por sus conversaciones con un representante del corporativo.

“Ellos mostraron interés en tomar este modelo y crear algo que puedan utilizar en todas sus instalaciones,” el dijo.

La idea de Bolliger es emparejar a cada comunidad de Holiday Retirement con un afiliado local de CrossFit que utilizaría el modelo que el creó como un mapa para llevar a cabo sus propias clases de fitness.

“Creo que es una gran idea,” Fowlkes dijo.

Ella agregó: “Las oportunidades para él de construir un programa para nuestra compañía son grandes.”

En una forma clásica de CrossFit, Bollinger dijo que quiere romper nociónes tradicionales que tiene la sociedad de que tan activos deberían ser los adultos mayores.

“Se asume que ellos solo se sientan en el sofá. Se asume que todo es muy peligroso,” el dijo. “Yo trato de decirles, ‘Saben, toda la asistencia, barras, todas esas cosas que están ahí para mantenerlos seguros, es grandioso, pero no las usen a menos de que las necesiten.”

Mejorar la calidad de vida es lo que Bolliger dijo que se ve haciendo en Hidden Lakes y Madrona Hills.

“Hasta donde se, soy la única persona en sus vidas diciendo, ‘Oye, mejoremos las cosas.’ Eso es especial para mi. Realmente me importa mejorar sus vidas—no sólo sobrevivir.”

ACERCA DEL AUTOR

Andréa María Cecil es asistente de manejo de edición y escritora principal del CrossFit Journal.

THE CrossFit JOURNAL

DISSECTING THE SQUAT

BY ZACHARY LONG

Zachary Long details three tests that will help you determine whether mobility or motor control is derailing your squat.

The general set-up position for an air squat as demonstrated by CrossFit Inc. Seminar Staff.

A solid air squat provides the foundation for variations including the back squat, front squat and overhead squat.

The squat is an essential movement pattern, but many lose the ability to perform a proper squat over time, and the movement must be retrained to allow them to perform daily activities such as standing from a seated position.

In the world of athletic development, the squat is the most important exercise for developing powerful hip extension, and thus it is one of the best exercises for improving athleticism. In the CrossFit Level 1 Certificate Course, the air squat is the foundation on which the squat is developed into higher-level training tools such as the back squat, front squat and overhead squat, with the latter two variations key to the Olympic lifts.

Performing a proper squat requires significant mobility throughout the body, but the ability to move all the involved joints through their available ranges of motion does not necessarily ensure a perfect squat. The squat also requires considerable motor control, meaning the athlete must be able to efficiently utilize his or her available motion through proper muscle activation. While mobility is often blamed for poor movement, motor control is just as important. A thorough understanding of the mobility and motor-control needs of the squat will help athletes and coaches choose the best corrective exercises to optimize performance of this essential functional movement.

Points of Performance

The CrossFit Level 1 Certificate Course provides the superior framework for learning the instruction and performance of the squat through both lectures and hands-on group coaching. The points of performance taught in the course ensure that athletes perform the squat with sound mechanics.

In the set-up, the athlete should have a shoulder width-stance with knees and hips fully extended and his or her weight on the heels. The athlete maintains a braced core with the chest up to position the spine in neutral. To execute the movement, the athlete begins by moving his or her hips down and back (versus moving the knees forward). The athlete descends until the hip crease is below the kneecap while keeping the knees over the feet and the spine in a neutral position. The movement is finished when the athlete returns to the full upright position with the hips and knees extended (3).

Common faults during the squat include loss of neutral spine, shifting of weight onto the toes, loss of contact between heels and ground, outward rotation of the feet during performance of the squat, lack of squat depth and improper lateral tracking of the knee (3). The “CrossFit Level 1 Training Guide” provides multiple corrective exercises and cues for improving these faults.

Mobility Requirements for the Squat

When determining whether performance is limited by mobility or motor-control issues, begin by analyzing mobility. If adequate mobility is present in all necessary joints but movement quality is below standards, motor-control imbalances are to blame.

If adequate mobility is present in all necessary joints but movement quality is below standards, motor-control imbalances are to blame.

The first place to start when analyzing mobility for the squat is the ankle. Lack of ankle dorsiflexion is one of the most common range-of-motion limitations seen in athletes and can cause all the faults listed above. Limited ankle dorsiflexion has been shown in multiple research studies to cause movement faults during other activities such as jumping. This research has also correlated limited ankle mobility with a variety of lower-extremity injuries (2,4,5). Thus, addressing ankle mobility is necessary for optimizing movement quality.

To test ankle mobility, position the big toe of the ankle to be tested one hand width away from a wall with the foot pointed forward. On average, the foot tends to be approximately 4 inches from the wall. While barefoot in the bottom position of a lunge, the athlete should be able to touch the kneecap to the wall without the heel’s rising off the ground. If the athlete cannot do so, ankle dorsiflexion is limited.

To assess if sufficient knee flexion is present to squat to depth, the athlete should lie on his or her back and bend the knee to the point where the calf muscles make contact with the posterior thigh. Hip-flexion is tested in the same position as the athlete pulls the thigh toward the chest. If the front of the thigh contacts the stomach, adequate hip flexion is present (1).

If these three tests are passed, the athlete has sufficient lower-body range of motion to perform a squat while maintaining all points of performance outlined in the "CrossFit Level 1 Training Guide." While other mobility testing will be proposed, the vast majority of athletes who have passed these first three tests but demonstrate improper squat form do so because of motor-control dysfunctions rather than mobility restrictions. Interventions such as "squat therapy"—as proposed in the "Training Guide" and discussed below—will help these athletes improve their mechanics.

To assess hip rotation, the athlete should sit on a box with an upright torso. A partner rotates one leg so the foot goes inward for external rotation and outward for internal rotation. The partner must also ensure that the thigh remains pointed directly forward and that motion is stopped before the pelvis begins to shift. Normal range of motion for both internal and external rotation should be approximately 40 degrees.

Limitations in either direction of hip rotation will result in a variety of compensations during the squat and other athletic movements. Common squat compensations include outward turning of the feet during execution of the squat, loss of neutral spinal positioning, and excessive outward movement of the knees beyond the width of the feet. Therefore, optimizing hip mobility is necessary in developing overall athleticism.

It is important to note that hip anatomy varies greatly in individuals. For some, this suggested hip-rotation mobility may not be possible, but even small improvements can have significant effects on improving performance and function. For an in-depth look at hip anatomy and function during athletics, read the CrossFit Journal article "The Hip and Athletic tPerformance."

When mobility restrictions are present, a variety of techniques can be employed to improve range of motion, including stretching, myofascial release, joint mobilizations and manual therapy performed by trained professionals. Mobility improvement is a broad topic, with individual response varying greatly. Recommended resources for potential mobility exercises can be found at the end of this article.

To assess range of motion in lumbar-spine extension, have the athlete lie prone. The athlete should then prop the upper body onto his or her forearms. Uniform extension through the lumbar spine should be seen with the athlete's hips flat on the ground. In those with dysfunctional lumbar-spine extension, the hips will rise off the ground or the athlete will be seen exhibiting excessive extension at one spinal segment (often at the junction between the lumbar and thoracic spine).

Courtesy of Zachary Long

If an athlete can keep the heel to the floor and touch his or her kneecap to a wall when the big toe is one hand width away from it, he or she has optimal ankle mobility for squatting.

Courtesy of Zachary Long

Assessment of knee-flexion range of motion. To assess hip flexion, the athlete would pull the thigh toward the chest.

Thoracic-spine extension and shoulder mobility have been previously discussed in "Analyzing the Handstand Position." Thoracic-spine extension is important in all squat variations, and shoulder mobility and stability become increasingly important in the overhead squat. To better understand the demands on the shoulder in CrossFit, see "The Optimal Shoulder" in the CrossFit Journal.

Motor Control of the Squat

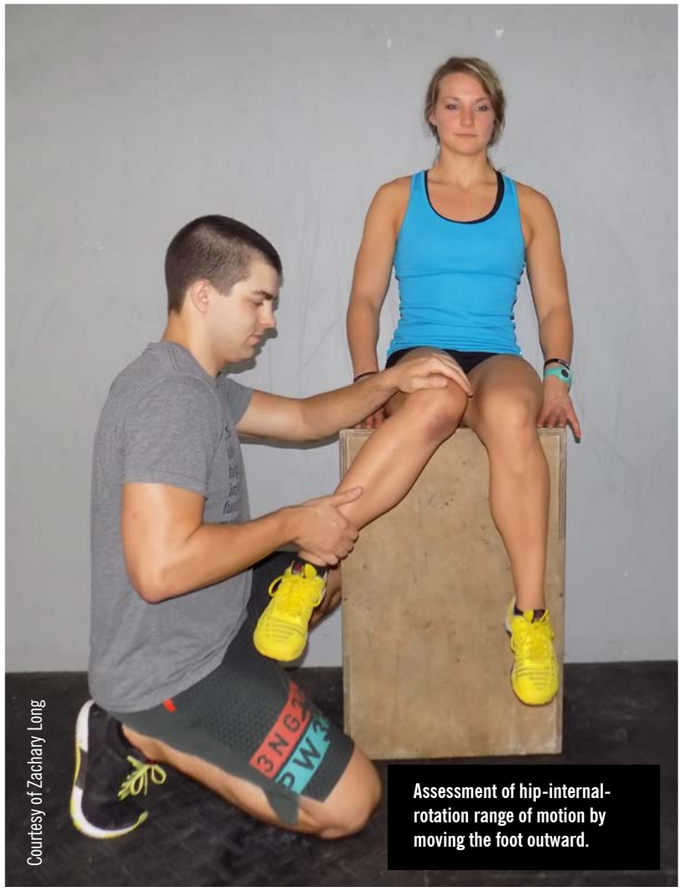
As previously discussed, when an athlete has proper mobility but squat performance is dysfunctional, motor-control issues are present; that is, the individual is unable to properly coordinate muscle activation to control movement through the available ranges of motion to properly perform a squat. Verbal, visual and tactile cues should be employed to improve mechanics in athletes whose squat mechanics are limited by motor control.

While it's common for athletes to believe their squat errors are solely related to range-of-motion issues, many errors are caused by motor control. Trainers will often present a cue only to have an athlete say "I can't" before he or she details a perceived range-of-motion issue. In some cases, range of motion is indeed limited, but in other cases the faults are caused by motor control. Either way, relentless trainers can almost always make smaller improvements in the short term simply by using creative cues to improve motor control.

Relentless trainers can almost always make smaller improvements in the short term simply by using creative cues to improve motor control.

Inward tracking of the knees is one of the most common movement faults that results from a lack of motor control. While the fault might be caused by limited ankle mobility, it is usually the result of a lack of activation of the gluteal muscles to control lateral movement of the knee. Verbal cues such as "push the knees out" or "spread the ground with you feet" can be employed to remedy this fault.

In others cases, an external target such as a coach's hand near the athlete's knee will produce better results (3). A resistance band around the athlete's knees can also make for a great



Courtesy of Zachary Long

Assessment of hip-internal-rotation range of motion by moving the foot outward.

Courtesy of Zachary Long

Positioning a light resistance band around an athlete's knees makes a great tactile cue for proper positioning during a squat.

external cue for use in correcting the knees-in fault. The band should be of light resistance, as it is used as a device to improve gluteal activation rather than to improve strength via loading (1). A great combined approach to this problem would be having the athlete perform squats with a resistance band during warm-up, with the coach cueing for correction during workouts.

A second common motor-control dysfunction is loss of neutral spinal positioning into lumbar flexion. This can often be corrected by cueing the athlete to lift the chest or raise the arms during descent into the squat (3).

For others, their static positioning during the set-up of the squat will put them in a disadvantageous position for maintaining proper spinal alignment. If an athlete begins with the lumbar spine overextended, the pelvis will be tilted anteriorly, decreasing the hip-socket range of motion available for the hip to move into flexion. As the athlete descends, the lumbar spine will have to move into flexion to allow for depth to be reached. This is commonly referred to as a "butt wink" when seen while squatting. Some athletes with sufficient hip mobility are fooled into thinking range of motion is lacking simply due to poor set-up in the squat. These athletes should be instructed in proper positioning before descending into the squat. Cues such as "keep your ribcage down" will often get the athlete to engage the abdominals and glutes to assume a more neutral position.

Similarly, many athletes initially struggle with balance during a squat, resulting in faults such as loss of neutral spine, weight shift onto the toes, excessive anterior knee movement and lack of depth during the squat. Much like a building, the weight must be distributed properly in the foundation or errors appear above. As with poor pelvic orientation in the set-up, poor weight distribution places athletes in positions that appear to be caused by limited mobility.

For some, a cue to push the hips down and back while keeping weight on the heels will assist in correction. For others, the use of a weight to provide a counterbalance will help the athlete learn proper positioning. This can be performed by holding a kettlebell in a goblet-squat position or by holding a light plate out in front of the chest. As the athlete learns proper positioning, the weight can be reduced or eliminated entirely to provide less counterbalance assistance. The weight will allow the quadriceps-dominant athlete to send the hips back—rather than the knees forward—to better load the hips without loss of balance.

Unlike mobility issues, motor-control issues can often be quickly remedied with proper corrective strategies and cues.

The squat-therapy corrective exercise taught in the CrossFit Level 1 Certificate Course is a fantastic tool for addressing all the most common mechanical errors, and it's a great starting point for an athlete who demonstrates multiple squat faults. To perform squat therapy, the athlete stands facing a wall in a proper set-up position. He or she then squats to a 10-inch box or other low target such as a medicine ball. The squat is performed slowly with the coach carefully watching and providing appropriate cueing throughout the movement (3).

The box provides a tactile target to ensure proper depth. Additionally, the wall forces the athlete to avoid excessive forward movement of the knees and trunk. Drastic mechanical improvements are often seen when a coach's cueing is combined with an athlete's conscious effort to keep the weight on the heels and the chest upright.

Unlike mobility issues, motor-control issues can often be quickly remedied with proper corrective strategies and cues. With consistent practice of movements using proper technique, these corrected patterns will ultimately become an athlete's default mechanics. As an athlete's motor control improves, his or her ability to properly load joints and muscles will be enhanced, and more efficient movement patterns will translate into improved performance during other athletic movements.

Evaluate and Improve

The squat is a fundamental movement pattern required for remaining functionally independent as one ages and for developing athleticism. Determining if squat dysfunctions come from range-of-motion or motor-control imbalances will help coaches and athletes find better corrective cues and exercises to more quickly optimize the athlete's performance and ensure safety. ■

Holding a plate in front of the chest provides a counterweight that often helps the athlete learn proper balance and squat positioning.

Christopher Nolan/CrossFit Journal

Christopher Nolan/CrossFit Journal

Squat therapy is a powerful coaching tool for improving squat mechanics in an athlete with multiple faults.

Resources for the Fitness Athlete

Fitness Pain Free
The Hybrid Perspective
The Barbell Physio
Mobility 101
The Movement Fix
MobilityWod
The Wod Doc

References

1. Cook G, Burton L, Kiesel K, Rose G, and Bryant MF. *Movement: Functional Movement Systems: Screening, Assessment and Corrective Strategies.* Santa Cruz, Calif.: On Target Publications, 2010.

2. Fong CM, Blackburn JT, Norcross MF, McGrath M, Padua DA. Ankle-dorsiflexion range of motion and landing biomechanics. *Journal of Athletic Training* 46(1): 5-10, 2011.

3. Glassman G and Staff. CrossFit Level 1 Training Guide. May 15, 2010. Available at http://journal.crossfit.com/2010/05/crossfit-level-1-training-guide.tpl.Accessed Oct. 6, 2015.

4. Macrum E, Bell DR, Boling M, Lewek M, and Padua D. Effect of limiting ankle-dorsiflexion range of motion on lower extremity kinematics and muscle-activation patterns during a squat. *Journal of Sport Rehabilitation* 21: 144-150, 2012.

5. Whitting JW, Steel JR, McGhee DE, and Munro BJ. Dorsiflexion capacity affects Achilles tendon loading during drop landings. *Medicine and Science in Sports and Exercise* 43(4): 706-713, 2011.

About the Author

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THE CrossFit JOURNAL

NEVER MISS THE JERK

BY ANDRÉA MARIA CECIL

Affiliate owners work to please every client, but when an athlete is clearly unsuited to a gym, it's time to take action.

Mike Warkentin/CrossFit Journal

Judith Armstrong

Peter Haas (right) of CrossFit Downtown Winston said he stays vigilant to ensure his members buy into his vision of community.

Doug Chapman has seen it all: stalking, rudeness, willful ignorance.

There are many reasons he's asked clients to leave his affiliate, CrossFit Ann Arbor in Michigan. And since opening the gym in 2005, he's come to recognize the red flags early.

"When they're noncompliant for instruction to a class," Chapman said dryly. "Basically you know when you're organizing a class … and somebody's off doing their own thing, talking—it's disrespectful."

He added: "It basically detracts from the class, the learning process for everybody."

When newcomers arrive, Chapman advises his team of coaches to vet them for a good fit.

"People come in with all kinds of goals and ideas of what they expect, but if it doesn't match, you need to redirect them away from you," he advised.

It's something nearly every affiliate owner has encountered: Firing a client. Although unpleasant, owners said, it's necessary for the vitality of your box.

"I hate to see money walk out the door, but I had some people I got rid of in the winter time and I'm just so happy that their negativity is out of my gym," Chapman said. "Your company is essentially what you are. If we're not all going in the same direction, get off the bus."

Warning Signs

He calls them "The Gamers"— athletes focused on competition.

"They want the special treatment," said Kris Caswell, owner of CrossFit Ambition in New York.

In particular, he recalled one athlete—decent, but not great—who wanted to qualify for the CrossFit Games.

"It's hard to tell someone, 'You're not going to the CrossFit Games,'" Caswell recounted.

Caswell pointed him toward local competitions and gave him additional programming.

"Then, at some point, this athlete was all of a sudden going from around the top of the whiteboard to right at the top of the whiteboard."

It turned out he was cheating. On one occasion, the athlete padded his Fight Gone Bad score with 30 reps he didn't perform, Caswell said.

"Every workout, I counted. Still wrong. Still wrong."

When Caswell would confront the athlete about it, the response was nearly always the same: "Oh, I'm sorry. I'll redo the workout."

He wasn't just dishonest. He and The Gamers did separate workouts during class time and interrupted Caswell while he was coaching others to ask him questions about their programming.

Eventually, The Gamers left CrossFit Ambition.

"They decided to leave on their own after I stopped giving them programming and extra attention," Caswell said.

He felt disappointed but not regretful.

"They're not my moneymakers for my gym, and they're consuming a lot of my time."

For Peter Haas, the biggest red flag is an athlete's disconnecting from the community, becoming "uncoachable."

"Don't be a prima donna. Don't be a special snowflake," said the owner of CrossFit Downtown Winston in North Carolina. "What makes you so much more important than this community that you're coming into and I'm trying to take care of?"

> "What makes you so much more important than this community that you're coming into?"
>
> —Peter Haas

As an affiliate owner, Haas said he's constantly trying to create his perfect world.

"If that person's not really fitting into it and they're compromising that, then we need to have a conversation."

At CrossFit Rochester in New York, owner Joe Celso has handled a few members who didn't seem to like his programming.

"One lady—she was constantly stepping up, 'We should be doing this,' 'We shouldn't do that' and constantly questioning," Celso remembered.

One day, he'd had enough and told her so during a group class.

"'At the end of the day, this is what we're doing, and if you don't like it, you won't work out here,'" Celso recalled telling her. "She came back the very next day and apologized."

Although the indicators aren't always so obvious, Jocelyn Rylee said when you know, you know.

"If I consistently see someone who signed in and I'm kind of like, 'Ugh,' that's the first sign," said the owner of CrossFit Brio in Canada.

Emma Love

Jocelyn Rylee of CrossFit Brio said a bad member who poisons the atmosphere is simply not worth his or her membership fee.

Action Plan

Affiliate owners said they've learned their lessons over the years. These days, they handle problem clients before they become problem clients.

Celso has prospective new members do a one-week free trial. Caswell borrowed a page from CrossFit VB in Virginia with a so-called "no-asshole clause" included in his waiver. Haas has an earnest talk the moment the athlete enters the premises. And Rylee schools members on the gym's two principles: The Bill and Ted Principle—be excellent to each other—and The Grandma Principle—make good choices.

"Anybody we'd ever had to ask to leave, they haven't followed one of those two (principles)," Rylee noted.

If you end up with a jerk at your gym, affiliate owners had the same advice: Handle the problem right away.

"Set expectations early and own your box," Celso advised. "You gotta be the owner of it and that's really it. You can't be afraid to tell people when they're wrong or whether they're off base or whether you think they're being disruptive."

He continued: "I don't care how much you think you need a customer, if it's the wrong customer, it's the wrong customer. It's not a retail thing. You're developing relationships with these people. Be the owner. Stand your ground."

Haas takes a two-part approach: the come-to-Jesus talk, which he also calls Dr. Jekyll, and the follow-up conversation—Mr. Hyde.

"You're trying to change this situation. You're trying to help them. You're trying to coach them," he explained. "If you go from there and everything changes … beautiful. We're great. If it doesn't, that's where (Mr. Hyde) comes in."

It's never worth it to tolerate a negative person, Haas added.

"If you are just sitting there and you are obviously just taking shit from this person and other people are seeing that, that just undermines your entire process," he said. "You need to be confident with what you do as a coach, what you offer, how you help people, how you change people's lives. … If this person is not a good fit, then I need to go out and find other people who are a good fit."

Rylee said it more plainly.

"I don't need your $150 a month to put up with you."

Her advice?

"Be really careful to pick out those bad apples or try to deal with them," she said. "It doesn't take more than one person being really negative to set the whole vibe of everyone being very negative."

Or worse: A prospective new member never returns because of one jerk.

"Others will leave because people are douchebags," Chapman said. "Don't serve them. Discrimination applies to race, sexual orientation, everything like that; it doesn't apply to douche or not." ■

About the Author

Andréa Maria Cecil is assistant managing editor and head writer of the CrossFit Journal.

THE CrossFit JOURNAL

FRAILTY, THY NAME IS WOMAN?

BY HILARY ACHAUER

In CrossFit gyms around the world, women deconstruct the longstanding myth of "the weaker sex" and continue the march toward true equality.

Thomas Campitelli/CrossFit Journal

In 1973, 55-year-old Bobby Riggs—the 1939 Wimbledon champion—challenged 29-year-old Billie Jean King to a tennis match. Riggs said he could beat any female player even though he was in his 50s.

King refused at first, so Riggs began baiting King, daring her to play him. In July of '73, King finally agreed to a US$100,000 winner-take-all match, with an additional $75,000 for each player in ancillary money. The tennis match, dubbed "The Battle of the Sexes," took place in front of a crowd of 30,492; an estimated 90 million people watched it on TV.

"I'll tell you why I'll win," Riggs said. "She's a woman, and they don't have the emotional stability. Women play about 25 percent as good as men, so they should get about 25 percent of the money men get."

Although the odds favored Riggs going into the match, King dominated from the beginning. She won all three sets—6-4, 6-3, 6-3—and threw her racket in the air when the match ended.

"I thought it would set us back 50 years if I didn't win that match," she said afterward. "It would ruin the women's tour and affect all women's self-esteem."

Women's equality had a long way to go in 1973. Most women could not obtain a credit card, and if they did, it was because of a man's signature. Second-wave feminism was just gathering steam, with the goal of changing the commonly held belief that women's biological differences from men made them intellectually inferior, more emotional and best suited for domestic life.

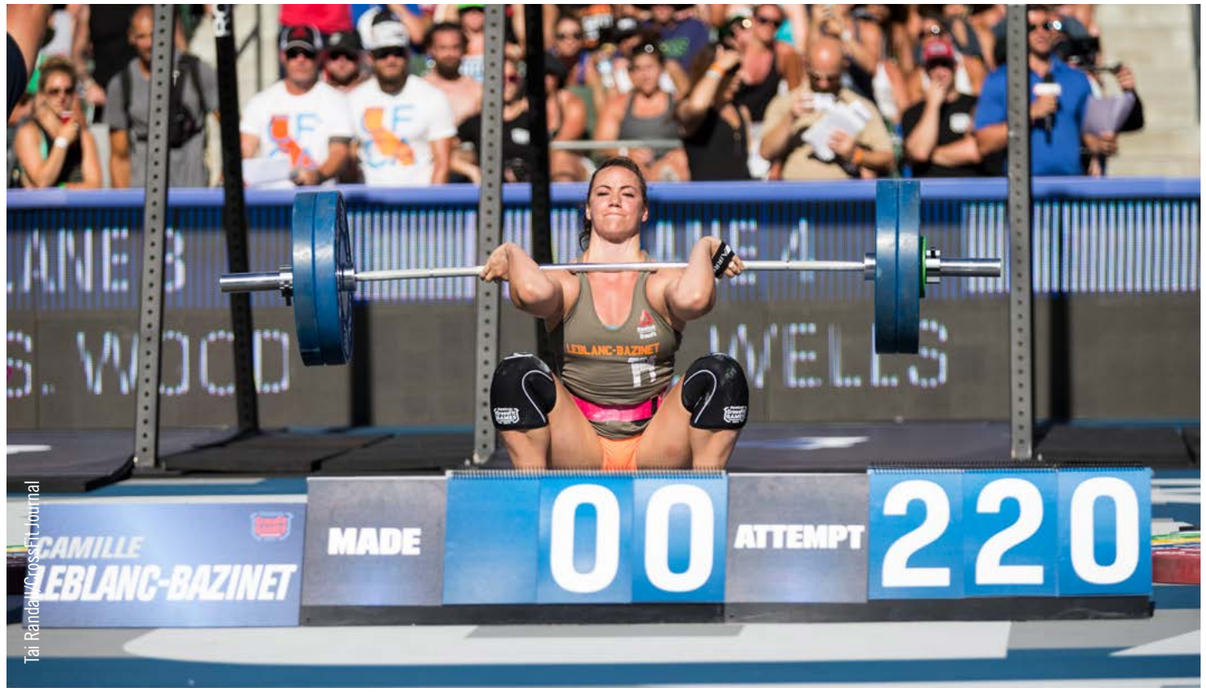
Throughout history, people have used the argument that women are weaker than men to hold them back from physically demanding jobs in the military, police forces or firefighting departments. That's changing.

In August 2015, two women graduated from U.S. Army Ranger School, one of the most grueling training programs in the military. These women met the same tough physical standards as the men and were the first females to complete the program.

The realization that strength is a social construct might be the hallmark of feminism in the 2000s. The worldwide influence of CrossFit—from the affiliate level to the CrossFit Games—has played a role in this shift, helping to destroy the idea that women are the weaker sex.

Equality in CrossFit: Male and female CrossFit Games champions receive the exact same prize money.

Ruby Wolff/CrossFit Journal



Tai Randall/CrossFit Journal

Men generally carry more muscle mass and post greater lifting numbers, but pound-for-pound comparisons reveal women are not actually "weaker" in terms of physiology.

The Socialization of Strength

For much of its history, the feminist movement has focused on institutional, social and cultural equality.

"Most feminists have not encouraged the development of physical power in women," Amanda Roth and Susan Basow wrote in a 2004 article titled "Femininity, Sports, and Feminism: Developing a Theory of Physical Liberation," published in the Journal of Sport & Social Issues (3).

Still, Roth and Basow point out that "the strongest women are stronger than the weakest men in the same way that the tallest women are taller than the shortest men in terms of percentages."

But in CrossFit gyms in which women are encouraged to lift heavy just like the men, the percentages might be even higher. On whiteboards in affiliates all over the world, women regularly post impressive strength numbers that put them ahead of many male members.

In affiliates all over the world, women regularly post impressive strength numbers that put them ahead of many male members.

In her 2000 book "The Frailty Myth: Women Approaching Physical Equality," Colette Dowling attempted to dispel the myth that women are substantially weaker than men.

Dowling wrote that the myth of female frailty has roots in 19th-century medicine, and it's had lasting, damaging effects on the perception of women's strength (2). But are women actually weaker in terms of physiology or have they just stayed out of the weight room because lifting heavy "isn't ladylike"?

Patty Freedson wrote a chapter titled "Muscle Strength and Endurance" in the 1994 book "Women and Sport: Interdisciplinary Perspectives" edited by D. Margaret Costa and Sharon Guthrie. In it, Freedson compared the relative strength of men and women.

In absolute numbers, men are stronger than women, particularly in the upper body. However, men's superior strength comes from their body mass. Pound for pound, women's legs are actually stronger than men's, and the difference in upper-body strength isn't as great as it initially appears.

"When leg press strength is expressed relative to lean body mass, female strength is slightly greater than male strength," Freedson wrote (1). Women leg-pressed 110 percent of what men could leg-press per kilogram of lean body mass.

Freedson cited a multiple-regression analysis that found 97 percent of the gender difference in strength is a result of muscle mass.

"The findings strongly suggest that if training status is similar for each sex, muscle mass differences account for nearly all of the gender differences in strength," Freedson reports (1).

With that in mind, much of the perceived strength difference between men and women is likely sociocultural. Traditionally, women have used less of their upper body than men, and as a result those muscles are underdeveloped. Women and girls are perceived as weaker than men, so they are not asked to use and develop their muscles. It's a cyclical pattern, reinforcing a status quo that isn't supported by physiology.

The statistics of the 2015 female CrossFit Games competitors show numbers that are beyond most men. Brooke Ence and Kara Webb both report their max snatch as 205 lb. Lindsey Valenzuela reports a 255-lb. clean and jerk. All weigh about 150 lb.

Women also compare favorably with men in other aspects of fitness beyond just strength.

"When the 7.5-inch height difference between Florence Griffith Joyner and Carl Lewis (is) factored into their running speeds, it turns out that she runs at a relative velocity of 0.28 heights per second faster than he does," Roth and Basow wrote in "Femininity, Sports, and Feminism" of the Olympic sprint champions from the '80s (3).

In an article on Active.com, Steven Munatones reported that women perform better than men in open-water swimming competitions, especially as the distances increase.

"In particular, the average time of women in the Catalina Channel is seven minutes faster than the average time for men. What is notable is that the overall records in both directions are held by women," Munatones wrote. The Catalina Channel swim is a 20.1-mile swim between Catalina Island and the Southern California mainland.

At the 2013 Reebok CrossFit Games regional competitions, men and women used the same weight for the first event, Jackie: 1,000-m row, 50 thrusters with a 45-lb. bar and 30 pull-ups.

"I had the fastest women's time in the whole world," said five-time CrossFit Games competitor Elisabeth Akinwale, whose score of 5:59 would have bested 17 of 48 men in the Europe Regional.She can also clean and jerk 240 lb., snatch 200 lb. and deadlift 425 lb.

Many coaches to elite-level athletes have said women are better at high-skill movements, Akinwale said.

"Recent studies suggest that estrogen buffers women against muscle soreness after exercise," Dowling wrote on her website.

She continued: "Estrogen protection may help explain why women can endure longer exercise sessions than men."

Akinwale noted women can work closer to their one-rep max than men can.

"I did a 20-rep back squat at 250 lb. I put that in the (one-rep-max) calculator, and it put my one-rep max at 450 lb.," which she said is not accurate. "That's because (the calculator is) based on men."

While the gap between men's and women's athletic performance might not be as great as it seems, the focus of our culture is on male athletics. In almost all sports, male professional athletes get more airtime, more money and more sponsorships.

"Like education, work, religion, and family, the cultural institution of sports has the power to affect women's status in society, and not necessarily in a positive manner," Roth and Basow wrote. They argue that although women participate in sports as much as men, most mainstream sports reinforce the idea of male dominance (3).

Are Muscles Manly?

The CrossFit Games are an exception to the rule. At the Games, women earn the same as men and get equal airtime and media attention. Inside a CrossFit gym, women are taught to focus on what their bodies can do and to appreciate strength and athleticism.

This doesn't mean everyone is accustomed to seeing a woman with defined muscles.

Azadeh Boroumand finished 18th at the CrossFit Games in 2012. Formerly a college volleyball player, she had started doing CrossFit in 2009. She said it wasn't until CrossFit that she saw definition in her biceps, triceps and lats. As her body changed and became more muscular, Boroumand said she began noticing how people reacted to her athletic physique.

"A lot of people have this idea of what a woman should look like and what a man should look like," she said.

Boroumand said she'd get Facebook messages that said, "I like you as CrossFitter because you aren't too bulky and you don't look masculine."

"What does that mean?" Boroumand said she wondered. "I started becoming very aware of it. I started noticing how men are very intimidated by a woman who has muscles."

"In my last relationship … I was constantly told that I looked too manly. So when I put on a dress I started seeing that myself. It took me about a year to stop caring about how I looked and to be more concerned about my performance again," she said.

Boroumand said she thinks CrossFit has had a role in changing traditional standards of male and female appearance and ability.

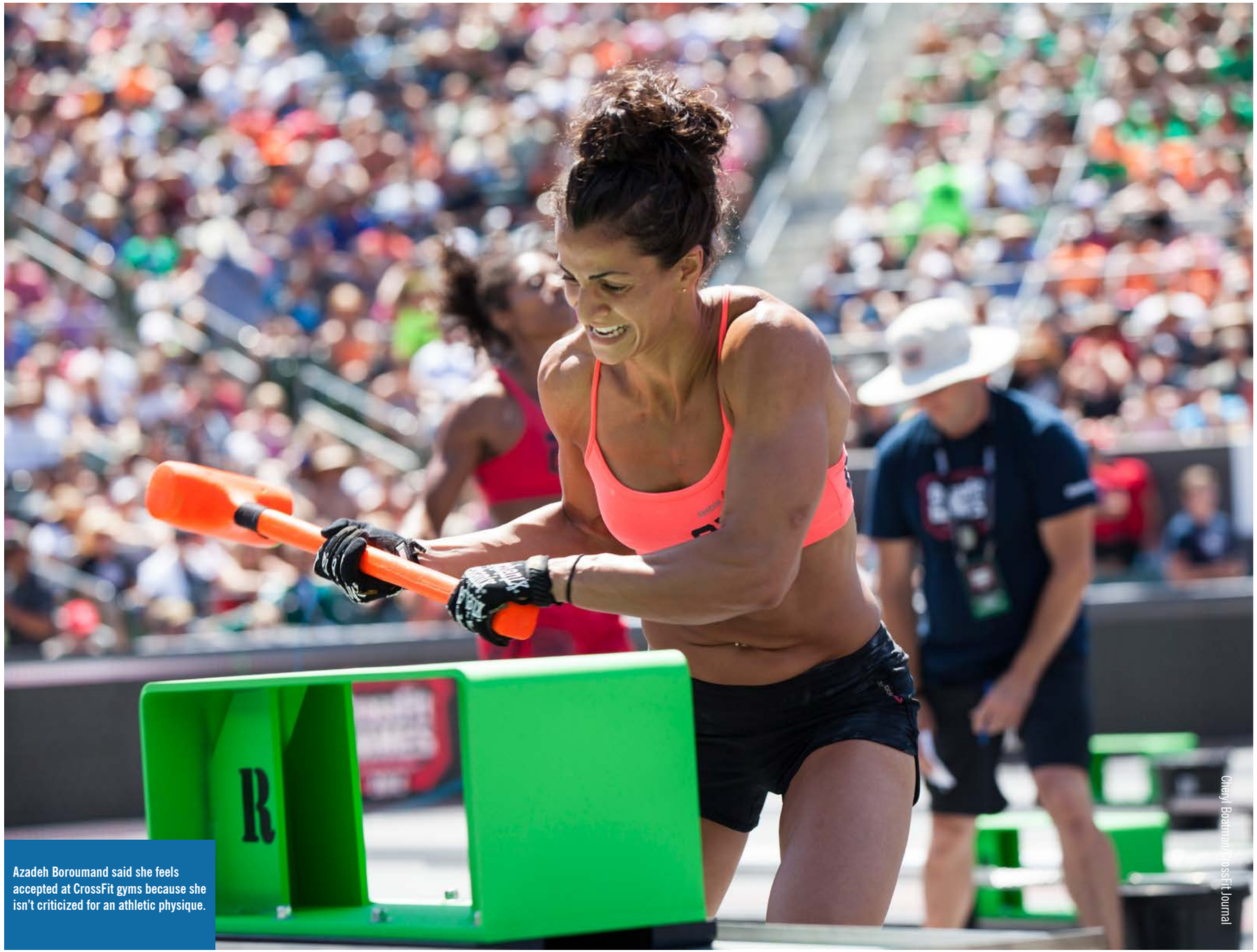
"I can honestly say that one of the only places I feel socially accepted is within the CrossFit community because I walk into a CrossFit box and I don't hear, 'Well, she's too muscular,'" Boroumand said.

Women in other sports aren't so lucky. In the summer of 2015 Serena Williams dominated the news. While most of the coverage was about her performance on the tennis court, the peanut gallery of social media chattered about her body, debating the "manliness" of her 5-foot-9-inch, 150-lb. frame.

Then The New York Times entered the fray.

In July 2015, Ben Rothenberg wrote an article titled "Tennis's Top Women Balance Body Image With Ambition."

A more accurate title might have been, "Serena Williams' Rivals Talk About Why They Don't Want to Look Like Her." The piece started off by describing Serena Williams' "large biceps" and "mold-breaking muscular frame" and then stated, "Her rivals could try to emulate her physique, but most of them choose not to."



Azadeh Boroumand said she feels accepted at CrossFit gyms because she isn't criticized for an athletic physique.

Oney Boatman/CrossFit Journal

Thomas Campitelli/CrossFit Journal

Elisabeth Akinwale said she grew up around strong women and always tries to influence female CrossFit athletes in a similarly positive manner.

Then followed a series of quotes from female professional tennis players and their coaches about their fear of becoming too muscular, equating muscles with manliness.

Agnieszka Radwanska is a 5-foot-8, 123-lb. Polish professional tennis player. Tomasz Wiktorowski, her coach, said she tries to stay as small as possible.

"It's our decision to keep her as the smallest player in the top 10. Because, first of all she's a woman, and she wants to be a woman," Wiktorowski told Rothenberg.

German player Andrea Petkovic said she hated seeing photos of herself hitting a two-handed backhand because of her prominent arm muscles.

"I just feel unfeminine," she said. "I don't know—it's probably that I'm self-conscious about what people might say."

In response to the overwhelming negative reaction to the piece, the Times released a follow-up article detailing the shortcomings of the original article.

It's tempting to dismiss the fears of these athletes, especially when Maria Sharapova said in the New York Times article, "I can't handle lifting more than five pounds. … It's just annoying, and it's just too much hard work."

However, for a female athlete, staying small might in fact be a smart business decision. Six-foot-2-inch, 130-lb. Sharapova is ranked below Williams but earns $23 million in endorsements to Williams' $13 million.

Our culture's emphasis on a woman's appearance—even when she is competing as an elite athlete—is insidious.

Like many CrossFit Games athletes, Akinwale relies on sponsorships for part of her income. And like Williams, Akinwale finds sponsorship is not always tied to athletic performance.

"I share sponsors with some women who have never done anything athletically. They train … and they post a lot of videos of their cleavage and stuff, and the camera angle going up toward their butt, but they are not successful athletes," Akinwale said.

She added: "So, while I understand it, it's sort of frustrating. … Are there any men (in CrossFit) who are sponsored who are just basically hot? I can't think of any.

Akinwale is aware of what is popular in the world of social media, so she said she often treads the line as far as sharing photos of herself.

"I want to be marketable, and I know these are the things that get likes, and I know that sponsors want that," she said.

But she said she also wants to stay true to her core values. Akinwale knows she is influential within the CrossFit community, and she said she thinks about how she can shape what's expected of female CrossFit athletes.

Akinwale said the idea of the frail female was not part of her experience growing up as a woman of color.

"(It's) a very white-middle-class-feminist ideology," Akinwale said. "That's not the reality for working-class women or women of color. Those women have always been working, those women have always been doing physical labor, so I think it's a little bit of a different paradigm. So, my mother worked very physical jobs, lots of jobs, my whole life. I never saw the image of a weak woman, ever."

This doesn't mean she's always felt completely accepted in the gym.

"I started out in a weight-room environment in the late '90s," Akinwale said. It used to be I'd walk in the weight room and it was all men, and everyone would (have their) eyes on me. … It was very uncomfortable."

In contrast she remembers her first day in a CrossFit gym. She was waiting for a class to start, and saw two women snatching.

"And of course at the time I didn't know what they were doing, and I was like, 'Yes. That's what I want to do.' Just being around other women who wanted to work hard, who wanted to lift heavy weight. I had never really seen a mass presence like that. It definitely normalized it," Akinwale said.

> "I never saw the image of a weak woman, ever."
>
> —Elisabeth Akinwale

"In a CrossFit gym, you blend right in, and that feels good. That's the community you want," she said.

As she met women from other backgrounds through CrossFit and heard their stories of worrying about getting too bulky or looking masculine, she realized how important it was to be an example to other women. It was in CrossFit gyms—where physical ability is the centerpiece—that Akinwale said she began to see many women still subscribe to traditional notions of strength.

"For me personally, I look at it as: OK, this is even more reason to keep standing up and being a presence because there are some barriers that I don't feel … are very real for other women," Akinwale said.

As a relatively new sport, CrossFit doesn't have the entrenched sexism present in many other professional sports. Men and women get equal prize money and airtime at the Games.

"I think it's very symbolic of the fact that our sport values the contributions of female athletes just as much as men," Akinwale said. "People enjoy watching the women just as much as they enjoy watching the men."

This equality is present at an affiliate level as well.

"Males dominate coaching overall, particularly for coaching men," Akinwale said about most sports. Not in CrossFit, at least at the affiliate level.

Female coaches abound in CrossFit gyms, but the October 2014 CrossFit Journal article "Coach." detailed a lack of balance at the upper levels of the sport.

"When I first started coaching … there were some men who didn't want to accept coaching from a female." Akinwale said that changed when they saw her skill as a coach and an athlete.

The Next Generation

A recent cover story in The Economist titled "The Weaker Sex" reported girls are outperforming boys in reading at the high-school level and enroll in universities at a higher number than boys, but traditional patterns take hold once men and women enter the workforce.

Women, as a group, are better qualified than men but earn about three-quarters as much as men, the article reported. In business, men hold more of the top positions than women.

"According to Claudia Goldin, an economics professor at Harvard, the 'last chapter' in the story of women's rise—equal pay and access to the best jobs—will not come without big structural changes," the article reported.

Cultural changes are needed as well. True equality has not yet arrived when the conversation surrounding the best female tennis players in the world is about their appearance.

We've come a long way, baby, but there's still more work to be done. Part of that work is moving past the idea that muscles and strength are masculine traits and that men are inherently physically stronger than women.

The work begins with children. It starts by making a conscious effort to value the physical accomplishments of girls as much as boys and by avoiding defining strength as male and frailty as female.

That work is continued in CrossFit gyms around the world, in which women prove to themselves, and others, that strength has no gender. ■

References

1. Costa MD, Guthrie SR. *Women and Sport: Interdisciplinary Perspectives*, Champaign, Ill.: Human Kinetics, 1994. Pp. 179.

2. Dowling C. *The Frailty Myth: Women Approaching Physical Equality*, New York, N.Y.: Random House, 2000.

3. Roth A, Basow S. Femininity, sports, and feminism: Developing a theory of physical liberation. *Journal of Sport & Social Issues*: 28(3): August 2004.

About the Author

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"I think it's very symbolic of the fact that our sport values the contributions of female athletes just as much as men." —Elisabeth Akinwale

Brian Sullivan/CrossFit Journal

THE CrossFit JOURNAL

RESTRICTED SUCCESS

BY HILARY ACHAUER

Experts says sensible eating and regular activity trump restrictive diets that often result in failure.

Dave Re/CrossFit Journal

Starting a new diet can be thrilling.

It's a time of hope and possibility. The process often starts with a trip to the drugstore for a notebook to write down the details of every meal. Then it's off to the grocery store to fill the cart with strange ingredients such as chia seeds and apple-cider vinegar. Next, a post on Facebook and Instagram to let everyone know it's Day 1 of your new diet. Through willpower and perfect eating habits, you are going to get the body of your dreams, at which point you'll move on to other things.

And then, a year later, you find yourself exactly where you started. Or maybe a few pounds heavier, filled with disappointment.

If you've ever experienced this scenario, you're not alone. And it's not your fault.

In her new book "Secrets From the Eating Lab: The Science of Weight Loss, the Myth of Willpower, and Why You Should Never Diet Again," Traci Mann, professor of psychology at the University of Minnesota, shares her findings after 20 years of research. She discovered restrictive diets don't work, often result in weight gain and might ultimately be unhealthy. What's more, losing weight is not a matter of willpower. When we diet, we are fighting against our brains and our biology.

All this doesn't mean we should sink into a torpor surrounded by potato chips and ice cream. Istead of riding the roller coaster of restrictive diets, Mann recommends adopting healthy eating habits, exercising and—most importantly—being happy with your leanest livable weight.

Sound familiar?

Diets Work—Until They Don't

We are repeatedly tricked into starting restrictive diets for one reason: They all work—at first.

"Since the 1940s, hundreds of studies have shown that dieters lose an average of five to fifteen pounds over the first four to six months on a diet," Mann wrote in "Secrets From the Eating Lab" (4).

No matter the diet—whether it comes from a scientist or a celebrity—most people lose weight at the beginning.

New diets often start with intensity but end with ice cream, doing little for long-term health.

Dave Re/CrossFit Journal


Dave Re/CrossFit Journal

The brain can alter its response to food, and if you're on a restrictive diet, a pair of peppers might pale in comparison to a pepperoni pizza.

The problem occurs after this honeymoon period. First, people don't lose enough weight. Second, they don't keep it off.

"The most rigorous diet studies find that about half of dieters will weigh more four to five years after the diet ends than they did at the start of the diet," Mann wrote (4). Even worse, she said this is a low estimate of diet failure because it comes from studies biased toward showing diets work.

Stretching back more than 20 years, study after study shows restrictive diets don't lead to long-term weight loss (3).

Why, then, do people keep dieting even with dismal long-term results?

As former Weight Watchers finance director Richard Samber put it, dieting is like playing the lottery.

"If you don't win, you play it again. Maybe you'll win a second time," he said in the BBC documentary "The Men Who Made Us Thin: Part 1."

In the documentary, Samber was asked how he could have a successful business if only 16 percent maintained their weight loss.

"It's successful because the other 84 percent have to come back and do it again. That's where your business comes from," Samber said.

If you have a relatively healthy lifestyle—you exercise and eat well consistently—you've probably noticed your body settles into a consistent weight.

The reason diets fail is not a matter of willpower or a personal failing on your part. It's biology.

If you have a relatively healthy lifestyle—you exercise and eat well consistently—you've probably noticed your body settles into a consistent weight. The number may fluctuate 5 or 10 lb. either way, but it's most likely fairly stable.

If your stable weight means you have the abs of Margaux Alvarez or the pecs of Rich Froning, this is great news. If, however, you look in the mirror and don't see the physique of a CrossFit Games athlete, you might come to the conclusion it's time for a restrictive diet.

Mann wrote that this is a mistake.

"Your body uses many biological tricks to defend your set range, particularly if you get below it, because this is when your body thinks you are starving to death," she wrote (4).

Most people are aware restrictive diets slow the metabolism, which means it takes longer for your body to convert what you eat and drink into energy, but this is only one of the physiological effects caused by severely cutting calories.

When you're dieting, if it seems as if delicious food is everywhere, it's not your imagination. When you're hungry from dieting, your brain responds differently to food, causing you to pay more attention to food when you find it and making it look even more delicious and tempting than usual (8).

The brain also responds to hunger and starvation by reducing activity in the prefrontal cortex, the part of your brain that helps you make decisions and resist impulses (6). This means restrictive diets cause you to notice food more and become less able to resist tempting treats.

Losing weight results in a loss in body fat, which most people consider a good thing. However, body fat is a part of the endocrine system, producing hormones involved in the sensations of hunger and fullness. Less body fat means there are less of the hormones that make you feel full (leptin) and more of the hormones that make you hungry (ghrelin).

"One study found that these changes in hormone levels were still detectable in people a year after they started dieting," Mann wrote, referencing an article from the New England Journal of Medicine (9).

Most people are aware of the role stress plays in weight gain. Stress causes the body to release cortisol, and cortisol makes energy available in your bloodstream in the form of glucose. That's helpful if you're a cave person who needs to flee a predator, but if work deadlines or bills cause your stress, the result will often be fat, stored in your belly. This is because cortisol affects where fat is stored. People with elevated cortisol store fat centrally, around their organs. Stress also causes many people to overeat, exercise less and sleep less.

In a frustrating catch-22, the study "Low Calorie Dieting Increases Coritisol" revealed that cortisol levels in dieters' saliva showed the act of restricting calories led to a stress response (10).

"It's not just that people should try to avoid stress while dieting," Mann wrote (4). "It's that stress *cannot be avoided when you are dieting*, because dieting itself causes stress. Dieting causes the stress response that has already been shown to lead to weight gain" (italics hers).

What to Do?

Does all this depressing science mean we should give up and dive headfirst into a box of doughnuts?

No. Remember that Mann's research focuses on restrictive, short-term programs that require the participant to be hungry and deprived.

There is a way to eat healthy and not feel deprived, to feel good and maintain a stable weight. In a nutshell, that prescription looks a lot like CrossFit's original nutrition directive, stated simply in the opening lines of "World-Class Fitness in 100 Words" by CrossFit Founder and CEO Greg Glassman: "Eat meat and vegetables, nuts and seeds, some fruit, little starch and no sugar. Keep intake to levels that will support exercise but not body fat."

How does that prescription look in practice in the real world?

Annie Michel is a 59-year-old trainer at CrossFit Beacon in Portland, Maine. She's been doing CrossFit for five years, and she competed in the Masters Women 55-59 Division at the CrossFit Games in 2012, when she took second, and in 2013, when she placed eighth.

Michel was always athletic, but after raising four children and putting their activities before her own, she gained weight.

"I didn't get out enough with (my kids). I snacked with them. I was always active with them, but it was not the same. I ate the way the (food) pyramid told me to eat and never lost any weight. I was heavy and would go up and down 10 lb.," Michel said, referencing U.S. Department of Agriculture guidelines for healthy eating published in 1992 (the pyramid has since been updated to a plate).

She resigned herself to being active but heavy until she started CrossFit in May 2010.

"I connected with the athlete in me the day I walked through the door," Michel said. "Within a month I dropped 20 lb., just eliminating grains and being in a different mindset and (using) portion control."

Then, she said, her weight stopped being the focus. She just wanted to move better.

"I think within the first year I dropped 35 lb. I happened to be good at (CrossFit)," Michel said.

She said she follows a version of Mark Sisson's 80/20 Principle, outlined on the "primal living" site Mark's Daily Apple: It's unrealistic to eat perfectly 100 percent of the time. If you eat well 80 percent of the time, that's good enough.

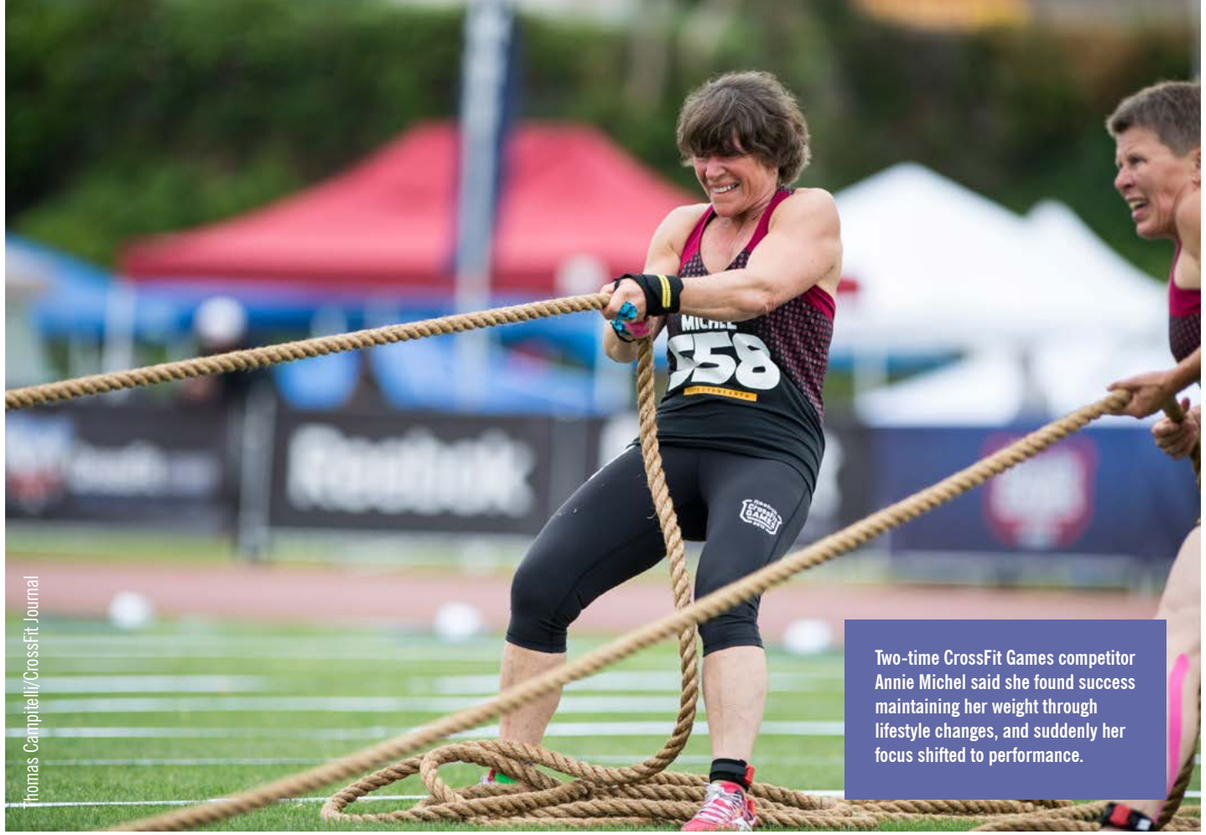
"If I want to go out and have an ice-cream sundae at our local place once in a while, I will," Michel said. "I really subscribe to that."

"The biggest thing is I try to stay away from sugar as much as possible. I don't eat a ton of grains. Once in a while I'll have some pizza," Michel said.

Now that she's taking a break from training for the Games, Michel said she has to keep an eye on portion control.

"Am I eating enough—but the right things?" Michel said she wonders.

Michel beat the statistics by keeping her weight off for five years. She did it by taking a long-term, sustainable approach—focusing on a way of eating that will last a lifetime, not for the length of the latest diet. She reinforced that plan with fitness.



Thomas Campitelli/CrossFit Journal

Two-time CrossFit Games competitor Annie Michel said she found success maintaining her weight through lifestyle changes, and suddenly her focus shifted to performance.

Dave Re/CrossFit Journal

Start simple: Eliminating empty calories from added sugars can have dramatic effects on the body and metabolism.

She said she's up about 6 or 8 lb. from where she'd like to be, but she isn't planning any drastic diets to try to lose that small amount of weight.

"It's really quite interesting how I'm able to just eat and not think about what I eat and eat a lot and enjoy it," she said.

Her No. 1 rule: "Don't have the crap in the house," Michel said. She also said she's changed her perspective on what constitutes a treat.

"There's nothing more satisfying to me than some celery and cashew butter. It's like my candy," Michel said.

> "There's nothing more satisfying to me than some celery and cashew butter. It's like my candy."
>
> —Annie Michel

Michel encourages everyone to become label readers as a way to avoid those sneaky, sugar-laden foods.

"Sugar is everywhere in every food," Michel said. To avoid sneaky sources of sugar, Michel stopped taking sugar in her coffee and said she's wary of "healthy" desserts that contain a lot of sugar.

Knowing that sugar can appear unexpectedly means Michel can avoid it most of the time and really enjoy the treats when she chooses to indulge.

"I know that there are naturally going to be imperfections in all areas of my life," Michel said.

Michel trains about five to six days per week, with one of those days being an activity outside the gym: a long paddle in a kayak, a bike ride or a three-hour gardening session.

Julie Goffena, 51, has also managed to maintain a consistent weight. She started CrossFit at Practice CrossFit in Troy, Ohio, the same year as Michel—2010. Goffena was active as an adult, but the former gymnast and cheerleader was bored with her exercise routine at the local YMCA.

"I walked into (Practice CrossFit), and I knew immediately that there was no turning back for me," Goffena said.

Goffena, who drives 30 minutes each way to her affiliate, works out about four to five times a week.

"My weight really hasn't fluctuated or changed over the years. I've experimented with different diets and food trends over the years. Some were weird—like the cabbage-soup diet—for a day. I have been fortunate because I've always been active. It hasn't been a fight for me, but that doesn't mean I haven't always been healthy—that whole 'skinny fat' thing," she said.

Goffena follows the Paleo Diet, which she said was an adjustment at first.

"It was absolutely opposite of everything we are taught. I always thought plenty of fruits and grains and avoid all fat was the way to go. … It took me a while to get on board," she said.

Like Michel, Goffena doesn't try to be perfect at all times.

"I am going to have a few cheats here or there, or if my husband invites me to the local ice-cream parlor … I'm always going to say yes to that. But I can get right back (to healthy eating)," she said.

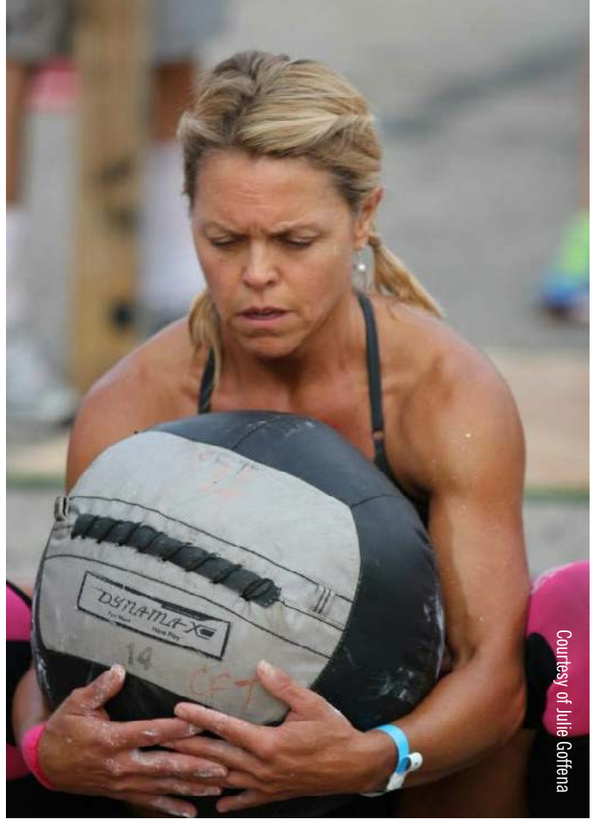
The best part about the diet she follows, Goffena said, is that it isn't restrictive.

"I never feel 'hangry.' I don't feel like that. I don't feel like I'm being held captive to the diet in any way at all," she said.

> "Keep it simple but don't be weird over it."
>
> —Julie Goffena

She avoids processed sugars and makes an effort to measure her protein with a food scale to control her portions.

"I eat two large meals a day, and then I supplement in between those with bars and shakes and things like that," Goffena said.



Courtesy of Julie Goffena

Julie Goffena follows the Paleo Diet but doesn't find it restrictive. She simply makes healthy choices most of the time and stays active.

Dave Re/CrossFit Journal

Healthy eating can include weighing and measuring to add precision, and intake can be altered to find the exact amounts that produce the best results for each individual.

"I've kept a steady weight. But I look different. I have the muscle separation now. I look like I have muscles, which is really hard to attain when you're in your 50s. You really have to fight for that. CrossFit and following a Paleo-type diet has made that possible for me," Goffena said.

"You know, keep it simple but don't be weird over it. It shouldn't be your focus. I don't want to sit around and talk about food all the time. Food is food and I'm gonna eat it because I need to. I like having the freedom from it," Goffena said.

The Importance of Exercise and Healthy Hacks

What role does exercise play in weight loss? Many people begin an exercise program simply to lose weight, but as The New York Times reported in the 2012 article "Dieting vs. Exercise for Weight Loss," "Even active people will pack on pounds if they eat like most of us in the West. The underlying and rather disheartening message of that finding, of course, is that physical activity by itself is not going to make and keep you thin."

This does not mean you should forgo exercise. The benefits of regular physical activity are broad and varied. Working out does many wonderful things for your health, and it's likely to keep you alive longer.

A review of 305 randomized clinical trials found exercise was just as effective as drugs in preventing death among people with heart disease, stroke and prediabetes (5). Exercise helps relieve stress and anxiety (7) and can have long-term cognitive benefits (2).

However, an hour of sweating can't make up for poor nutrition, just like a week-long cleanse or a month-long nutrition challenge is not the way to maintain a healthy weight for the long term. It's becoming apparent that a two-pronged approach to lifestyle is required: a healthy diet and regular exercise (1).

With that in mind, it's not surprising CrossFit's basic diet prescription produces great results in many cases. Any affiliate in the world can point to a collection of formerly sedentary individuals who adjusted their diets and added exercise to achieve dramatic improvements in health. Similarly, active people who improve poor diets often see dramatic improvements in athletic performance as they "get both oars in the water," so to speak. Of course, the basic diet plan can be fine tuned for each individual, and CrossFit recommends experimentation and research as each athlete works to find the ideal prescription.

For those who are committed to eating high-quality, unprocessed food and avoiding sugar, there are a few simple tricks to keep unhealthy snacks at bay and portions reasonable.

Brian Wansink, head of Cornell's Food & Brand Lab and author of the book "Mindless Eating," suggests using a smaller plate. A small plate filled to the edges looks to our brain to contain more food than a larger plate containing the same amount (11).

In "Secrets From the Eating Lab," Mann listed several additional suggestions gathered during her research. Make fruits and vegetables easier to access by keeping a supply of cut-up vegetables in the fridge, and eat your salad or vegetables first. Don't deprive yourself of other food; just start out with the produce. This will help you fill up on the healthiest part of your meal, the one thing on your plate you can generally eat with abandon. By the time you get to the rest of your plate you'll be less hungry and less likely to overeat.

Dave Re/CrossFit Journal

Many athletes have found that after a period of weighing and measuring, they're able to quickly eyeball appropriate quantities and easily prepare healthy, delicious meals.

Mann suggested other simple tricks to make it harder to ingest junk food. Don't keep the food in the house, and avoid driving by your favorite bakery or doughnut shop. Set up your life so the healthy choices are the easy choices. Surround yourself with healthy eaters.

You may have noticed when you're out to dinner with a bunch of health-conscious CrossFit athletes, most people order similarly. But once someone relents and starts in on the bread basket or picks up the dessert menu, the rest of the group often falls like dominoes.

We Are Not Our Abs

If you're able to consistently follow all the steps listed above—avoid restrictive diets; eat healthy, unprocessed food; exercise regularly—there's one final step. And it's probably the most difficult of all.

Learn to be OK with your body.

The most striking paragraph in Mann's book references "The Body Project: An Intimate History of American Girls" by historian Joan Jacobs Brumberg. In the book, Brumberg studied diaries of young women in the 1890s and discovered their journals were filled with concern about their character.

"They wrote about striving to be kinder and more concerned for others, working harder in school, and rejecting frivolity," Mann wrote (4).

Brumberg looked at diaries from the same age group in the 1990s and found the girls were still preoccupied with self-improvement—with a focus on their physical appearance, not their character. The path to improving their appearance almost always involved buying something.

Achieving good health and improving fitness are worthwhile goals, but it's easy to get caught in the weeds of chasing a body type you were never meant to have. Even looking at the fittest humans on the Earth—the CrossFit Games athletes—you'll see a range of body types, and all of them are tremendously functional. Walk into any affiliate and you'll see a wider range, but you'll still find functional people who are training hard and generally supporting that training with good nutrition.

Pursue good health and fitness, but not at the expense of enjoying your life. Seek balance, not obsession. Don't get sucked into the latest diet fad promising perfection. Value happiness and equanimity over a perfectly shredded physique. When in doubt, "Eat meat and vegetables, nuts and seeds, some fruit, little starch and no sugar. Keep intake to levels that will support exercise but not body fat."

And switch to smaller dinner plates. ■

References

1. Caldwell P, Hopkins M, King NA, Stubbs RJ et al. Exercise alone is not enough. *Public Health Nutrition* 12(9A): 1663-6, September 2009. Available at http://www.ncbi.nlm.nih.gov/pubmed/19689837. Accessed Sept. 15, 2015.

2. Hopkins ME, Davis CF, VanTieghem MR, Whalen PJ et al. Differential effects of acute and regular physical exercise on cognition and affect. *Neuroscience* 215: 59-68, July 26, 2012. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3374855/. Accessed Sept. 15, 2015.

3. Kramer FM, Jeffrey RW, Forster JL, and Snell MK. Long-term follow-up of behavioral treatment for obesity: Patterns of weight regain among men and women. *International Journal of Obesity* 13(2): 123-36, 1989. Available at http://www.ncbi.nlm.nih.gov/pubmed/2663745. Accessed Sept. 15, 2015.

4. Mann T. *Secrets From the Eating Lab: The Science of Weight Loss, the Myth of Willpower, and Why You Should Never Diet Again*, New York, N.Y.: HarperCollins, 2015. Pp. 15, 22, 29, 167.

5. Naci H. and Ioannidis JPA. Comparative effectiveness of exercise and drug interventions on mortality outcomes: Metaepidemiological study. *BMJ* 347: January 2013. Available at http://www.bmj.com/content/347/bmj.f5577. Accessed Sept. 15, 2015.

6. Page KA, Seo D, Belfort-DeAguiar R, Lacadie C et al. Circulating glucose levels modulate neural control of desire for high-calorie foods in humans. *Journal of Clinical Investigation* 121(10): 4161-4169, Oct. 3, 2011. Available at http://www.jci.org/articles/view/57873. Accessed Sept. 15, 2015.

7. Petruzzello SJ, Landers DM, Hatfield B, Kubitz K et al. A meta-analysis on the anxiety-reducing effects of acute and chronic exercise. *Sports Medicine* 11(3): 143-82, March 1991. Available at http://www.researchgate.net/profile/Steven_Petruzzello/publication/21326590_A_meta-analysis_on_the_anxiety-reducing_effects_of_acute_and_chronic_exercise._Outcomes_and_mechanisms/links/54734b230cf24bc8ea19ed2b.pdf. Accessed Sept. 15, 2015.

8. Stice E, Burger K, and Yokum S. Caloric deprivation increases responsivity of attention and reward brain regions to intake, anticipated intake, and images of palatable foods. *Neuroimage* 67: 322-20, 2013. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693571/. Accessed Sept. 15, 2015.

9. Sumithran P, Prendergast LA, Delbridge E, Purcell K et al. Long-term persistence of hormonal adaptations to weight loss. *New England Journal of Medicine* 365(17): 1597-1604, Oct. 27, 2011. Available at http://www.nejm.org/doi/full/10.1056/NEJMoa1105816. Accessed Sept. 15, 2015.

10. Tomiyama JA, Mann T, Vinas D, Hunger JM et al. Low calorie dieting increases cortisol. *Psychosomatic Medicine* 72(4): 357-64, May 2010. Available at http://www.dishlab.org/pubs/Tomiyama%20et%20al%202010%20Low%20Calorie%20Dieting%20Increases%20Cortisol.pdf. Accessed Sept. 15, 2015.

11. Wansink B and Van Ittersum K. Illusive consumption behavior and the Delboeuf illusion: Are the eyes really bigger than the stomach? *Annual Review of Nutrition* 24: 455-79, 2004.

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THE CrossFit JOURNAL

Soda War

BY ANDRÉA MARIA CECIL

Bills requiring health-warning labels for sugar-sweetened beverages have failed to become law but succeeded in raising awareness.

Dave Re/CrossFit Journal

Courtesy of Jeffrey Dinowitz's office

New York Assemblyman Jeffrey Dinowitz is one of two lawmakers in the U.S. to introduce a bill requiring health-warning labels for sugary drinks.

The United States' first two legislative measures seeking to add health-warning labels to sugar-sweetened beverages aren't winning battles against Big Soda yet, sponsoring lawmakers conceded, but they are bolstering the war effort.

"It's part of a national movement," said Sen. Bill Monning, the Democrat who first introduced the Sugar-Sweetened Beverages Safety Warning Act in February 2013 as Senate Bill 1000 in the California State Senate.

The label would read, "Safety warning: Drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay." It would apply to any sweetened nonalcoholic drink that has added caloric sweeteners and contains 75 calories or more per 12 fluid ounces, according to the proposed act.

"We think it's good public policy, but it also provides an avenue for education, for raising the awareness of both our colleagues and the public and our constituents in the growing knowledge of the adverse effects of sugar-sweetened beverages," Monning said.

SB 1000 passed the Senate but ran out of time during the regular legislative session for the House to consider it. In February 2015, Monning again introduced the act—this time as SB 203. It failed to make it out of the Senate Health Committee. Monning called its failure disappointing and "a testament to the power of the (Big Soda) industry."

"From a public-health point of view—whether a member agrees with this being the best strategy—you would think a health committee would want the opportunity for it to be heard," said Monning, the Senate majority leader.

During the next legislative session, which is scheduled to begin in December 2015, the senator from Carmel said he intends to revisit efforts aimed at reducing consumption of sugar-sweetened beverages. That could manifest itself as a version of SB 203 or of 2013's SB 622—which would have required a tax on sugar-sweetened beverages—or an entirely different strategy.

"We haven't made any decisions for 2016," Monning said in mid-October. "I remain committed to advancing education on the known public-health risk … in our communities."

Meanwhile, in New York state, Assemblyman Jeffrey Dinowitz, a Democrat from the Bronx, modeled his Sugar-Sweetened Beverages Safety Warning Act after Monning's measure. Dinowitz introduced the bill in January.

"My hope is (this act) will be one of many things that help contribute to diminishing the amount of sugar intake for people, particularly kids," he said.

Two of the New York Assembly's committees—Health as well as Consumer Affairs and Protection—held a joint public hearing on the bill in April. Dinowitz intends to vigorously pursue the measure come January but is realistic about its future.

"This is not something that we're going to necessarily pass immediately," he said.

In the interim, it's important to raise consumer awareness and consciousness, Dinowitz added.

"The very fact that this issue's being discussed, I think, is important."

The Good Fight

What Dinowitz and Monning face is a Big Soda lobby fortified by wealth and political influence.

"I understand that the industry is very powerful, and they put their money where their mouths are when it comes to stopping legislation they don't like," Dinowitz said.

Indeed.

Big Soda has spent US$106 million between 2009 and 2015 to defeat public-health initiatives at the local, state and federal levels, according to "Big Soda vs. Public Health," a report published by the Center for Science in the Public Interest.

Among other tactics, the industry portrays such initiatives as job killers, calls them regressive and "will try to paint the public-health measure as somehow denying consumers freedom of choice," explained Jim O'Hara, the report's author and the director of health promotion policy at the center.

In July, the American Beverage Association (ABA)—representing the likes of The Coca-Cola Co. and PepsiCo—sued the City of San Francisco over two ordinances, one of which requires health-warning language on ads for sugar-sweetened beverages: "Warning: Drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay. This is a message from the City and County of San Francisco." The ABA claims the ordinances violate the First and 14th Amendments to the U.S. Constitution.

In September, the city asked the U.S. District Court for the Northern District of California to dismiss the suit.

The ABA called Monning's and Dinowitz's bills "misguided and misleading" via an email from external spokeswoman Kelley Kaufman.

"Warning labels on beverages does nothing to help inform or educate people about their beverage choice."

The Epidemic

On a so-called "fact sheet" CalBev issued to encourage a "no" vote on SB 203, the California industry association noted that a 2.1-oz. glazed donut, an 8-oz. pomegranate-blueberry juice drink and an 8-oz. protein juice beverage all separately have more calories than a 12-oz. can of soda yet would be exempt from the health-warning label.

"Americans consume nearly twice as many calories from cupcakes, donuts and other processed foods than they do from sugar-sweetened beverages," according to the document.

But over the decades, scientists and researchers have repeatedly said calories give no indication of how a food will affect the body. When it comes to the fructose and glucose components of sugar, the body metabolizes them differently and with entirely different tissues and organs, explained Gary Taubes, investigative journalist and best-selling author of "Good Calories, Bad Calories" and "Why We Get Fat." Coca-Cola, for example, contains high-fructose corn syrup, a mixture of unbonded fructose and glucose.

Dinowitz and Monning know as much.

"A nutrition label simply gives you ingredients," Dinowitz said. "It doesn't tell you the effect of those ingredients."

And when it comes to sugar, those effects have been astounding.

More than 29 million people of all ages in the United States—or 9.3 percent of the nation's population—have diabetes, according to the U.S. Centers for Disease Control and Prevention. Of those, 21 million people have been diagnosed, while more than 8 million people are undiagnosed.

"The number of people who are obese, the number of people who have Type 2 diabetes has gone up and up, and it's an enormous public-health problem. And it's likely at this point to get worse," Dinowitz said.

He added: "The single-largest contributor to the massive amounts of sugar people are ingesting comes via sugary drinks."

The science doesn't argue.

"When you drink sugary beverages, there's a much more rapid absorption of sugar. You can take in a huge amount in a very short time, so the concentration that hits the liver, and particularly of fructose, is higher than in other types of foods," explained Richard Johnson, author of "The Fat Switch" and professor of renal diseases and hypertension at the University of Colorado Denver's Anschutz Medical Campus in Aurora.

The data, he added, are not only "overwhelming" but "incontrovertible": Sugary beverages increase your risk for obesity, diabetes, fatty-liver disease and chronic liver disease, among other metabolic derangements.

"I understand the defense of 'there are other things in the world that aren't good,'" Johnson noted. "But you've got to start somewhere and this is the one, by far, that is the worst."

Another First

California was among the first states to remove sodas from public schools and to add calorie information to menu boards.

"California is often the first, and it's time for California to be the first again," said Harold Goldstein, executive director of the California Center for Public Health Advocacy.

Goldstein has been working with Monning's office on the health-warning legislation, saying it's a necessary step.

"The fundamental premise of a market economy is that consumers have truthful information about the products that they're going to purchase," he explained. "And right now the vast majority of information that consumers get about the beverages they're going to consume comes from billions of dollars of advertising from Coke and Pepsi and other Big Soda companies who spend that money to try to convince people, especially kids, (that soda is not harmful)."

Alicia Anthony/CrossFit Journal

CrossFit Inc. Founder and CEO Greg Glassman supports a warning label on sugary drinks because "they're poisoning our kids."

Meanwhile, diabetes is causing blindness and leading to limb amputation.

"The free market should not include the right to mislead consumers regarding the safety of any products," Monning stressed. "We don't take away the right to choice. We seek to inform."

> "I endeavor to give soda the well-deserved reputation that cigarettes and alcohol have."
>
> —Greg Glassman, CrossFit Founder and CEO

Among the measure's supporters is CrossFit Inc. Founder and CEO Greg Glassman, a self-described "rabid Libertarian."

"Though a Libertarian, I support warning labels on high-voltage lines, tobacco, alcohol, and soda. I'm OK with municipal limitations on advertising things considered antagonistic to the health and wellbeing of its citizenry."

In early November, Glassman is scheduled to visit a handful of affiliates throughout California to rally support for a health-warning-label bill in the state where CrossFit is headquartered.

"I think they're poisoning our kids and warning is needed," he said.

With such a label, Big Soda would no longer be able to co-opt health science or fitness, Glassman noted.

"The real value for me of the warning label is they can't subvert health sciences once the label's on the can the same way that Marlboro can't open a lung-cancer research hospital, and Jack Daniels isn't going to sell anyone on their drunk-driving research," he said. "Once that label's on there, I don't see how they can be players in the health sciences. I endeavor to give soda the well-deserved reputation that cigarettes and alcohol have." ■

About the Author

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THE CrossFit JOURNAL

CULTURE CLUB

What does your CrossFit affiliate say to members without saying a thing?

BY CHRIS COOPER

Robert Hull

Christine Wright

As a coach, how excited do you get about your members' PRs?

Anthony's truck sagged on the driver's side as it approached my parking lot.

The balding powerlifter had worn out its springs as surely as he'd worn out his welcome at every gym in town. And now it was my turn to send him away.

I met him in the parking lot and placed my hand on his door before he could get out.

When I opened my second gym in 2008, my ideal clientele didn't include powerlifters. But I thought my powerlifting buddies would be a good source of revenue: I had a reverse-hyperextension machine, glute-ham developers, chains and bands. I had expensive bars and a poster of Louie Simmons on my wall.

But the powerlifters didn't mix with the other members. They were loud and intimidating. Instead of leading average folks toward strength, they were condescending. They hit on my female clients while class was in session.

They didn't fit the culture I espoused, so I started to remove them from the gym.

Anthony was the first to go.

The parking-lot conversation was awkward, but I was resolute. As he drove away, he said, "I thought you were different, man."

He was right: I was different. While I had all the equipment, I wasn't running a powerlifting gym. I was running—and I still run—a CrossFit gym. The difference isn't the equipment but the culture.

Powerlifters, weightlifters and runners are all welcome here. Their goals outside the gym might be different, but the standard inside is the same: Make everyone else happier.

Powerlifters, weightlifters and runners are all welcome here. Their goals outside the gym might be different, but the standard inside is the same: Make everyone else happier. Failure to meet that standard is the only reason I've ever canceled a client's membership. Our Client Bill of Rights includes, "Be nice to everyone (except the coaches—you can be as mean as you like to them)."

As CrossFit culture changes fitness and bleeds into the mainstream, the spectrum of new clientele is broadening. On one end, the infirm grandmother looking to tie her own shoes is attracted to functional movement; on the other, weightlifters seeking platform space are attracted to access and equipment. And many gym owners would love to have both groups working in collaboration.

Is it possible?

Same Squat, Different Bar

Jason Williams was a founding partner of Thames CrossFit in London, England. He's also the owner of CrossFit Hale in Richmond, California. Though the gyms are on different sides of the planet, Williams says the culture is almost identical.

"There is a difference in demographic between the two. Thames is a younger, more athletic crowd, and Hale is slightly older, with young families—but the culture of both is surprisingly similar," he said. "It's a family-oriented environment. We tend to weed out ego/bravado in our screening and during our coaching of classes."One of the oldest affiliates in the U.K., CrossFit Thames has seen its culture evolve since the gym opened in 2009.

"It went through a darker period when we had folks who were a lot more interested in competition and advanced programming, etc.," Williams said. "We had to gently discourage this and in some cases push it away, as it wasn't serving the greater good.

"Now that we've focused on basic functional fitness, with scaling appropriate to athletes' levels, both our advanced and beginner athletes are much happier. Our barbecues and get-togethers are epic, and everyone just loves being there."

Lessons learned the hard way at Thames were avoided at Hale, and the newer box has been thriving from its start in 2013.

As many gym owners know, the culture of a facility can reflect the owner's personality. Williams is renowned locally for a relaxed-but-professional attitude, and his clients thrive in that environment.

"Ultimately, when people are getting results, learning something, enjoying the people around them and having fun, we know we are on the right track," Williams said.

You'll Know It When You Feel It

"They may forget what you said—but they will never forget how you made them feel," Carl W. Buehner said.

In other words, the perfect culture isn't seen but felt at CrossFit affiliates.

I want every CrossFit Catalyst client to leave happier than when he or she arrives. That's the goal we repeat with our coaches at almost every meeting. Our original slogan—"Inspiration and Education"—now takes a back seat to our motto: "Exercise until you're happy." Coaches are selected based on consistency and happiness rather than knowledge. I can teach coaches to fix squats, but I can't fix personality.

At CrossFit Catalyst, the culture reflects the personality of my ideal client. We created our space and its atmosphere for the people we want to attract, please and retain. I talk about target markets and demographics with owners of other gyms on a daily basis, and I've learned that you can't be everything to everyone. When a new client doesn't fit, we don't chase him.

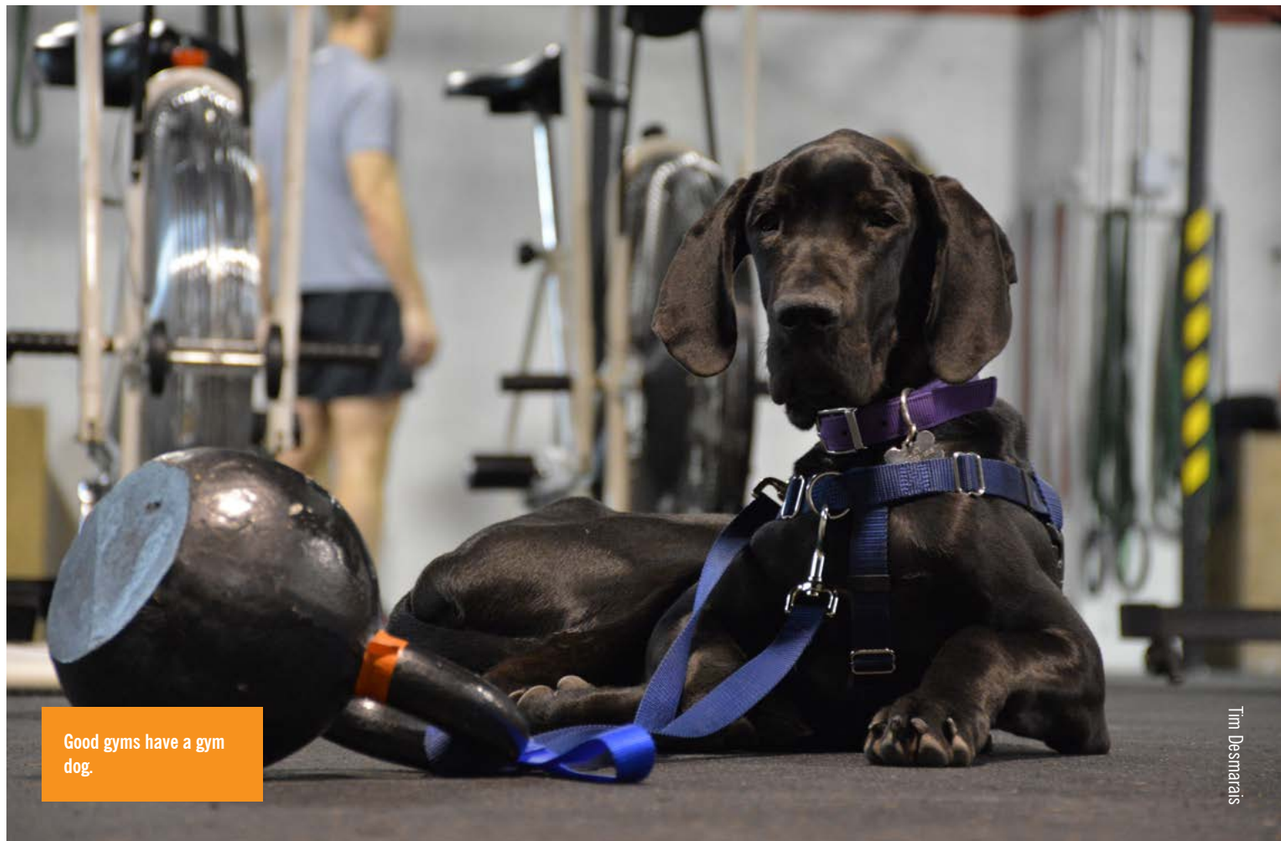
Once, my head coach—a lively 24-year-old with an encyclopedic knowledge of movement—was turned down as a trainer by a 16-year-old boy, and she felt guilty for not "closing the sale." Ten years ago, I might have stressed over the point. But after witnessing the ideal culture for several years, I was confident in saying, "Charity, if he doesn't want you as a coach, we don't want him as a client."

Culture can also change by group: Though every client is a CrossFit Catalyst client, the 6-p.m. group has a different personality than the morning crews. Primarily women who have just finished their workday, the 6-p.m. athletes are motivated differently than the athletes I meet at sunrise.

A few months ago, I took a turn coaching the 6-p.m. class. In my usual fashion, I introduced the workout with a talk about leverage and torque and how deadlifting would benefit them. Then I walked them through the metabolic benefits of the sprints and rope climbs. The noon group loves to know why they're doing things; this group just stared coolly at me.

An affiliate's culture is defined by much more than the programming. Sometimes it's defined by dresses and tutus.

Kendall Ashley Photography



Good gyms have a gym dog.

Tim Desmarais

"When will Taryn be back?" one asked.

I humbly started the clock and a Taylor Swift remix, and then I smiled for 30 minutes straight.

Filtering for Character

In the words of CrossFit Founder and CEO Greg Glassman, "We're forging elite fitness, but we're filtering for character."

Who do I want to coach? It's not the elite-level powerlifter. It's the elite-level grandma who hugs me in our noon group. It's the skinny guy learning to squat before he returns to the job site. We can accommodate the elite powerlifter, too, but only if he fits in with our crew. If he does, he's on the team.

As our culture matures, it's not uncommon for members to say, "Good game, good game!" or "See you all at recess tomorrow!" as they shake hands with each other. That's our culture, and it's the most important thing in our gym. If a member's technique isn't perfect today, I can fix it tomorrow. If the culture is right, I'll have 10 years to make him better. Our longest-served client has been with us for 13 years; five more will reach the 10-year mark in September.

Can culture be shaped? I believe the best parts of a box culture can be reinforced. I praise members publicly when they help one another. I share jokes and funny stories. We brag up personal bests and call members when they reach new podiums. I correct only in private. This approach amplifies our wins and hides our challenges, and we all move toward "happy" together.

Watching Anthony drive away in 2008 was painful. I needed clients and money.

But what I really needed was to create the culture that would lead to both.

Now, my clients depend on me to preserve at all costs a culture of education and inspiration. They need me to be the filter. And I'm up for it. I'll turn away people like Anthony, hire people like Charity and ensure the atmosphere at the gym is exactly how it needs to be. ■

About the Author:

Chris Cooper owns CrossFit Catalyst in Sault Ste. Marie, Ontario. He's the author of "Two-Brain Business," "Two-Brain Business 2.0" and "Help First." He's great at high-fives and is working to improve his hugging.

Robert Croot

When you're a coach, fostering the right culture at your gym might mean dressing up as a leprechaun.

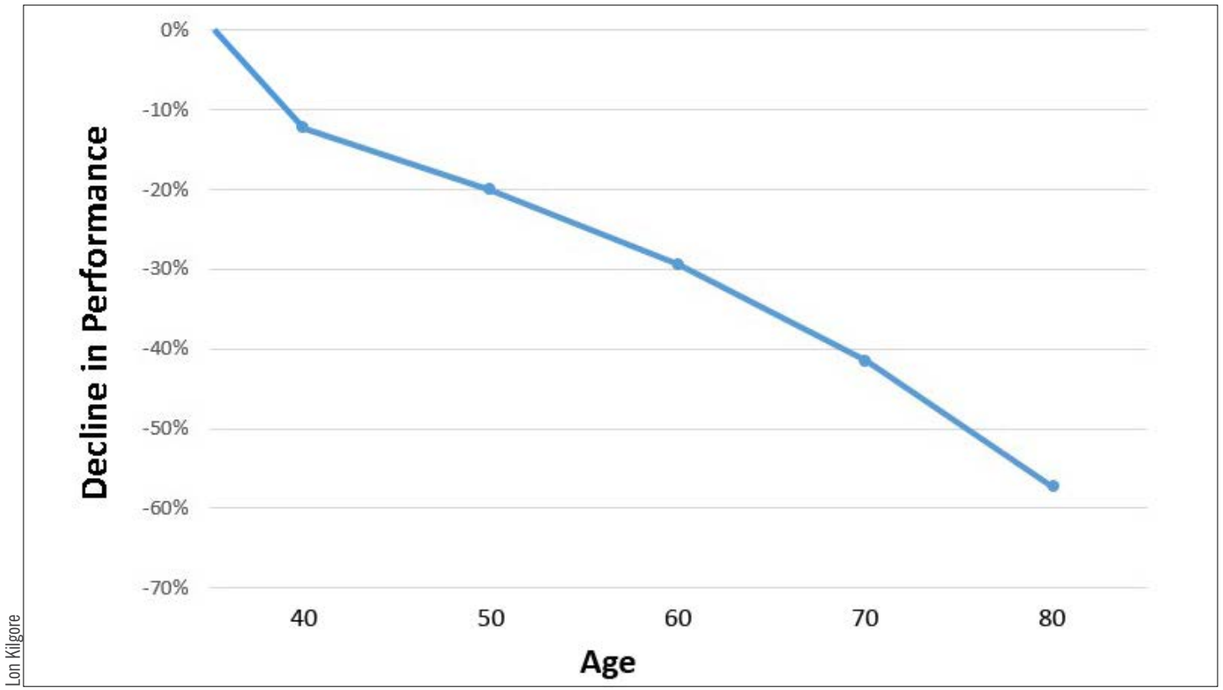
THE CrossFit JOURNAL

AGING, PERFORMANCE AND HEALTH

BY LON KILGORE

While physical capacity inevitably declines as athletes age, fitness has dramatic effects on health and quality of life.

Mike Warkentin/CrossFit Journal



Lon Kilgore

Figure 1: Decline in record performance (representing loss of fitness capacity) over time. Competitive records for 16 different sport disciplines for each age group—open division through over 80 years of age—are plotted, and the reduction is expressed as a percentage of the open world record.

Category	Age 40	50	60	70	80
Heavy Power	-25%	-35%	-44%	-54%	-69%
Endurance	-7%	-18%	-29%	-45%	-64%
Strength	-13%	-16%	-29%	-44%	-57%
Speed	-9%	-16%	-25%	-37%	-58%
Power Speed	-13%	-23%	-31%	-41%	-50%
Light Power	-5%	-14%	-20%	-29%	-46%
Mean Loss	-12%	-20%	-29%	-42%	-57%

Table 1: Comparative loss of performance capacity over time from highest cumulative loss to lowest. World records for each age group—over-40 division through over 80 years of age—are expressed as a percentage of the world open record lost with age.

"How much should I be lifting?"

It's probable every coach or trainer has been asked this question, and the query is usually qualified with variables including age, body weight and so on.

We as trainees, and humans in general, really like to compare what we can do with what other people can do, so we create standards for many common exercises. A standard is what we can realistically expect of someone with specific characteristics—sex, age, training experience—in a particular exercise. Sadly, few authoritative sources exist, and we can only strive to provide a relatively close approximation to help the trainee evaluate his or her performance and set goals.

When asked to provide performance standards, coaches must rely on a very limited data set in the literature, their own experience in training, observations of the people they train and pseudo-mathematical estimation. In many instances there is no referential data for an exercise in the literature, so that leaves only experience, observation and estimation.

The largest set of paying customers in the fitness industry is made up of people over 30, and this group is most often interested in how their newfound fitness levels stack up with people their own age. We see this in the 2015 industry report "The Wellness Deficit: Millennials and Health in America," in which almost two-thirds of the surveyed population said it is important to track and monitor their fitness progress. CrossFit, of course, is driven by data, and few trainees ignore whiteboards and logbooks.

So what can we expect for ourselves and our clients in terms of performance as we age?

Estimating Performance Loss

When we age, we lose fitness capacity. That loss is compounded if we do not train. But if we do train hard and intelligently, we can abate that loss even if we can't eliminate it completely.

These facts simply mean a standard for a 30-year-old trainee cannot fairly be applied to someone who is 40, 53, 67, 88 or any other older age, so we need to figure out how much fitness will be lost over time and adjust our expectations accordingly.

We can begin to get a handle on things if we take a cumulative look at how human performance in a variety of athletic events decays over the lifespan. By combining the open world records for a spectrum of events and comparing them to the master's world records for the same spectrum of athletic events—proposed here as a representation of comprehensive fitness—we should be able to get a feel for how overall fitness behaves over time.

Figure 1 tracks the loss of fitness capacity by plotting world records across all ages from open competition to octogenarians. As we would expect, performances tend to decline as we get older. Compared to open competitive records, performances decay by a little more or less than 10 percent per decade until the 70s, when fitness capacity drops 13 percent, and the 80s, when it drops 15 percent. Overall, by the time an athlete reaches his or her 80s, he or she will have lost approximately 57 percent of overall performance capacity.

We can take various records that represent various aspects of fitness and try to discriminate which elements of fitness are more persistent and which are lost faster or to a larger degree. We put maximal strength on one end and endurance on the other end. All other categories are arranged by similarity to those at the two ends of the spectrum.

Maximal strength—squat, bench press, deadlift.
Heavy power—snatch, clean and jerk.
Light power—shot put, discus, hammer.
Power speed—high jump, long jump.
Speed—100-, 200- and 400-m sprint.
Endurance—1,500-, 5,000- and 10,000-m run.

If we arrange the performances in the events above into a table that stratifies by the amount of performance capacity lost by category, you arrive at Table 1.

Heavy power activities—the Olympic lifts—behave differently in the first decade after the open-division records when compared to other events. The first thing you'll note in the table is that Olympic-lift performance takes a huge hit immediately, dropping 25 percent by the age of 40. That's twice the average decay and up to five times the rate of decay for other categories. This is curious, as maximal strength, speed, power speed and light power are thought to be closely related to heavy power, and these other categories had much better performance-capacity retention. Could the advanced mobility demands of the Olympic lifts contribute to the rapid decay or is there another factor in play?

It is interesting that power speed (high jump, long jump) and light power (shot, discus, hammer) are the best-preserved physical capacities. Jumping and throwing are fundamental human movements, but are they biologically more important than lifting or running?

We can't answer that with available information.

Physical Activity, Health and Quality of Life

We strive to make informed decisions about loading and expectations for our trainees, so we need to understand that a trainee is quite capable of improving fitness levels to a significant degree regardless of age. There are reports of octogenarians improving their strength by up to 200 percent, and virtually all resistance-training studies produce results that show positive effects on fitness and quality of life (1).

But if the data above are an indication, there are limits to how much fitness can be gained as athletes advance in age. Therefore, we need to exercise caution and not lead our trainees to expect elite performances in any age group. When we look at the normal distribution for physical activity and exercise habits, only 1 percent reach the level of performance that could be considered elite—but remember that you don't have to set a world record or even win a big event to be elite. Similarly, you don't have to be elite to reap the death-repelling benefits of training.

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If we consider the epidemiology of inactivity, we come up with the following estimations of training progression:

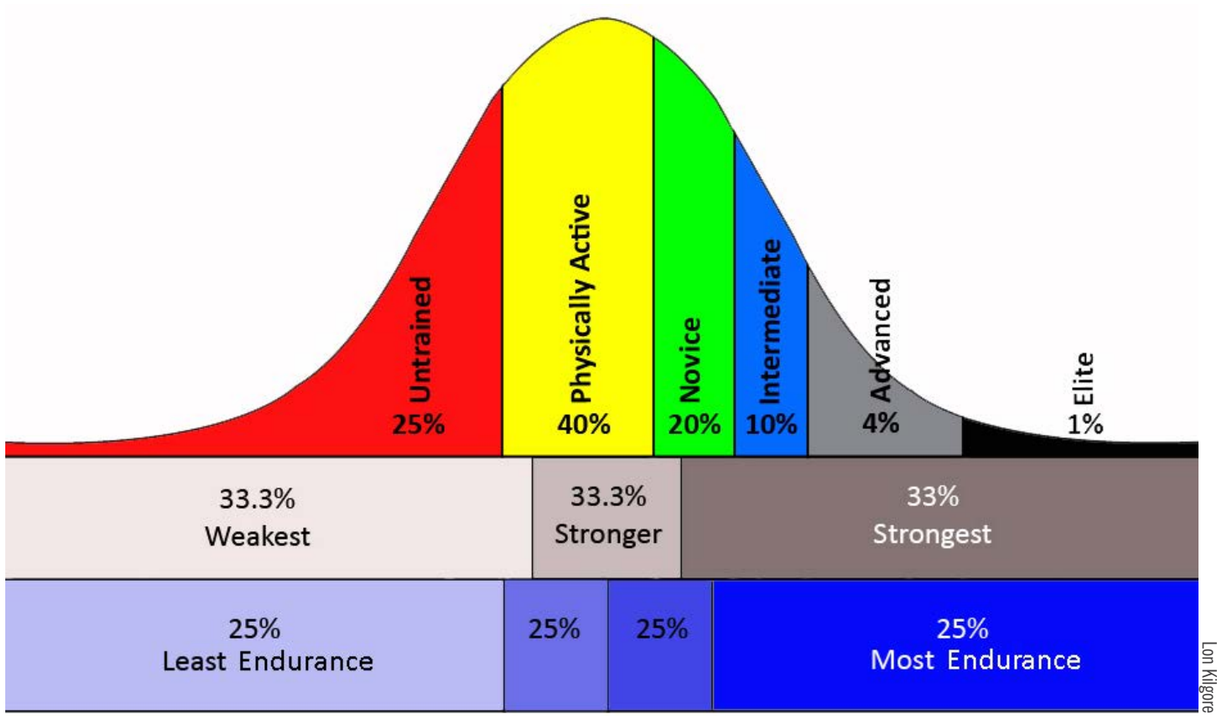
- Physically inactive—25 percent of the population (no movement above minimal).
- Physically active—40 percent of the population (a person with some level of movement above normal workday levels for a cumulate 30 minutes per day three to five days per week).
- Novice trainee—20 percent of the population (actual beginner who trains regularly to improve fitness).
- Intermediate trainee—10 percent of the population.
- Advanced trainee—4 percent of the population.
- Elite trainee—1 percent of the population.

Due to their physical training, many older athletes have fitness levels well above those of much younger people.

Matthew Townsend

Colleen Baz

Good news: When sedentary individuals become active, fitness levels increase regardless of age.



Lon Kilgore

Figure 2: Estimated distribution of the population by fitness progression. With respect to mortality, individuals who are in the upper two-thirds of the population in strength die from all causes at a lower frequency than those in the weakest third. Similarly, those in the lowest quarter of endurance have a significantly increased risk of death from all causes.

Note that these are the author's approximations based on experience, published papers on prevalence of exercise participation and inference.

If we overlay this distribution across the epidemiological data about strength and mortality and endurance and mortality, we can roughly determine the level of fitness needed to maximize the risk-abatement effects of exercise (Figure 2).

Those individuals who are untrained and perform neither physical activity nor exercise have the highest risk of death from all causes because they are the weakest and least enduring of the species. Once a person becomes physically active—meaning he or she just moves regularly by doing things like taking the stairs, walking around a mall or doing anything that elevates metabolism above baseline for an accumulated 30 minutes per day—he or she will experience a significant reduction in risk of death. While this is an improvement in general health, the person will not reap a significant fitness benefit from these relatively low levels of activity.

The best results for reducing premature death are found in the upper third of the population in strength and the upper quarter in endurance. That level of capacity begins at the upper end of the novice performance standard and extends through elite.

Even though risk of death does not significantly change between intermediate and elite, the higher the category reached, the higher the physical function in the real world—meaning the potential for higher quality of life grows with fitness improvement. That's why we strive to make our trainees more fit; we seek not only to improve health and prevent death but also to improve quality of life.

If we seek only the biggest bang for the buck, being physically active is likely enough in terms of health benefits. But it's really not enough, and this is where definitions are important. If you consider the absence of disease as the primary criteria for "health"—health is avoidance of disease and death—then being physically active might suffice. That is precisely the tack of the American College of Sports Medicine and other medical interests.

Alicia Anthony/CrossFit Journal

At any age, very few athletes will reach the elite level. Nevertheless, those at higher levels of fitness will be healthier while enjoying a very high quality of life characterized by vitality and independence.

But being healthy—no disease—while functionally impaired in strength, endurance and mobility is just as problematic as ill health. Health without function is simply not especially rewarding. As trainers, we want our trainees to grow in function inside the gym and out. By pushing for higher levels of fitness, we improve their abilities not only in the gym but also at work, home and play, which improves quality of life.

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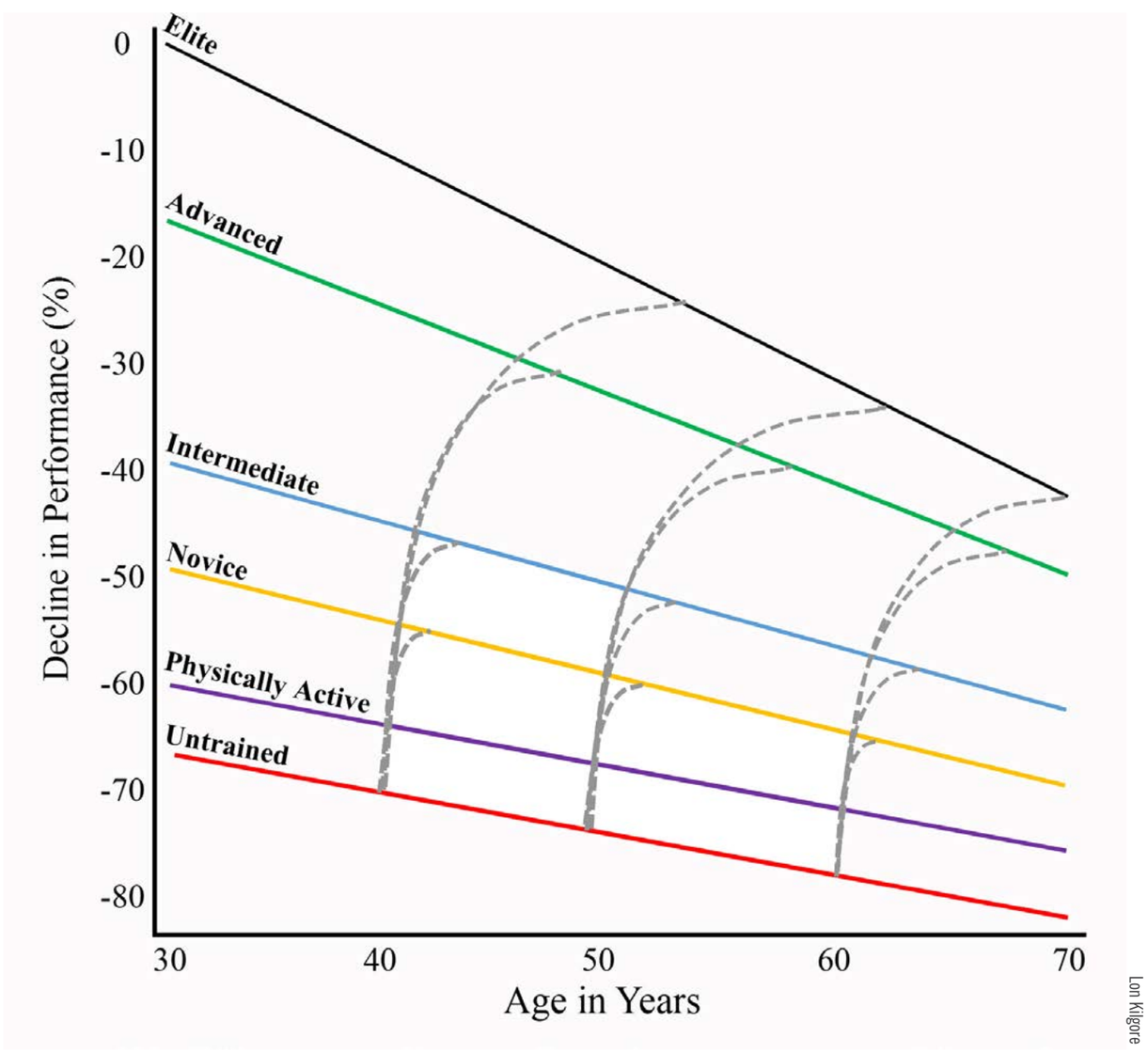
Range of motion, agility, balance and coordination can all affect quality of life, but their relationship to mortality across the lifespan is not well known, and thus they are not included in Figure 2. While we do have informative data that can help guide us with respect to strength and endurance, there is virtually no data suggesting an across-lifespan relationship between mortality rates and mobility. Numerous studies suggest lower levels of mobility—such as shortened walking gait and inferior balance—are associated with early death, but the relationship is unknown at younger ages as research is generally focused on people 70 or older.

So how do we put Figure 2 into the context of aging? Well, the distribution pattern stays the same; all that changes is the performance level that dictates the classification of athletes.

If you peruse Figure 3, you will note that the slope of performance loss is shallower when a person is at a lower level of training progression. For example, elites will lose more fitness as they age, while untrained people will lose less, but it's important to remember untrained people don't have much fitness to lose in the first place. Any loss of fitness in the lowest stratifications—the



Lon Kilgore

Figure 3: A proposed relationship of the varied levels of training progression (untrained through elite) and the slope of performance decay (from mean loss in Table 1) over a lifespan. Note that one can begin training or alter training to move up in level of fitness at any time. This concept is illustrated with the grey dashed lines. It is thought that movement from untrained to novice levels can occur in a matter of a few months. Moving from untrained to intermediate levels of performance can take about two years of consistent training. Reaching the advanced level may take about four to five years, and it is often proposed that reaching the elite level is generally the result of approximately a decade's worth of systematic training.

untrained and physically active—can be catastrophic because small losses still eat away at their extant meager performance and significantly reduce their quality and quantity of life. The higher the fitness level achieved through training, the more functionality will be retained as we age—and it's never too late to start.

While inevitable performance declines might seem somewhat depressing at first glance to the aging trainee and especially to hard-charging masters athletes, they needn't be. Our perspective can be on performance or it can simply be on maintaining health and quality of life, to include pain-free activity, vitality and preserved functionality. Higher levels of fitness provide a buffer from decrepitude, and older trainees, regardless of goal, will be rewarded with a higher quality of life—even if world records and previous lifetime-best performances are no longer attainable.

For any older trainee who is not as fit as he or she would like to be or could be, you will note that potential for gain exists throughout each decade of life. An untrained individual can begin training and within a couple of years reach the intermediate level, reaping the lower mortality risk and improved quality of life associated with improved function through fitness. Moving to the elite level, if possible for the individual, may take a decade or more of regular training. The longer you wait to start training, the less likely it is you will reach your genetic potential, but fitness can be improved at any age. All you need to do is to commit to getting off the couch and to the gym—frequently and regularly.

Finally, and perhaps most importantly, while we see more dramatic performance declines in elite and advanced fitness with aging (Figure 3) than we see in lower categories, those declines still leave fitness levels above those seen in younger populations. If you reach elite fitness at 70, you are doing about as well in terms of function as a 30-year-old intermediate. If you are an intermediate 70-year-old, you are doing about as well as a physically active 30-year-old. So age is not a reason to give up on fitness or sports performance. Although the data point out the inevitability of fitness decay, older trainees and masters athletes remain capable of very impressive things. You need only watch the masters competition at the CrossFit Games or poke your head into a CrossFit affiliate for proof.

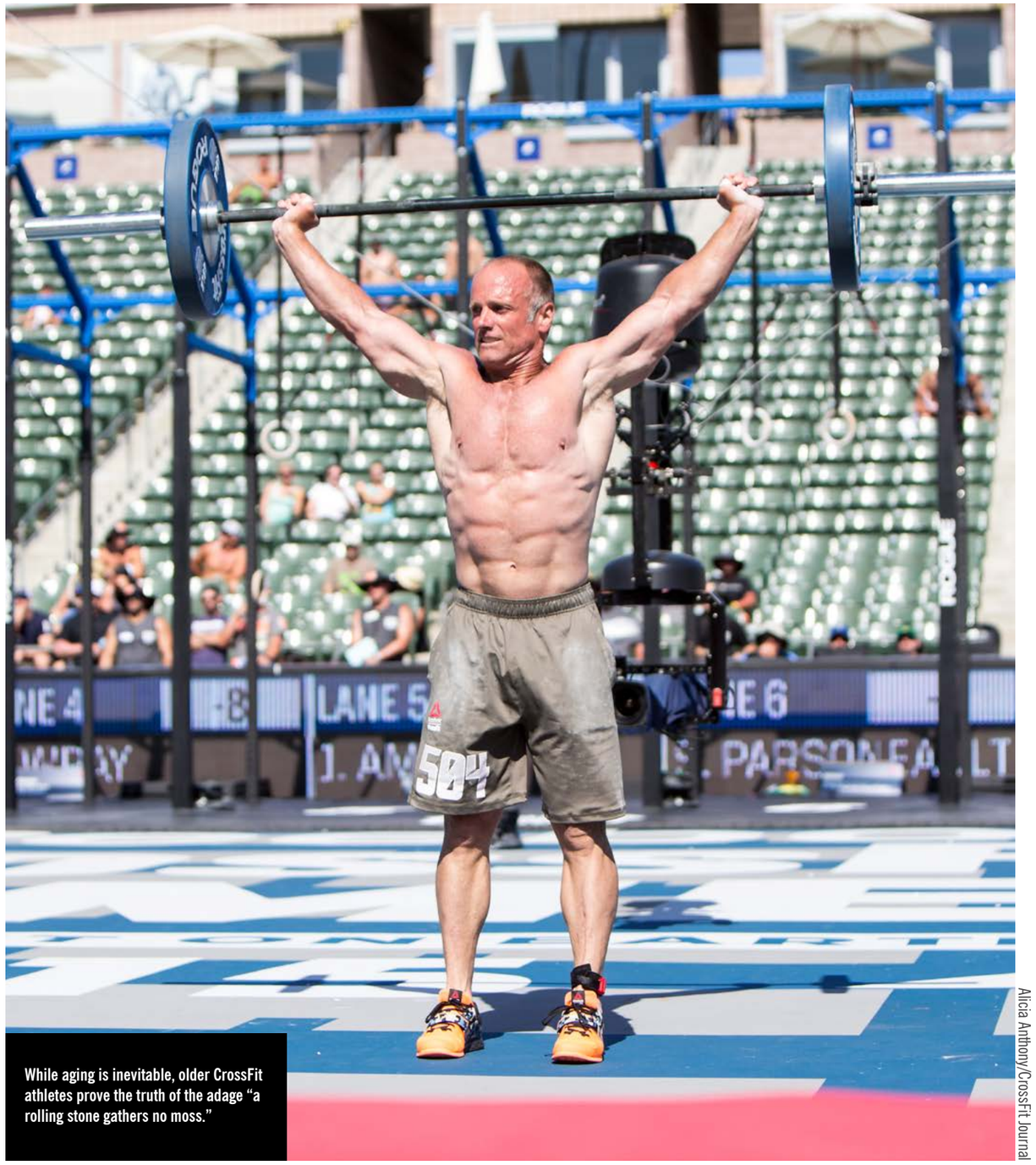
As it turns out, getting fit is as close to a fountain of youth as we can get. ■

References

1. Latham NK, Bennett DA, Stretton CM, Anderson CS. Systematic review of progressive resistance strength training in older adults. *The Journals of Gerontology Series A Biological Sciences and Medical Sciences* 59(1): 48–61, 2004.

About the Author

Lon Kilgore earned a Ph.D. from the Department of Anatomy and Physiology at Kansas State University's College of Veterinary Medicine. He has competed in weightlifting to the national level since 1972 and coached his first athletes from a garage gym to national-championship event medals in 1974. He has also competed in powerlifting, the first CrossFit Total event, wrestling and rowing. He has worked in the trenches, as a qualified national-level coach or scientific consultant, with athletes from rank novices to the Olympic elite, and as a consultant to fitness businesses. He was co-developer of the Basic Barbell Training and Exercise Science specialty seminars for CrossFit (mid-2000s) and was an all-level certifying instructor for USA Weightlifting for more than a decade. He is a decorated military veteran (sergeant, U.S. Army). His illustration, authorship and co-authorship efforts include several bestselling books and works in numerous research journals. After a 20-year professorial career in higher academia, he currently delivers vocational-education courses through the Kilgore Academy, provides online commentary and analysis of exercise-science papers, and works as a writer and illustrator. His fitness standards have been included in textbooks and numerous websites. You can download free PDFs of his standards here.



While aging is inevitable, older CrossFit athletes prove the truth of the adage "a rolling stone gathers no moss."

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