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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.

2. 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.

Kehdra 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.

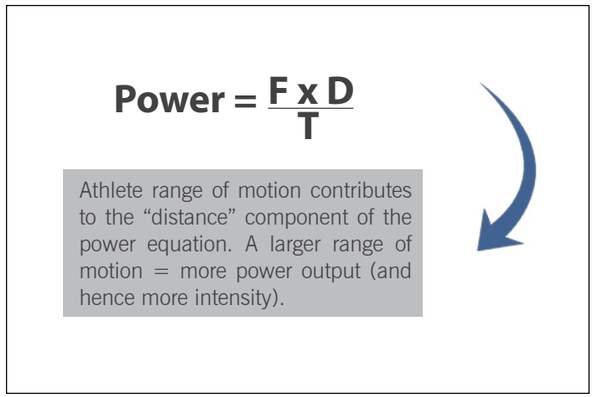

Figure 1: Range of motion affects power and, therefore, intensity.

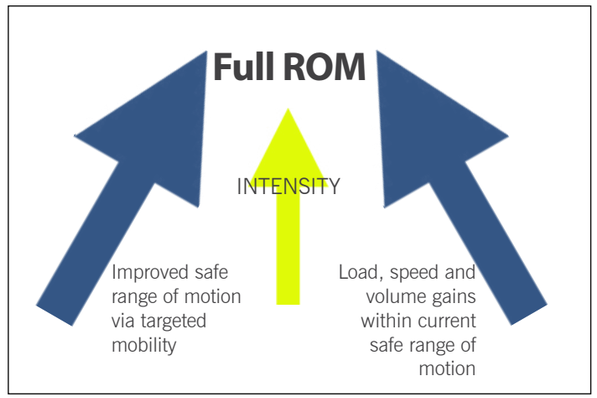

Figure 2: Long-term plan to increase intensity and range of motion.

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 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.