The CrossFit Level 1 Training Guide is a collection of CrossFit Journal articles written since 2002 primarily by CrossFit CEO and founder Coach Greg Glassman (“Coach Glassman”) on the foundational movements and methodology of CrossFit. The Level 1 Certificate Course is CrossFit’s cornerstone seminar, which has allowed thousands to begin their careers as CrossFit Trainers.

This Guide is designed to be used in conjunction with the Level 1 Course to develop the participant’s knowledge and trainer skills, as well as prepare him or her for the Level 1 test. This is an essential but not an exhaustive resource. Some of the knowledge required to pass the test comes from these articles; the other material comes directly from the two-day course.

Some edits to the original articles have been made for the Training Guide to flow as a stand-alone reference, provide context for readers, as well stay current with the course format. All original works are preserved in the CrossFit Journal and hotlinks (noted by their blue color) are provided throughout.

No seminar other than the CrossFit Level 1 Certificate Course, as run by CrossFit, grants you the title of a “CrossFit” Trainer. Official events can only be verified by using CrossFit.com for registration or by emailing seminars@crossfit.com with your inquiry. Official qualifications for any individual can be verified in our Trainer Directory.

If any affiliate or other fitness organization claims that an individual needs to take their course to be an affiliate or as a prerequisite/introduction to taking our Level 1 Certificate Course, they are a scam. These individuals or organizations should be reported to iptheft.crossfit.com.
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The aims, prescription, methodology, implementation, and adaptations of CrossFit are collectively and individually unique, defining of CrossFit, and instrumental in our program's successes in diverse applications.

Aims
From the beginning, the aim of CrossFit has been to forge a broad, general, and inclusive fitness. We sought to build a program that would best prepare trainees for any physical contingency—prepare them not only for the unknown but for the unknowable. Looking at all sport and physical tasks collectively, we asked what physical skills and adaptations would most universally lend themselves to performance advantage. Capacity culled from the intersection of all sports demands would quite logically lend itself well to all sport. In sum, our specialty is not specializing.

Prescription
CrossFit is "constantly varied, high-intensity, functional movement." This is our prescription. Functional movements are universal motor recruitment patterns; they are performed in a wave of contraction from core to extremity; and they are compound movements—i.e., they are multi-joint. They are natural, effective, and efficient locomotors of body and external objects. But no aspect of functional movements is more important than their capacity to move large loads over long distances, and to do so quickly. Collectively, these three attributes (load, distance, and speed) uniquely qualify functional movements for the production of high-power. Intensity is defined exactly as power, and intensity is the independent variable most commonly associated with maximizing the rate of return of favorable adaptation to exercise. Recognizing that the breadth and depth of a program's stimulus will determine the breadth and depth of the adaptation it elicits, our prescription of functionality and intensity is constantly varied. We believe that preparation for random physical challenges—i.e., unknown and unknowable events—is at odds with fixed, predictable, and routine regimens.

Methodology
The methodology that drives CrossFit is entirely empirical. We believe that meaningful statements about safety, efficacy, and efficiency, the three most important and
interdependent facets to evaluate any fitness program, can be supported only by measurable, observable, repeatable data. We call this approach “evidence-based fitness.” CrossFit’s methodology depends on full disclosure of methods, results, and criticisms, and we have employed the Internet to support these values. Our charter is open source, making co-developers out of participating coaches, athletes, and trainers through a spontaneous and collaborative online community. CrossFit is empirically driven, clinically tested, and community developed.

Implementation

“We’ve taken high intensity, constantly varied, functional workouts and distilled load, range of motion, exercise, power, work, line of action, flexibility, speed, and all pertinent metabolics to a single value—usually time. This is the sport of fitness. We’re best at it.”

-Coach Glassman

In implementation, CrossFit is, quite simply, a sport—the “sport of fitness.” We have learned that harnessing the natural camaraderie, competition, and fun of sport or game yields an intensity that cannot be matched by other means. The late Col. Jeff Cooper observed that “the fear of sporting failure is worse than the fear of death.” It is our observation that men will die for points. Using whiteboards as scoreboards, keeping accurate scores and records, running a clock, and precisely defining the rules and standards for performance, we not only motivate unprecedented output but derive both relative and absolute metrics at every workout; this data has important value well beyond motivation.

Adaptations

Our commitment to evidence-based fitness, publicly posting performance data, co-developing our program in collaboration with other coaches, and our open-source charter in general has well positioned us to garner important lessons from our program—to learn precisely and accurately, that is, about the adaptations elicited by CrossFit programming. What we have discovered is that CrossFit increases work capacity across broad time and modal domains (see “What is Fitness? (Part 2)” article). This is a discovery of great import and has come to motivate our programming and refocus our efforts. This far-reaching increase in work capacity supports our initially stated aims of building a broad, general, and inclusive fitness program. It also explains the wide variety of sport demands met by CrossFit as evidenced by our deep penetration among diverse sports and endeavors. We have come to see increased work capacity as the Holy Grail of performance improvement and all other common metrics like VO\textsubscript{2} max, lactate threshold, body composition, and even strength and flexibility as being correlates–derivatives, even. We would not trade improvements in any other fitness metric for a decrease in work capacity.

Conclusions

The modest start of publicly posting our daily workouts on the Internet beginning in 2001 has evolved into a community where human performance is measured and publicly recorded against multiple, diverse, and fixed workloads. CrossFit is an open-source engine where inputs from any quarter can be publicly given to demonstrate fitness and fitness programming, and where coaches, trainers, and athletes can collectively advance the art and science of optimizing human performance.
CrossFit is a core strength and conditioning program. Originally published in April 2002. We have designed our program to elicit as broad an adaptational response as possible. CrossFit is not a specialized fitness program but a deliberate attempt to optimize physical competence in each of 10 fitness domains. They are cardiovascular/respiratory endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance, and accuracy.

CrossFit was developed to enhance an individual’s competency at all physical tasks. Our athletes are trained to perform successfully at multiple, diverse, and randomized physical challenges. This fitness is demanded of military and police personnel, firefighters, and many sports requiring total or complete physical prowess. CrossFit has proven effective in these arenas.

Aside from the breadth or totality of fitness CrossFit seeks, our program is distinctive, if not unique, in its focus on maximizing neuroendocrine response, developing power, cross-training with multiple training modalities, constant training and practice with functional movements, and the development of successful diet strategies.
Our athletes are trained to bike, run, swim, and row at short, middle, and long distances, guaranteeing exposure and competency in each of the three main metabolic pathways.

We train our athletes in gymnastics from rudimentary to advanced movements, garnering great capacity at controlling the body both dynamically and statically while maximizing strength-to-weight ratio and flexibility. We also place a heavy emphasis on Olympic weightlifting, having seen this sport’s unique ability to develop an athlete’s explosive power, control of external objects, and mastery of critical motor recruitment patterns. And finally we encourage and assist our athletes to explore a variety of sports as a vehicle to express and apply their fitness.

“Be impressed by intensity, not volume.”

- Coach Glassman

An Effective Approach
In gyms and health clubs throughout the world the typical workout consists of isolation movements and extended aerobic sessions. The fitness community from trainers to the magazines has the exercising public believing that lateral raises, curls, leg extensions, sit-ups and the like combined with 20-40 minute stints on the stationary bike or treadmill are going to lead to some kind of great fitness. Well, at CrossFit we work exclusively with compound movements and shorter high-intensity cardiovascular sessions. We have replaced the lateral raise with push presses, the curl with pull-ups, and the leg extension with squats. For every long distance effort our athletes will do five or six at short distance. Why? Because functional movements and high-intensity are radically more effective at eliciting nearly any desired fitness result. Startlingly, this is not a matter of opinion but solid, irrefutable scientific fact, and yet the marginally effective old ways persist and are nearly universal. Our approach is consistent with what is practiced in elite training programs associated with major university athletic teams and professional sports. CrossFit endeavors to bring state-of-the-art coaching techniques to the general public and athlete.

Is This For Me?
Absolutely! Your needs and the Olympic athlete’s differ by degree not kind. Increased power, speed, strength, cardiovascular and respiratory endurance, flexibility, stamina, coordination, agility, balance, and accuracy are each important to the world’s best athletes and to our grandparents. The amazing truth is that the very same methods that elicit optimal response in the Olympic or professional athlete will optimize the same response in
the elderly. Of course, we cannot load your grandmother with the same squatting weight that we would assign an Olympic skier, but they both need to squat. In fact, squatting is essential to maintaining functional independence and improving fitness. Squatting is just one example of a movement that is universally valuable and essential yet rarely taught to any but the most advanced of athletes. This is a tragedy. Through painstakingly thorough coaching and incremental load assignment CrossFit has been able to teach everyone who can care for themselves to perform safely and with maximum efficacy the same movements typically utilized by professional coaches in elite and certainly exclusive environments.

Who Has Benefited From CrossFit?
Many professional and elite athletes are participating in CrossFit. Prize-fighters, cyclists, surfers, skiers, tennis players, triathletes and others competing at the highest levels are using CrossFit to advance their core strength and conditioning, but that is not all. CrossFit has tested its methods on the sedentary, overweight, pathological, and elderly and found that these special populations met the same success as our stable of athletes. We call this “ bracketing.” If our program works for Olympic skiers and overweight, sedentary homemakers then it will work for you.

Your Current Regimen
If your current routine looks somewhat like what we have described as typical of the fitness magazines and gyms, do not despair. Any exercise is better than none, and you have not wasted your time. In fact, the aerobic exercise that you have been doing is an essential foundation to fitness and the isolation movements have given you some degree of strength. You are in good company; we have found that some of the world’s best athletes were sorely lacking in their core strength and conditioning. It is hard to believe but many elite athletes have achieved international success and are still far from their potential because they have not had the benefit of state-of-the-art coaching methods.

Just What Is A “Core Strength and Conditioning” Program?
CrossFit is a core strength and conditioning program in two distinct senses. First, we are a core strength and conditioning program in the sense that the fitness we develop is foundational to all other athletic needs. This is the same sense in which the university courses required of a particular major are called the “core curriculum.” This is the stuff that everyone needs. Second, we are a “core” strength and conditioning program in the literal sense meaning the center of something. Much of our work focuses on the major functional axis of the human body, the extension and flexion of the hips and torso or trunk. The primacy of core strength and conditioning in this sense is supported by the simple observation that powerful hip extension alone is necessary and nearly sufficient for elite athletic performance. That is, our experience has been that
no one without the capacity for powerful hip extension enjoys great athletic prowess and nearly everyone we have met with that capacity was a great athlete. Running, jumping, punching, and throwing all originate at the core. At CrossFit we endeavor to develop our athletes from the inside out, from core to extremity, which is, by the way, how good functional movements recruit muscle, from the core to the extremities.

Can I Enjoy Optimal Health Without Being An Athlete?
No! Athletes experience a protection from the ravages of aging and disease that non-athletes never find. For instance, 80-year-old athletes are stronger than non-athletes in their prime at 25 years old. If you think that strength is not important consider that strength loss is what puts people in nursing homes. Athletes have greater bone density, stronger immune systems, less coronary heart disease, reduced cancer risk, fewer strokes, and less depression than non-athletes.

What Is An Athlete?
According to Merriam Webster’s Dictionary, an athlete is “a person who is trained or skilled in exercises, sports, or games requiring physical strength, agility, or stamina.”

The CrossFit definition of an athlete is a bit tighter. The CrossFit definition of an athlete is “a person who is trained or skilled in strength, power, balance and agility, flexibility, and endurance.” CrossFit holds “fitness,” “health”, and “athleticism” as strongly overlapping constructs. For most purposes, they can be seen as equivalents.

What If I Do Not Want To Be An Athlete; I Just Want To Be Healthy?
You are in luck. We hear this often, but the truth is that fitness, wellness, and pathology (sickness) are measures of the same entity: your health. There are a multitude of measurable parameters that can be ordered from sick (pathological) to well (normal) to fit (better than normal). These include but are not limited to blood pressure, cholesterol, heart rate, body fat, muscle mass, flexibility, and strength. It seems as though all of the body functions that can go awry have states that are pathological, normal, and exceptional and that elite athletes typically show these parameters in the exceptional range. CrossFit’s view is that fitness and health are the same thing (see “What is Fitness?” article). It is also interesting to notice that the health professional maintains your health with drugs and surgery, each with potentially undesirable side effects, whereas the CrossFit Trainer typically achieves a superior result always with “side benefit” vs. side effect.

Examples Of CrossFit Exercises
Biking, running, swimming, and rowing in an endless variety of drills. The clean and jerk, snatch, squat, deadlift, push press, bench press, and power clean. Jumping, medicine ball throws and catches, pull-ups, dips, push-ups, handstands, presses to handstand, pirouettes,
kips, cartwheels, muscle-ups, sit-ups, scales, and holds. We make regular use of bikes, the track, rowing shells and ergometers, Olympic weight sets, rings, parallel bars, free exercise mat, horizontal bar, plyometrics boxes, medicine balls, and jump rope.

There is not a strength and conditioning program anywhere that works with a greater diversity of tools, modalities, and drills.

**What If I Do Not Have Time For All Of This?**

It is a common sentiment to feel that because of the obligations of career and family that you do not have the time to become as fit as you might like. Here is the good news: world class age group strength and conditioning is obtainable through an hour a day six days per week of training. It turns out that the intensity of training that optimizes physical conditioning is not sustainable past 45 minutes to an hour. Athletes that train for hours a day are developing skill or training for sports that include adaptations inconsistent with elite strength and conditioning. Past one hour, more is not better!

**“Fringe Athletes”**

There is a near universal misconception that long distance athletes are fitter that their short distance counterparts. The triathlete, cyclist, and marathoner are often regarded as among the fittest athletes on Earth. Nothing could be farther from the truth. The endurance athlete has trained long past any cardiovascular health benefit and has lost ground in strength, speed, and power, typically does nothing for coordination, agility, balance, and accuracy, and possesses little more than average flexibility. This is hardly the stuff of elite athleticism. The CrossFit athlete, remember, has trained and practiced for optimal physical competence in all 10 physical skills (cardiovascular/respiratory endurance, stamina, flexibility, strength, power, speed, coordination, agility, balance, and accuracy). The excessive aerobic volume of the endurance athlete’s training has cost him in speed, power, and strength to the point where his athletic competency has been compromised. No triathlete is in ideal shape to wrestle, box, pole-vault, sprint, play any ball sport, fight fires, or do police work. Each of these requires a fitness level far beyond the needs of the endurance athlete. None of this suggests that being a marathoner, triathlete or other endurance athlete is a bad thing; just do not believe that training as a long distance athlete gives you the fitness that is prerequisite to many sports. CrossFit considers the sumo wrestler, triathlete, marathoner, and power lifter to be “fringe athletes” in that their fitness demands are so specialized as to be inconsistent with the adaptations that give maximum competency at all physical challenges. Elite strength and conditioning is a compromise between each of the 10 physical adaptations. Endurance athletes do not balance that compromise.

**Aerobics And Anaerobics**

There are three main energy systems that fuel all human activity. Almost all changes that occur in the body due to exercise are related to the demands placed on these energy systems. Furthermore, the efficacy of any given fitness regimen may largely be tied to its ability to elicit an adequate stimulus for change within these three energy systems.

Energy is derived aerobically when oxygen is utilized to metabolize substrates derived from food and liberates energy. An activity is termed aerobic when the majority of energy needed is derived aerobically. These activities are usually greater than 90 seconds in duration and involve low to moderate power output or intensity. Examples of aerobic activity include running on the treadmill for 20 minutes, swimming a mile, and watching TV.

Energy is derived anaerobically when energy is liberated from substrates in the absence of oxygen. Activities are considered anaerobic when the majority of the energy needed is derived anaerobically. In fact, properly structured, anaerobic activity can be used to develop a very high level of aerobic fitness without the muscle wasting consistent with high volume aerobic exercise! These activities are of less than two minutes in duration and involve moderate to high-power output or intensity. There are two such anaerobic systems, the phosphagen (or phosphocreatine) system and the lactic acid (or glycolytic) system. Examples of anaerobic activity include running a 100-meter sprint, squatting, and doing pull-ups.
Anaerobic and aerobic training support performance variables like strength, power, speed, and endurance. We also support the contention that total conditioning and optimal health necessitates training each of the physiological systems in a systematic fashion (see “What is Fitness?” article).

It warrants mention that in any activity all three energy systems are utilized though one may dominate. The interplay of these systems can be complex, yet a simple examination of the characteristics of aerobic vs. anaerobic training can prove useful.

CrossFit’s approach is to judiciously balance anaerobic and aerobic exercise in a manner that is consistent with the athlete’s goals. Our exercise prescriptions adhere to proper specificity, progression, variation, and recovery to optimize adaptations.

The Olympic Lifts, a.k.a., Weightlifting
There are two Olympic lifts, the clean and jerk and the snatch. Mastery of these lifts develops the squat, deadlift, power clean, and split jerk while integrating them into a single movement of unequaled value in all of strength and conditioning. The Olympic lifters are without a doubt the world’s strongest athletes.

These lifts train athletes to effectively activate more muscle fibers more rapidly than through any other modality of training. The explosiveness that results from this training is of vital necessity to every sport.

“Traditionally, calisthenic movements are high rep movements, but there are numerous body-weight exercises that only rarely can be performed for more than a rep or two. Find them. Explore them!”

-Coach Glassman

Practicing the Olympic lifts teaches one to apply force to muscle groups in proper sequence, i.e., from the center of the body to its extremities (core to extremity). Learning this vital technical lesson benefits all athletes who need to impart force to another person or object, as is commonly required in nearly all sports.
In addition to learning to impart explosive forces, the clean and jerk and snatch condition the body to receive such forces from another moving body both safely and effectively.

Numerous studies have demonstrated the Olympic lifts' unique capacity to develop strength, muscle, power, speed, coordination, vertical leap, muscular endurance, bone strength, and the physical capacity to withstand stress. It is also worth mentioning that the Olympic lifts are the only lifts shown to increase maximum oxygen uptake, the most important marker for cardiovascular fitness.

Sadly, the Olympic lifts are seldom seen in the commercial fitness community because of their inherently complex and technical nature. CrossFit makes them available to anyone with the patience and persistence to learn.

Gymnastics
The extraordinary value of gymnastics as a training modality lies in its reliance on the body's own weight as the sole source of resistance. This places a unique premium on the improvement of strength-to-weight ratio. Unlike other strength training modalities, gymnastics and calisthenics allow for increases in strength only while increasing strength-to-weight ratio!

Gymnastics develops pull-ups, squats, lunges, jumping, push-ups, and numerous presses to handstand, scales, and holds. These skills are unrivaled in their benefit to the physique as evident in any competitive gymnast.

As important as the capacity of this modality is for strength development it is without a doubt the ultimate approach to improving coordination, balance, agility, accuracy, and flexibility. Through the use of numerous presses, handstands, scales, and other floor work, the gymnast's training greatly enhances kinesthetic sense.

The variety of movements available for inclusion in this modality probably exceeds the number of exercises known to all non-gymnastic sport! The rich variety here contributes substantially to CrossFit's ability to inspire great athletic confidence and prowess.

For a combination of strength, flexibility, well-developed physique, coordination, balance, accuracy, and agility, the gymnast has no equal in the sports world. The inclusion of this training modality is absurdly absent from nearly all training programs.

Routines
There is no ideal routine! In fact, the chief value of any routine lies in abandoning it for another. The CrossFit ideal is to train for any contingency. The obvious implication is that this is possible only if there is a tremendously varied quality to the breadth of stimulus. It is in this sense that CrossFit is a core strength and conditioning program.

Anything else is sport specific training not core strength and conditioning.

Any routine, no matter how complete, contains within its omissions the parameters for which there will be no adaptation. The breadth of adaptation will exactly match the breadth of the stimulus. For this reason, CrossFit embraces short, middle, and long distance metabolic conditioning, and low, moderate, and heavy load assignment. We encourage creative and continuously varied compositions that tax physiological functions...
“The CrossFit concept can be viewed as “functional atomism” in that we strive to reduce human performance to a limited number of movements that are simple, irreducible, indivisible functions. Teaching an athlete to run, jump, throw, punch, squat, lunge, push, pull, and climb powerfully, with mechanical efficiency and soundness, across a broad range of time-intensity protocols with rapid recovery establishes a foundation that will give unprecedented advantage in learning new sports, mastering existent skills, and surviving unforeseeable challenges."

-Coach Glassman

against every realistically conceivable combination of stressors. This is the stuff of surviving fights and fires. Developing a fitness that is varied yet complete defines the very art of strength and conditioning coaching.

This is not a comforting message in an age where scientific certainty and specialization confer authority and expertise. Yet, the reality of performance enhancement cares not one wit for trend or authority. CrossFit’s success in elevating the performance of world-class athletes lies clearly in demanding of our athletes total and complete physical competence. No routine takes us there.

**Neuroendocrine Adaptation**

“Neuroendocrine adaptation” is a change in the body that affects you either neurologically or hormonally. Most important adaptations to exercise are in part or completely a result of a hormonal or neurological shift. Research, much of it done by Dr. William Kraemer at Penn State University, has shown which exercise protocols maximize neuroendocrine responses. Earlier we faulted isolation movements as being ineffectual. Now we can tell you that one of the critical elements missing from these movements is that they invoke essentially no neuroendocrine response.

Among the hormonal responses vital to athletic development are substantial increases in testosterone, insulin-like growth factor, and human growth hormone. Exercising with protocols known to elevate these hormones eerily mimics the hormonal changes sought in exogenous hormonal therapy (steroid use) with none of the deleterious effect. Exercise regimens that induce a high neuroendocrine response produce champions! Increased muscle mass and bone density are just two of many adaptive responses to exercises capable of producing a significant neuroendocrine response.

It is impossible to overstate the importance of the neuroendocrine response to exercise protocols. Heavy load weight-training, short rest between sets, high heart rates, high-intensity training, and short rest intervals, though not entirely distinct components, are all associated with a high neuroendocrine response.
Power
Power is defined as the “time rate of doing work.” It has often been said that in sport speed is king. At CrossFit “power” is the undisputed king of performance. Power is in simplest terms, “hard and fast.” Jumping, punching, throwing, and sprinting are all measures of power. Increasing your ability to produce power is necessary and nearly sufficient to elite athleticism. Additionally, power is the definition of intensity, which in turn has been linked to nearly every positive aspect of fitness. Increases in strength, performance, muscle mass, and bone density all arise in proportion to the intensity of exercise. And again, intensity is defined as power. Power development is an ever-present aspect of the CrossFit Workout of the Day (WOD).

Cross Training
Cross training is typically defined as participating in multiple sports. At CrossFit, we take a much broader view of the term. We view cross training as exceeding the normal parameters of the regular demands of your sport or training. CrossFit recognizes functional, metabolic, and modal cross training. That is, we regularly train past the normal motions, metabolic pathways, and modes or sports common to the athlete’s sport or exercise regimen. We are unique and again distinctive to the extent that we adhere to and program within this context.

If you remember CrossFit’s objective of providing a broad based fitness that provides maximal competency in all adaptive capacities, cross training, or training outside of the athlete’s normal or regular demands, is a given. Long ago, we noticed that athletes are weakest at the margins of their exposure for almost every measurable parameter. For instance, if you only cycle between five to seven miles at each training effort you will test weak at less than five and greater than seven miles. This is true for range of motion, load, rest, intensity, and power, etc. CrossFit workouts are engineered to expand the margins of exposure as broad as function and capacity will allow.

Functional Movements
There are movements that mimic motor recruitment patterns that are found in everyday life. Others are somewhat unique to the gym. Squatting is standing from a seated position; deadlifting is picking any object off the ground. They are both functional movements. Leg extension and leg curl both have no equivalent in nature and are in turn nonfunctional movements. The bulk of isolation movements are non-functional movements. By contrast the compound or multi-joint movements are functional. Natural movement typically involves the movement of multiple joints for every activity.

The importance of functional movements is primarily two-fold. First of all the functional movements are
mechanically sound and therefore safe, and secondly they are the movements that elicit a high neuroendocrine response.

CrossFit has managed a stable of elite athletes and dramatically enhanced their performance exclusively with functional movements. The superiority of training with functional movements is clearly apparent with any athlete within weeks of their incorporation.

The soundness and efficacy of functional movements are so profound that exercising without them is by comparison a colossal waste of time.

**Diet**
The CrossFit dietary prescription is as follows:

- Protein should be lean and varied and account for about 30% of your total caloric load.
- Carbohydrates should be predominantly low-glycemic and account for about 40% of your total caloric load.
- Fat should be from whole food sources and account for about 30% of your total caloric load.

Total calories should be based on protein needs, which should be set at between 0.7 and 1.0 grams of protein per pound of lean body mass (depending on your activity level). The 0.7 figure is for moderate daily workout loads and the 1.0 figure is for the hardcore athlete.

**What Should I Eat?**
In plain language, base your diet on garden vegetables, especially greens, meats, nuts and seeds, some fruit, little starch, and no sugar. That is about as simple as we can get. Many have observed that keeping your grocery cart to the perimeter of the grocery store while avoiding the aisles is a great way to protect your health. Food is perishable. The stuff with long shelf life is all circumspect. If you follow these simple guidelines you will benefit from nearly all that can be achieved through nutrition.

**The Caveman Or Paleolithic Model For Nutrition**
Modern diets are ill suited for our genetic composition. Evolution has not kept pace with advances in agriculture and food processing, resulting in a plague of health problems for modern man. Coronary heart disease, diabetes, cancer, osteoporosis, obesity, and psychological dysfunction have all been scientifically linked to a diet too high in refined or processed carbohydrate. The Caveman model is perfectly consistent with CrossFit’s prescription.

**What Foods Should I Avoid?**
Excessive consumption of high-glycemic carbohydrates is the primary culprit in nutritionally caused health problems. High-glycemic carbohydrates are those that raise blood sugar too rapidly. They include rice, bread, candy, potato, sweets, sodas, and most processed carbohydrates. Processing can include bleaching, baking, grinding, and refining. Processing of carbohydrates greatly increases their Glycemic Index, a measure of their propensity to elevate blood sugar.

**What Is The Problem With High-Glycemic Carbohydrates?**
The problem with high-glycemic carbohydrates is that in excess they give an inordinate insulin response. Insulin is an essential hormone for life, yet acute, chronic elevation of insulin leads to hyperinsulinism, which has been positively linked to obesity, elevated cholesterol levels, blood pressure, mood dysfunction, and a Pandora’s box of disease and disability. Research “hyperinsulinism.” CrossFit’s prescription is a low-glycemic diet (and lower in total carbohydrate quantity) and consequently severely blunts the insulin response, yet still provides ample nutrition for rigorous activity.
What is Fitness? (Part 1)

Originally published in October 2002, this article explains the supporting models and concepts for defining fitness. Part 2, which follows, contains the definitions of fitness and health.

What Is Fitness And Who Is Fit?
In 1997, Outside Magazine crowned triathlete Mark Allen “the fittest man on Earth.” Let us just assume for a moment that this famous six-time winner of the IronMan Triathlon is the fittest of the fit, then what title do we bestow on the decathlete Simon Poelman, who also possesses incredible endurance and stamina, yet crushes Mr. Allen in any comparison that includes strength, power, speed, and coordination?

Perhaps the definition of fitness does not include strength, speed, power, and coordination, though that seems rather odd. Merriam Webster’s Collegiate Dictionary defines “fitness” and being “fit” as the ability to transmit genes and being healthy. No help there. Searching the Internet for a workable, reasonable definition of fitness yields disappointingly little. Worse yet, the National Strength & Conditioning Association (NSCA), the most respected publisher in exercise physiology, in its highly authoritative Essentials of Strength Training and Conditioning, does not even attempt a definition.

CrossFit’s Fitness
For CrossFit, the specter of championing a fitness program without clearly defining what it is that the program delivers combines elements of fraud and farce. The vacuum of guiding authority has therefore necessitated that CrossFit provides their own definition of fitness. That is what this article is about, our “fitness.”

Our pondering, studying, debating about, and finally defining fitness have played a formative role in CrossFit’s successes. The keys to understanding the methods and achievements of CrossFit are perfectly embedded in our view of fitness and basic exercise science.

CrossFit makes use of four different models for evaluating and guiding fitness. Collectively, these four models provide the basis for CrossFit’s definition of fitness. The first is based on the 10 general physical skills widely recognized by exercise physiologists; the second model is based on the performance of athletic tasks; the third is based on the energy systems that drive all human action; the fourth uses health markers as a measure of fitness.

Figure 1. World Class Fitness in 100 Words.

- 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.
- Practice and train major lifts: Deadlift, clean, squat, presses, C&J (clean and jerk), and snatch. Similarly, master the basics of gymnastics: pull-ups, dips, rope climb, push-ups, sit-ups, presses to handstand, pirouettes, flips, splits, and holds. Bike, run, swim, row, etc., hard and fast.
- Five or six days per week mix these elements in as many combinations and patterns as creativity will allow. Routine is the enemy. Keep workouts short and intense.
- Regularly learn and play new sports.
Each model is critical to CrossFit and each has distinct utility in evaluating an athlete's overall fitness or a strength and conditioning regimen's efficacy. Before explaining in detail how each of these four models works, it warrants mention that we are not attempting to demonstrate our program's legitimacy through scientific principles. We are but sharing the methods of a program whose legitimacy has been established through the testimony of athletes, soldiers, cops, and others whose lives or livelihoods depend on fitness.

CrossFit’s First Fitness Model: The 10 General Physical Skills

There are 10 recognized general physical skills. They are cardiovascular/respiratory endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance, and accuracy. (See Figure 2. Ten General Physical Skills for definitions.) You are as fit as you are competent in each of these 10 skills. A regimen develops fitness to the extent that it improves each of these 10 skills.

Importantly, improvements in endurance, stamina, strength, and flexibility come about through training. Training refers to activity that improves performance through a measurable organic change in the body. By contrast improvements in coordination, agility, balance, and accuracy come about through practice. Practice refers to activity that improves performance through changes in the nervous system. Power and speed are adaptations of both training and practice.

CrossFit’s Second Fitness Model: The Hopper

The essence of this model is the view that fitness is about performing well at any and every task imaginable. Picture

“Our emphasis on skill development is integral to our charter of optimizing work capacity.”

-Coach Glassman

If your goal is optimum physical competence then all the general physical skills must be considered:

1. Cardiovascular/respiratory endurance—The ability of body systems to gather, process, and deliver oxygen.

2. Stamina—The ability of body systems to process, deliver, store, and utilize energy.

3. Strength—The ability of a muscular unit, or combination of muscular units, to apply force.

4. Flexibility—The ability to maximize the range of motion at a given joint.

5. Power—The ability of a muscular unit, or combination of muscular units, to apply maximum force in minimum time.

6. Speed—The ability to minimize the time cycle of a repeated movement.

7. Coordination—The ability to combine several distinct movement patterns into a singular distinct movement.

8. Agility—The ability to minimize transition time from one movement pattern to another.

9. Balance—The ability to control the placement of the body’s center of gravity in relation to its support base.

10. Accuracy—The ability to control movement in a given direction or at a given intensity.

(Ed.–Thanks to Jim Crawley and Bruce Evans of Dynamax)
a hopper loaded with an infinite number of physical challenges, where no selective mechanism is operative, and being asked to perform feats randomly drawn from the hopper. This model suggests that your fitness can be measured by your capacity to perform well at these tasks in relation to other individuals.

The implication here is that fitness requires an ability to perform well at all tasks, even unfamiliar tasks, tasks combined in infinitely varying combinations. In practice this encourages the athlete to disinvest in any set notions of sets, rest periods, reps, exercises, order of exercises, routines, periodization, etc. Nature frequently provides largely unforeseeable challenges; train for that by striving to keep the training stimulus broad and constantly varied.

**CrossFit’s Third Fitness Model: The Metabolic Pathways**

There are three metabolic pathways that provide the energy for all human action. These “metabolic engines”

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**Table 1. Summary of the Three Metabolic Pathways**

<table>
<thead>
<tr>
<th></th>
<th>Phosphocreatine</th>
<th>Glycolytic</th>
<th>Oxidative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Domain</strong></td>
<td>Short, ~10 seconds</td>
<td>Medium, ~120 seconds</td>
<td>Long, &gt;120 seconds</td>
</tr>
<tr>
<td><strong>Anaerobic vs. Aerobic</strong></td>
<td>Anaerobic</td>
<td>Anaerobic</td>
<td>Aerobic</td>
</tr>
<tr>
<td><strong>Relative Power Output</strong></td>
<td>Maximum-intensity efforts (~100 percent)</td>
<td>Medium-high-intensity efforts (70 percent)</td>
<td>Low-intensity efforts (40 percent)</td>
</tr>
<tr>
<td><strong>Other Names</strong></td>
<td>Phosphagen</td>
<td>Lactate</td>
<td>Aerobic</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Cytosol of muscle cells (i.e., sarcoplasm)</td>
<td>Cytosol of all cells</td>
<td>Mitochondria of cells</td>
</tr>
<tr>
<td><strong>Muscle Fiber Type (General)</strong></td>
<td>Type IIb</td>
<td>Type IIA</td>
<td>Type I</td>
</tr>
<tr>
<td><strong>Substrate</strong></td>
<td>Phosphocreatine molecules in muscles</td>
<td>Glucose from bloodstream, muscle (glycogen), or glycerol (derived from fat)</td>
<td>Pyruvate (from glycolysis), or acetate (derived from fat or protein)</td>
</tr>
<tr>
<td><strong>ATP Mechanism</strong></td>
<td>Phosphate molecule from phosphocreatine joins ADP to form ATP</td>
<td>Glucose oxidized to pyruvate produces 2 ATP</td>
<td>Pyruvate oxidized to produce 34 ATP (fat, protein yield less)</td>
</tr>
<tr>
<td><strong>Example Activities</strong></td>
<td>100 meter dash, 1-repetition maximum deadlift</td>
<td>400 meter sprint, Elite level Fran</td>
<td>Anything &gt;120 seconds of sustained effort</td>
</tr>
</tbody>
</table>
are known as the phosphagen (or phosphocreatine) pathway, the glycolytic (or lactate) pathway, and the oxidative (or aerobic) pathway (Figure 3, Table 1). The first, the phosphagen, dominates the highest-powered activities, those that last less than about 10 seconds. The second pathway, the glycolytic, dominates moderate-powered activities, those that last up to several minutes. The third pathway, the oxidative, dominates low-powered activities, those that last in excess of several minutes.

Total fitness, the fitness that CrossFit promotes and develops, requires competency and training in each of these three pathways or engines. Balancing the effects of these three pathways largely determines the how and why of the metabolic conditioning or "cardio" that we do at CrossFit.

Favoring one or two to the exclusion of the others and not recognizing the impact of excessive training in the oxidative pathway are arguably the two most common faults in fitness training. More on that later.

CrossFit’s Fourth Fitness Model: Sickness-Wellness-Fitness Continuum

There is another aspect to the CrossFit’s fitness that is of great interest and immense value to us. We have observed that nearly every measurable value of health can be placed on a continuum that ranges from sickness to wellness to fitness (Figure 4). Though tougher to measure, we would even add mental health to this observation. Depression is clearly mitigated by proper diet and exercise; to genuine fitness.

For example, a blood pressure of 160/95 is pathological, 120/70 is normal or healthy, and 105/55 is consistent with an athlete’s blood pressure; a body fat of 40% is pathological, 20% is normal or healthy, and 10% is fit. We observe a similar ordering for bone density, triglycerides, muscle mass, flexibility, HDL or “good cholesterol,” resting heart rate, and dozens of other common measures of health (Table 2). Many authorities (e.g. Mel Siff, the NSCA) make a clear distinction between health and fitness. Frequently they cite studies that suggest that the fit may not be health protected. A close look at the supporting evidence invariably reveals the studied group is endurance athletes

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Our assumption is that if everything we can measure about health will conform to this continuum then it seems that sickness, wellness, and fitness are different measures of a single quality: health.

Figure 4. The Sickness-Wellness-Fitness Continuum.
and, we suspect, endurance athletes on a dangerous fad diet (high-carbohydrate, low-fat, low-protein).

Done right, fitness provides a great margin of protection against the ravages of time and disease. Where you find otherwise, examine the fitness protocol, especially diet. Fitness is and should be “super-wellness.” Sickness, wellness, and fitness are measures of the same entity. A fitness regimen that does not support health is not CrossFit.

Common Ground
The motivation for the four models is simply to ensure the broadest and most general fitness possible. Our first model evaluates our efforts against a full range of general physical adaptations, in the second the focus is on breadth and depth of performance, with the third the measure is time, power and consequently energy systems, and the four is on health markers. It should be fairly clear that the fitness that CrossFit advocates and develops is deliberately broad, general, and inclusive. Our specialty is not specializing. Combat, survival, many sports, and life reward this kind of fitness and, on average, punish the specialist.

Implementation
Our fitness, being “CrossFit,” comes through molding men and women that are equal parts gymnast, Olympic weightlifter, and multi-modal sprinter or “sprintathlete.” Develop the capacity of a novice 800-meter track athlete, gymnast, and weightlifter and you will be fitter than any world-class runner, gymnast, or weightlifter. Let us look at how CrossFit incorporates metabolic conditioning (“cardio”), gymnastics, and weightlifting to forge the world’s fittest men and women.

**Metabolic Conditioning, Or “Cardio”**
Biking, running, swimming, rowing, speed skating, and cross-country skiing are collectively known as “metabolic conditioning.” In the common vernacular they are referred to as “cardio.” CrossFit’s third fitness model, the one that deals with metabolic pathways, contains the seeds of the CrossFit “cardio” prescription. To understand the CrossFit approach to “cardio” we need first to briefly cover the nature and interaction of the three major pathways.

Of the three metabolic pathways the first two, the phosphagen and the glycolytic, are “anaerobic” and the third, the oxidative, is “aerobic.” We need not belabor the biochemical significance of aerobic and anaerobic systems; suffice it to say that the nature and interaction of anaerobic exercise and aerobic exercise is vital to understanding conditioning. Just remember that efforts at moderate to high-power and lasting less than several minutes are anaerobic and efforts at low-power and

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sickness</th>
<th>Wellness</th>
<th>Fitness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Fat (percent)</td>
<td>&gt;25 (men)</td>
<td>~18 (male)</td>
<td>~6 (male)</td>
</tr>
<tr>
<td></td>
<td>&gt;32 (women)</td>
<td>~20 (female)</td>
<td>~12 (female)</td>
</tr>
<tr>
<td>Blood Pressure (mm/Hg)</td>
<td>&gt;140/90</td>
<td>120/80</td>
<td>105/60</td>
</tr>
<tr>
<td>Resting Heart Rate (bpm)</td>
<td>&gt;100</td>
<td>70</td>
<td>50</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>&gt;200 mg/dl</td>
<td>&lt;150 mg/dl</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Low-density Lipoprotein (mg/dl)</td>
<td>&gt;160</td>
<td>120</td>
<td>&lt;100</td>
</tr>
<tr>
<td>High-density Lipoprotein (mg/dl)</td>
<td>&lt;40</td>
<td>40-59</td>
<td>&gt;60</td>
</tr>
<tr>
<td>C-Reactive Protein (high-sensitivity test, mg/L)</td>
<td>&gt;3</td>
<td>1-3</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>
lasting in excess of several minutes are aerobic. As an example the sprints at 100, 200, 400, and 800 meters are largely anaerobic and events like 1,500 meters, the mile, 2,000 meters, and 3,000 meters are largely aerobic.

Aerobic training benefits cardiovascular function and decreases body fat—all good. Aerobic conditioning allows us to engage in low-power extended efforts efficiently (cardio/respiratory endurance and stamina). This is critical to many sports. Athletes engaged in sports or training where a preponderance of the training load is spent in aerobic activity witness decreases in muscle mass, strength, speed, and power. It is not uncommon to find marathoners with a vertical leap of only several inches! Furthermore, aerobic activity has a pronounced tendency to decrease anaerobic capacity. This does not bode well for most athletes or those interested in elite fitness.

Anaerobic activity also benefits cardiovascular function and decreases body fat! In fact, anaerobic exercise is superior to aerobic exercise for fat loss! Anaerobic activity is, however, unique in its capacity to dramatically improve power, speed, strength, and muscle mass. Anaerobic conditioning allows us to exert tremendous forces over brief time intervals. One aspect of anaerobic conditioning that bears great consideration is that anaerobic conditioning will not adversely affect aerobic capacity. In fact, 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! The method by which we use anaerobic efforts to develop aerobic conditioning is “interval training.”

Basketball, football, gymnastics, boxing, track events under one mile, soccer, swimming events under 400 meters, volleyball, wrestling, and weightlifting are all sports that require the vast majority of training time spent in anaerobic activity. Long distance and ultra endurance running, cross-country skiing, and 1,500+ meter swimming are all sports that require aerobic training at levels that produce results unacceptable to other athletes or the individual concerned with total conditioning and optimal health.

We strongly recommend that you attend a track meet of nationally or internationally competitive athletes. Pay close attention to the physiques of the athletes competing at 100, 200, 400, 800 meters, and the milers. The difference you are sure to notice is a direct result of training at those distances.

**Interval Training**
The key to developing the cardiovascular system without an unacceptable loss of strength, speed, and power is

> “Blur the distinction between strength training and metabolic conditioning for the simple reason that nature’s challenges are typically blind to the distinction.”

* -Coach Glassman
interval training. Interval training mixes bouts of work and rest in timed intervals. Table 3 gives guidelines for interval training. We can control the dominant metabolic pathway conditioned by varying the duration of the work and rest interval and number of repetitions. Note that the phosphagen pathway is the dominant pathway in intervals of 10–30 seconds of work followed by rest of 30–90 seconds (load:recovery 1:3) repeated 25–30 times. The glycolytic pathway is the dominant pathway in intervals of 30–120 seconds work followed by rest of 60–240 seconds (load:recovery 1:2) repeated 10–20 times. And finally, the oxidative pathway is the dominant pathway in intervals of 120–300 seconds work followed by rest of 120–300 seconds (load:recovery 1:1). The bulk of metabolic training should be interval training.

Interval training need not be so structured or formal. One example would be to sprint between one set of telephone poles and jog between the next set alternating in this manner for the duration of a run.

One example of an interval that CrossFit makes regular use of is the Tabata Interval, which is 20 seconds of work followed by 10 seconds of rest repeated eight times. Dr. Izumi Tabata published research that demonstrated that this interval protocol produced remarkable increases in both anaerobic and aerobic capacity.

It is highly desirable to regularly experiment with interval patterns of varying combinations of rest, work, and repetitions.

One of the best resources on interval training comes from Dr. Stephen Seiler with articles on interval training and another on the time course of training adaptations that contain the seeds of CrossFit’s heavy reliance on interval training. The article on the time course of training adaptations explains that there are three waves of adaptation to endurance training. The first wave is increased maximal oxygen consumption. The second is increased lactate threshold. The third is increased efficiency. In the CrossFit concept, we are interested in maximizing first wave adaptations and procuring the second systemically through multiple modalities, including weight-training, and avoiding completely third wave adaptations. Second and third wave adaptations are highly specific to the activity in which they are developed and can be detrimental with too much focus to the broad fitness that we advocate and develop. A clear understanding of this material has prompted us to advocate regular high-intensity training in as many training modalities as possible through largely anaerobic efforts and intervals while deliberately and specifically avoiding the efficiency that accompanies mastery of a single modality. It is at first ironic that our interpretation of Dr. Seiler’s work was not his intention, but when our quest of optimal physical competence is viewed in light of Dr. Seiler’s more specific aim of maximizing endurance performance, our interpretation is powerful.

Dr. Seiler’s work, incidentally, makes clear the fallacy of assuming that endurance work is of greater benefit to the cardiovascular system than higher intensity interval work. This is very important: with interval training we get all of the cardiovascular benefit of endurance work without the attendant loss of strength, speed, and power.

Gymnastics
Our use of the term “gymnastics” not only includes the traditional competitive sport that we have seen on TV, but all activities like climbing, yoga, calisthenics, and dance where the aim is body control. It is within this realm of activities that we can develop extraordinary

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Table 3. Representative Guidelines for Interval Training

<table>
<thead>
<tr>
<th>Primary Energy System</th>
<th>Sprint</th>
<th>Mid-Distance</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphagen</td>
<td>10–30</td>
<td>30–120</td>
<td>120–300</td>
</tr>
<tr>
<td>Glycolytic</td>
<td>30–90</td>
<td>60–240</td>
<td>120–300</td>
</tr>
<tr>
<td>Oxidative</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration of work (in seconds)</th>
<th>1:3</th>
<th>1:2</th>
<th>1:1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of recovery (in seconds)</td>
<td>25–30</td>
<td>10–20</td>
<td>3–5</td>
</tr>
</tbody>
</table>

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Gymnastics
Our use of the term “gymnastics” not only includes the traditional competitive sport that we have seen on TV, but all activities like climbing, yoga, calisthenics, and dance where the aim is body control. It is within this realm of activities that we can develop extraordinary
strength (especially upper body and trunk), flexibility, coordination, balance, agility, and accuracy. In fact, the traditional gymnast has no peer in terms of development of these skills.

CrossFit uses short parallel bars, mats, still rings, pull-up and dip bars, and a climbing rope to implement our gymnastics training.

The starting place for gymnastic competency lies with the well-known calisthenic movements: pull-ups, push-ups, dips, and rope climbs. These movements need to form the core of your upper body strength work. Set goals for achieving benchmarks like 20, 25, and 30 pull-ups; 50, 75, and 100 push-ups; 20, 30, 40, and 50 dips; 1, 2, 3, 4, and 5 consecutive trips up the rope without any use of the feet or legs.

At 15 pull-ups and dips each, it is time to start working regularly on a “muscle-up.” The muscle-up is moving from a hanging position below the rings to a supported position, arms extended, above the rings. It is a combination movement containing both a pull-up and a dip. Far from a contrivance, the muscle-up is hugely functional. With a muscle-up, you will be able to surmount any object on which you can get a finger hold—if you can touch it, you can get up on it. The value here for survival, police, fire fighter, and military use is impossible to overstate. The key to developing the muscle-up is pull-ups and dips.

While developing your upper body strength with the pull-ups, push-ups, dips, and rope climbs, a large measure of balance and accuracy can be developed through mastering the handstand. Start with a headstand against the wall if you need to. Once reasonably comfortable with the inverted position of the headstand, you can practice kicking up to the handstand again against a wall. Later take the handstand to the short parallel bars or parallettes without the benefit of the wall. After you can hold a handstand for several minutes without benefit of the wall or a spotter it is time to develop a pirouette. A pirouette is lifting one arm and turning on the supporting arm 90 degrees to regain the handstand then repeating this with alternate arms until you have turned 180 degrees. This skill needs to be practiced until it can be done with little chance of falling from the handstand. Work in intervals of 90 degrees as benchmarks of your growth–90, 180, 270, 360, 450, 540, 630, and finally 720 degrees.

Walking on the hands is another fantastic tool for developing both the handstand and balance and accuracy. A football field or sidewalk is an excellent place to practice and measure your progress. You want to be able to walk 100 yards in the handstand without falling.

Competency in the handstand readies the athlete for handstand presses. There is a family of presses that range from relatively easy ones that any beginning gymnast can perform, to ones so difficult that only the best gymnasts competing at national levels can perform. Their hierarchy of difficulty is bent arm/bent body (hip)/bent leg; straight arm/bent body/bent leg; straight arm/bent body/straight leg; bent arm/straight body/straight leg, and finally the monster: straight arm/straight body/straight leg. It is not unusual to take 10 years to get these five presses!

The trunk flexion work in gymnastics is beyond anything you will see
anywhere else. Even the beginning gymnastic trunk movements cripple bodybuilders, weightlifters, and martial artists. The basic sit-up and “L” hold are the staples. The “L” hold is nothing more than holding your trunk straight, supported by locked arms, hands on bench, floor, or parallel bars, and hips at 90 degrees with legs straight held out in front of you. You want to work towards a three minute hold in benchmark increments of 30 seconds—30, 60, 90, 120, 150, and 180 seconds. When you can hold an “L” for three minutes, all your old ab work will be silly easy.

We recommend Bob Anderson’s Stretching. This is a simple, no nonsense approach to flexibility. The science of stretching is weakly developed and many athletes like gymnasts who demonstrate great flexibility receive no formal instruction. Just do it. Generally, you want to stretch in a warm-up to establish safe, effective range of motion for the ensuing activity and stretch during cool down to improve flexibility.

There is a lot of material to work with here. We highly recommend an adult gymnastics program if there is one in your area. Our friends at www.drillsandskills.com have enough material to keep you busy for years. This is among our favorite fitness sites.

Every workout should contain regular gymnastic/calisthenic movements that you have mastered and other elements under development. Much of the rudiments of gymnastics come only with great effort and frustration—that is acceptable. The return is unprecedented and the most frustrating elements are most beneficial—long before you have developed even a modicum of competency.

Weightlifting

“Weightlifting” as opposed to “weight lifting” or “weight-training,” refers to the Olympic sport, which includes the “clean and jerk” and the “snatch.” Weightlifting, as it is often referred to, develops strength (especially in the hips), speed, and power like no other training modality. It is little known that successful weightlifting requires substantial flexibility. Olympic weightlifters are as flexible as any athletes.

The benefits of weightlifting do not end with strength, speed, power, and flexibility. The clean and jerk and the snatch both develop coordination, agility, accuracy, and balance and to no small degree. Both of these lifts are as nuanced and challenging as any movement in all of sport. Moderate competency in the Olympic lifts confers added

“The benefits of weightlifting do not end with strength, speed, power, and flexibility. The clean and jerk and the snatch both develop coordination, agility, accuracy, and balance and to no small degree. Both of these lifts are as nuanced and challenging as any movement in all of sport. Moderate competency in the Olympic lifts confers added

“If strength at high heart rates is fundamental to your sport then you’d best perform your resistance training at high heart rate.”

- Coach Glassman

prowess to any sport.

The Olympic lifts are based on the deadlift, clean, squat, and jerk. These movements are the starting point for any serious weight-training program. In fact they should serve as the core of your resistance training throughout your life.

Why the deadlift, clean, squat, and jerk? Because these movements elicit a profound neuroendocrine response. That is, they alter you hormonally and neurologically. The changes that occur through these movements are essential to athletic development. Most of the development that occurs as a result of exercise is systemic and a direct result of hormonal and neurological changes.

Curls, lateral raises, leg extensions, leg curls, flyes, and other bodybuilding movements have no place in a serious strength and conditioning program primarily because they have a blunted neuroendocrine response. A distinctive feature of these relatively worthless movements is that they have no functional analog in everyday life and they work only one joint at a time. Compare this to the deadlift, clean, squat, and jerk which are functional and multi-joint movements.

Start your weightlifting career with the deadlift, clean, squat, and jerk then introduce the “clean and jerk” and
Nutrition
Nutrition plays a critical role in your fitness. Proper nutrition can amplify or diminish the effect of your training efforts. Effective nutrition is moderate in protein, carbohydrate, and fat. Forget about the fad high-carbohydrate, low-fat, and low-protein diet. Balanced macronutrient and healthy nutrition looks more like 40% carbohydrate, 30% protein, and 30% fat. Dr. Barry Sears’ Zone Diet still offers the greatest precision, efficacy, and health benefit of any clearly defined protocol. The Zone Diet does an adequate job of jointly managing issues of blood glucose control, proper macronutrient proportion, and caloric restriction whether your concern is athletic performance, disease prevention and longevity, or body composition. We recommend that every one read Dr. Sears book “Enter the Zone” (see also “Nutrition” section).

Sport
Sport plays a wonderful role in fitness. Sport is the application of fitness in a fantastic atmosphere of competition and mastery. Training efforts typically include relatively predictable repetitive movements and provide limited opportunity for the essential combination of our 10 general physical skills. It is, after all, the combined expression, or application, of the 10 general skills that is our motivation for their development in the first place. Sports and games like soccer, martial arts, baseball, and basketball in contrast to our training workouts have more varied and

“There is no single sport or activity that trains for perfect fitness. True fitness requires a compromise in adaptation broader than the demands of most every sport.”

-Coach Glassman

snatch. Much of the best weight-training material on the Internet is found on “power lifting” sites. Powerlifting is the sport of three lifts: the bench press, squat, and deadlift. Powerlifting is a superb start to a lifting program followed later by the more dynamic clean and the jerk and finally the “clean & jerk” and the “snatch.”

The movements that we are recommending are very demanding and very athletic. As a result they have kept athletes interested and intrigued where the typical fare offered in most gyms (bodybuilding movements) typically bores athletes to distraction. Weightlifting is sport; weight-training is not.

Throwing
Our program includes not only weightlifting and powerlifting, but also throwing work with medicine balls. The medicine ball work we favor provides both physical training and general movement practice. We are huge fans of the Dynamax medicine ball and associated throwing exercises. The medicine ball drills add another potent stimulus for strength, power, speed, coordination, agility, balance, and accuracy.

There is a medicine ball game known as Hoover Ball. It is played with an eight-foot volleyball net and scored like tennis. This game burns three times more calories than tennis and is great fun. The history and rules of Hoover Ball are available from the Internet.
less predictable movements. But, where sports develop and require all 10 general skills simultaneously, they do so slowly compared to our strength and conditioning regimen. Sport is better, in our view, at expression and testing of skills than it is at developing these same skills. Both expression and development are crucial to our fitness. Sport in many respects more closely mimics the demands of nature than does our training. We encourage and expect our athletes to engage in regular sports efforts in addition to all of their strength and conditioning work.

**A Theoretical Hierarchy Of Development**

A theoretical hierarchy exists for the development of an athlete (Figure 5). It starts with nutrition and moves to metabolic conditioning, gymnastics, weightlifting, and finally sport. This hierarchy largely reflects foundational dependence, skill, and to some degree, time ordering of development. The logical flow is from molecular foundations, cardiovascular sufficiency, body control, external object control, and ultimately mastery and application. This model has greatest utility in analyzing athletes’ shortcomings or difficulties.

We do not deliberately order these components but nature will. If you have a deficiency at any level of “the pyramid” the components above will suffer.

**Integration**

Every regimen, every routine contains within its structure a blueprint for its deficiency. If you only work your weight-training at low-reps you will not develop the localized muscular endurance that you might have otherwise. If you work high-reps exclusively you will not build the same strength or power that you would have at low-reps. There are advantages and disadvantages to working out slowly or quickly, with high weights or low weights, completing “cardio” before or after, etc.

For the fitness that we are pursuing, every parameter within your control needs to be modulated to broaden the stimulus as much as possible. Your body will only respond to an unaccustomed stressor; routine is the enemy of progress and broad adaptation. Do not subscribe to high-reps, or low-reps, or long rests, or short rests, but strive for variance.

So then, what are we to do? Work on becoming a better weightlifter, stronger-better gymnast, and faster rower, runner, swimmer, cyclist is the answer. There are an infinite number of regimens that will deliver the goods.

Generally, we have found that three days on and one day off allows for a maximum sustainability at maximum intensities. One of our favorite workout patterns is to warm up and then perform three to five sets of three to five reps of a fundamental lift at a moderately comfortable pace followed by a 10 minute circuit of gymnastics elements at a blistering pace and finally finish with two to 10 minutes of high-intensity metabolic conditioning. There is nothing sacred in this pattern. The magic is in the movements not the routine. Be creative.

Another favorite is to blend elements of gymnastics and weightlifting in couplets that combine to a dramatic metabolic challenge. An example would be to perform five reps of a moderately heavy back squat followed immediately by a set of max reps pull-ups repeated three to five times.

On other occasions we will take five or six elements balanced between weightlifting, metabolic conditioning, and gymnastics and combine them in a single circuit that we blow through three times without a break.

We can create routines like this forever. In fact our CrossFit.com archives contain thousands of daily workouts consciously mixed and varied in this manner. Perusing

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**Figure 5. The Theoretical Hierarchy of the Development of an Athlete.**
them will give you an idea of how we mix and modulate our key elements.

We have not mentioned here our penchant for jumping, kettlebells, odd object lifting, and obstacle course work. The recurring theme of functionality and variety clearly suggest the need and validity for their inclusion though.

Finally, strive to blur distinctions between "cardio" and strength training. Nature has no regard for this distinction or any other, including our 10 physical adaptations. We will use weights and plyometrics training to elicit a metabolic response and sprinting to improve strength.

**Scalability And Applicability**
The question regularly arises as to the applicability of a regimen like CrossFit’s to older and deconditioned or untrained populations. The needs of an Olympic athlete and our grandparents differ by degree not kind. One is looking for functional dominance, the other for functional competence. Competence and dominance manifest through identical physiological mechanisms.

We have used our same routines for elderly individuals with heart disease and cage fighters one month out from televised bouts. We scale load and intensity; we do not change programs.

We get requests from athletes from every sport looking for a strength and conditioning program for their sport. Firemen, soccer players, triathletes, boxers, and surfers all want programs that conform to the specificity of their needs. While admitting that there are surely needs specific to any sport, the bulk of sport specific training has been ridiculously ineffective. The need for specificity is nearly completely met by regular practice and training within the sport not in the strength and conditioning environment. Our terrorist hunters, skiers, mountain bikers and housewives have found their best fitness from the same regimen.
“Valid criticisms of a fitness program need to speak to measurable, observable, repeatable data. If an alternative to CrossFit is worthy of our consideration it ought to be presented in terms of distance, time, load, velocity, work and power related to movements, skills, and drills. Give me performance data. CrossFit can be scientifically and logically evaluated only on these terms.”

-Coach Glassman
In this two part lecture, Coach Glassman defines fitness and health. This lecture is the first time CrossFit published a definition for health. It is as a three-dimensional model that measures fitness across age and has the potential to both redefine and unite the health and fitness fields forever.

Science is about measurement and prediction. Without measurable, observable, repeatable data concerning the fundamental physical units of kinematics (mass, distance, and time), there is no science of human performance. But physical output can be measured (e.g., foot-pounds/minute): we move our own bodies and external objects, we can measure how heavy those bodies and objects are, how far they travel, and how long it takes.

Power (average) = Force x Distance / Time.

Your ability to move large loads, long distances, quickly, in the broadest variety of domains is fitness. Fitness is defined as work capacity across broad time and modal domains, and health is defined as work capacity across broad time and modal domains throughout life. It is fitness across one's age.

CrossFit’s prescription for achieving this fitness is constantly varied high-intensity functional movements. We can accurately predict improvements in work capacity across broad time, modal, and age domains through this prescription. We have tens of thousands of examples at this point.

In Video 1, Coach covers the first three models of fitness originally published in the 2002 “What is Fitness?” article, and how they support CrossFit’s definition of fitness (Figure 1).

**Video 1 (20 min)**


In Video 2, Coach Glassman explains the fourth model, the Sickness-Wellness-Fitness Continuum, and how that becomes subordinate to the metric of maximizing the volume of work capacity across broad time and modal domains throughout your life.
The new component introduced in this lecture is age. Fitness can be graphed in two-dimensions with duration of effort (time) on the x-axis and power on the y-axis. At each duration, we average your power output across a variety of modal domains (skills and drills). This creates a power curve, the area under which is your work capacity across broad time and modal domains (your "fitness").

We can now add a third dimension to this graph, the z-axis, which is age. By reassessing your two-dimensional fitness at various times throughout your life, we graph the form of a solid. The power curve takes on the shape of a plateau or blanket (Figure 2). This three-dimensional graph is a defining measure of health. Health, therefore, is nothing other than sustained fitness.

Video 2 (18 min)

Figure 2. A Graphical Representation of One’s Health (Fitness Throughout His or Her Life).
Learn the mechanics of fundamental movements; establish a consistent pattern of practicing these same movements, and, only then, ratchet up the intensity of workouts incorporating these movements. ‘Mechanics,’ then ‘Consistency,’ and then ‘Intensity’—this is the key to effective implementation of CrossFit programming.”

-Coach Glassman

This quantification of fitness is a part of a broader concept that is at the heart of this movement: We call it evidence-based fitness. This means measurable, observable, repeatable data is used in analyzing and assessing a fitness program. There are three meaningful components to analyze a fitness program: safety, efficacy and efficiency.

The efficacy of a program means, “What is the return?” Maybe a fitness program advertises that it will make you a better soccer player. There needs to be evidence of this supported by measurable, observable, repeatable data. For CrossFit, we want to increase your work capacity across broad time and modal domains. This is the efficacy of this program. What are the tangible results? What is the adaptation that the program induces?

Efficiency is the time rate of that adaptation. Maybe the fitness program advertises that it can deliver 50 pull-ups. There is a big difference whether it takes six months versus nine years to achieve that.

Safety is how many people end up at the finish line. Suppose I have a fitness program. I start with 10 individuals: Two of them become the fittest human beings on Earth and the other eight die. While I would rather be one of the two fittest than the eight dead, and I do not know if I want to play, I am not going to attach a normative value to it. The real tragedy comes in not knowing the safety numbers.

These three vectors of safety, efficacy and efficiency point in the same direction, such that they are not entirely at odds with each other. I can greatly increase the safety of a program by turning the efficacy and efficiency down to zero. I can increase the efficiency by turning up the intensity and then possibly compromise safety. Or I could damage the efficacy by losing people. Safety, efficacy and efficiency are the three meaningful aspects of a program. They give me all I need to assess it.
This quantification of fitness, by choosing work capacity as our standard for the efficacy of the program, necessitates the qualification of movement. Our quantification of fitness movement introduces qualification of movement.

For the qualification of movement there are four common terms: mechanics, technique, form and style. I will not delve into them with too much detail; the distinction is not that important. I use both technique and form somewhat interchangeably, although there is a slightly nuanced distinction.

When I talk about angular velocity, momentum, leverage, origin or insertion of muscles, torque, force, power, relative angles, we are taking about mechanics. When I speak to the physics of movement, and especially the statics and less so the dynamics, I am looking at the mechanics.

Technique is the method to success for completion of a movement. For example, if you want to do a full twisting dismount on the rings, the technique would be: pull, let go, look, arm up, turn, shoulder drop, etc. Technique includes head posture and body posture. And there are effective and less effective techniques. Technique includes the mechanics, but it is in the macro sense of “how do you complete the movement without the physics?”

Form is the normative value: This is good or this is bad—“you should” or “you shouldn't” applied to mechanics and technique.

Style is essentially the signature to a movement; that is, that aspect of the movement that is fairly unique to you. The best of the weightlifting coaches can look at the bar path during a lift and tell you which lifter it is. There are aspects to all of our movements that define us like your thumbprint. It is the signature. To be truly just the signature, style elements have no bearing on form, technique or mechanics. Style does not enter into the normative assessment, is not important to technique and does not alter substantially the physics.

These four terms are all qualifications to movement. I want to speak generally to technique and form to include all of this, but what we are talking about here is the non-quantification of output; that is, how you move.

By taking power or work capacity as our primary value for assessing technique—and this reliance on functional movement—and we end up in kind of an interesting position. We end up where power is the successful completion of functional movement.

This is not about merely energy exerted. On a graph, you could put work completed on the X-axis and energy expended on the Y-axis. Someone could potentially expend a lot of energy and do very little work by being inefficient. Ideally, what that individual would do would see little energy expended. for the maximum amount of work. Technique is what maximizes the work completed for the energy expended (Figure 1). For any given capacity, say metabolically, for energy expenditure, the guy who knows the technique is going to be able to do the most amount of work.

Suppose I take two people at random and they are both trying the same task. One is familiar with how to deadlift, and one is not. One knows how to clean, one does not. One knows how to drive overhead, one does not. Suppose they are loading a truck with sandbags. The one familiar
with lifting large objects and transporting them is going to do a lot more work.

You can have the argument as to who is stronger. For example, you can use an electromyogram and see with what force the biceps shortens. If you are defining strength as contractile potential, you may end up with the guy with enormous contractile potential—but not knowing the technique of the clean, the jerk, the deadlift, he cannot do as much work.

We, however, do not take contractile potential as the gold standard for strength. Strength is the productive application of force. If you cannot complete work, if you cannot express strength as power, if strength cannot be expressed as productive result, it does not count. Having enormous biceps and quadriceps is useless if you cannot run, jump, lift, throw, press.

This is related to safety, efficacy and efficiency because technique (quality of movement) is the heart of maximizing each of these.

He or she that knows how to do these movements when confronted with them will get a better result in terms of safety. Two individuals attempt to lift a heavy object; one knows how to pop a hip and get under it (clean), and the other guy starts to pull with a rounded back. I can tell you what is likely to happen to he or she that does not know how to lift. If you want to stay safe, you better have good technique, good form.

Efficacy, for any given contractile potential, for any given limit to your total metabolic capacity, he or she that knows the technique will be able to get more work done and will develop faster. If after six months of teaching you how to clean and it still does not look like I would like it to, you will not get twice body weight overhead more quickly than someone who looks like a natural. You want an effective program, you are going to have to move with quality, you want to get the result quickly—technique is going to be pivotal to your success.

Technique is an intimate part of safety, efficacy and efficiency.

We can see how this manifests in CrossFit workouts by way of a comparison. I want to look at typing, shooting, playing the violin, NASCAR driving and CrossFit. What these domains have in common is that a marked proficiency is associated with speed. Being able to shoot accurately and quickly is better than quickly or accurately.

You may try to get a job as a typist because you do not make any mistakes. However, for this perfection, you type at a rate of 20 words a minute and only use two fingers. You will never get hired. Playing the violin fast and error-free is critical for a virtuoso. However, someone who gets through “Flight of the Bumble Bee” in 12 minutes is not there yet. A NASCAR driver wants to both drive fast and not wreck. In CrossFit, a perfectly exquisite Fran is worthless if it takes 32 minutes.

Any yet, it is presented to CrossFit coaches as, “Should I use good form or should I do it quickly?” I do not like my choices. One is impossible without the other.

Technique and speed are not at odds with one another, where “speed” is related to all the quantification of the movement: power, force, distance, time. They are seemingly at odds. It is a misapprehension. It is an illusion.

Can you learn to drive fast without wrecking? Can you learn to type fast without making errors? Can you shoot quickly without missing? Eventually, but not in the learning. One is impossible without the other.

You will not learn to type fast without typing where you make a ton of errors and then work to reduce the errors at that speed. Then you go faster, and then again pull the errors back in, then go faster and pull the errors back in. You drive faster and faster and then you spin out in the infield or you hit the wall.

If you are a race driver and you have never spun out, gone out in the infield or never been in a wreck, you are not very good. If you are a typist and you have never made a mistake, you are very slow. In CrossFit, if your technique is perfect, your intensity is always low.
Here is the part that is hard to understand: You will not maximize the intensity or the speed without mistakes. But it is not the mistakes that make you faster. It is not reaching for the letter P with your pinky and hitting the O. It is not hitting the wrong note that made you play faster. It is not missing the target by two feet that made you a better shooter. It is not running into the wall that made you a faster driver. But you will not get there without it. The errors are an unavoidable consequence of development.

This iterative process of letting this scope of errors broaden then reducing them without reducing the speed is called “threshold training.”

In a CrossFit workout, if you are moving well, I will tell you to pick up the speed. Suppose at the higher speed, the movement still looks good: I will encourage you to go faster. And if it still looks good, I will encourage you to go even faster. Now the movement starts falling apart.

I do not want you to slow down yet. First, at that speed I want you to fix your technique. What you need to do is continuously and constantly advance the margins at which form falters.

It may be that initially at 10,000 foot-pounds per minute my technique is perfect, but it falls apart at 12,000 foot-pounds per minute. Work at that 10,000-to-12,000-foot-pounds-per-minute mark to fix the form, and soon enough you will have great technique at 12,000 foot-pounds per minute. The next step is to achieve that technique at 14,000 foot-pounds per minute.

At first, the technique at 14,000 foot-pounds per minute, the technique will suffer. Then you must narrow it in. That is the process. It is ineluctable. It is unavoidable. There is nothing I can do about it. That is not my rule.

We are the technique people. We drill technique incessantly, but simultaneously I want you to go faster. You will learn to work at higher intensity with good technique only by ratcheting up the intensity where good technique is impossible. This dichotomy means that it is impossible at the limits of your capacity to obey every little detail and nuance of technique. Some of the refined motor-recruitment patterns are not going to always look perfect.

I do not know of a domain where speed matters and technique is not at the heart of it. In every athletic endeavor where we can quantify the output, there is incredible technique at the highest levels of performance.

Suppose someone set the new world record for the shot put, but his technique was poor. This means one of two things: one, either with good technique it would have gone farther, or two, we were wrong in understanding what is good technique.

Technique is everything. It is at the heart of our quantification. You will not express power in significant measure without technique. You might expend a lot of energy, but you will not see the productive application of force. You will not be able to complete functional tasks efficiently or effectively. You will not be safe in in trying.

There is a perceived paradox here that really is not a paradox when you understand the factors at play.
CrossFit has been an active combatant in the diet wars. For decades it has been an exciting world of “us” versus “them.” “We” were the low-carbohydrate, low-calorie, good fat camp and “they” were the low-fat, low-calorie, high-carbohydrate opposition. The battle was for the hearts and minds of the public on the very personal and private matter of nutrition—what diet makes us healthy?

Sheldon Margin, publisher of the University of California Berkeley Wellness Letter, a leader of “them,” accepted this characterization of battle lines when we presented it to him in 1996. In 1996, Dr. Atkins and Barry Sears were both publicly and regularly referred to as “quacks” and “frauds” by mainstream physicians, journalists, and nutritionists. While this was something that Sears would have to get used to, Dr. Atkins had been dealing with vicious assaults on his life’s work and character since publishing his Dr. Atkins’ “Diet Revolution” in 1972.

We write here today in 2003 gloating. Gloating, because it is our perception that we are decisively winning the diet war. In the public square, the realization that carbohydrates, not fat, make you sick and fat is spreading rapidly. Spreading like truth unobstructed. The position that carbohydrate is essentially toxic at common consumption levels was a truth suppressed by political and industrial corruption of science and journalism. Suppressing truth is like holding a beach ball under water; it takes constant work against a tireless resistance. They have slipped and our position sits like the beach ball on top of the water, where everyone can see it.

We interpret our position of being clearly visible, as winning the diet wars because our diet better models human nutrition and will always trump the opposition’s model if tested. Ours works, theirs does not. Where theirs...
does work, ours works better. Their success required our being kept out of the marketplace. Underwater preferably.

In countless exchanges with doctors, trainers, nutritionists, and family we shared our position and the common response was, “do you have any science? I need science.” We had science and showed it proudly. No one would read it. The cry for peer-reviewed evidence is almost always a smoke screen. The guys who write it read it—the rest pretend. If you can train people to unquestioningly accept proposition X then you have largely inoculated these same folks from even considering “not X.”

The science supporting our position while being produced at an increasing rate, was always there and is not responsible for the dramatic change over the last two years.

What has changed is that the public bought some 100 million diet books over the last 3 years, running the most important and successful science experiment ever conducted. To a constant and universal barraging of the “fat is bad” mantra from public health authorities, millions of people with no clinical or scientific credentials tried regimens found in “dangerous” books and found some of them marvelously effective.

Doctor Robert Atkins deserves credit for suffering unimaginable abuse while remaining steadfast, Gary Taubes for being the first journalist to expose the fraud and origins of the low-fat position and for later making the point that the science may have been behind Dr. Atkins all along, Barry Sears for super tuning a responsible diet, and Dr. Uffe Ravnskov for exposing the fraud and slop in anti-fat research so effectively that he needed to be completely ignored to be dealt with.

But the true heroes are each and every one of you who thought for yourselves, ignored the chorus of doctors, nutritionists, journalists and neighbors bleating like sheep, “faaat is baaaad,” followed the logic of reduced carbohydrate consumption, and then, critically and most importantly, tried the diet. You try one diet and you feel great, you try another and your teeth fall out. Who needs a doctor?

Patients are telling their doctors about the Zone and Protein Power and Atkins, not the other way around. Doctors everywhere are themselves doing the Zone and Atkins on the advice of their patients—on seeing their patients’ successes. The peer-reviewed literature remains unread, but, the reverberation of the good diet books’ message is working its way from author to reader to doctor and finally back to patients.

Perhaps, this process is not so unusual but merely another example of the efficiency of decentralized networks. In any case it is consistent with this bit of philosophy from Dr. Uffe Ravnskov’s epilogue to “The Cholesterol Myths”:

“After a lecture, a journalist asked me how she could be certain that my information was not just as biased as that of the cholesterol campaign. At first I did not know what to say. Afterwards I found the answer.

She could not be certain. Everyone must gain the truth in an active way. If you want to know something you must look at all the premises yourself, listen to all the arguments yourself, and then decide for yourself what seems to be the most likely answer. You may easily be led astray if you ask the authorities to do this work for you.

This is also the answer to those who wonder why even honest scientists are misled. And it is also the answer to those who after reading this book, ask the same question.”
For several decades now, bad science and bad politics have joined hands to produce what is arguably the most costly error in the history of science—the low-fat diet. This fad diet has cost millions unnecessary death and suffering from heart disease, diabetes and, it increasingly seems, a host of cancers and other chronic and debilitating illnesses.

Gary Taubes, the esteemed science writer, has written two brilliant and highly regarded pieces on exactly this subject. The first appeared in Science Magazine in 1999 and the second in the New York Times in 2002.

A new age is dawning in nutrition: one where the culprit is no longer seen as dietary fat but excess consumption of carbohydrate—particularly refined or processed carbohydrate. In fact, there is an increasing awareness that excess carbohydrates play a dominant role in chronic diseases such as obesity, coronary heart disease, many cancers, and diabetes. This understanding comes directly from current medical research. Amazingly, the near universal perception that dietary fat is the major culprit in obesity has no scientific foundation.

There’s a family of popular diets and diet books based on decreasing carbohydrate consumption. Most of them are excellent.

Chief among these books are Barry Sears’ “Enter the Zone,” Michael Eades’ “Protein Power,” Atkins’ Dr. Atkins’ “Diet Revolution,” Cordain’s “The Paleo Diet,” and the Hellers’ “Carbohydrate Addict’s Diet.” Each of these is an honest and accurate chronicling of the effects of the low-fat, fad diet and they all offer a rational, effective regimen for avoiding dietary ills. For those technically inclined, the mechanism by which excess carbohydrate causes disease state is known as “hyperinsulinemia.” Hyperinsulinemia is the chronic and acute elevation of insulin as a result of habitual consumption of excess carbohydrate.

The list of ills linked to hyperinsulinemia is staggering and growing. The evidence linking excess carbohydrate consumption to hyperinsulinemia and coronary heart disease is compelling if not overwhelmingly convincing.

Additionally, excess consumption of carbohydrate may soon be shown to be linked to Alzheimer’s, aging, cancers, and other disease through a process known as “glycosylation.”

A Google search for “hyperinsulinemia” reveals hundreds of ills linked to this metabolic derangement. The rapidly growing awareness of the consequences of elevated blood sugar is one of the more promising avenues of medical advancement today.

Though frightening, the diseases brought about through hyperinsulinemia can easily be avoided by minimizing carbohydrate consumption—specifically carbohydrate that gives substantial rise to blood sugar and consequently insulin levels.

There is a singular measure of carbohydrate that gives exactly this information—“Glycemic Index.” Glycemic index is simply a measure of a food’s propensity to raise blood sugar. Avoid high-glycemic foods and you will avoid many, if not most, of the ills associated with diet.

Rick Mendoza has published one of the most complete glycemic indices available anywhere with a listing of over 750 common food items giving values based on glucose’s score of 100.

We can increase the ease and utility of using such a list by dividing commonly eaten foods into two groups—one of high-glycemic foods, “bad foods”, and one of low-glycemic foods, or “good foods.” This is the rationale behind the CrossFit Shopping List.

You may notice that the “good foods” are typically meats, vegetables, fruits, nuts, and seeds, whereas the bad foods
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<td><strong>“Good Foods”–Low-Glycemic</strong></td>
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<td>Asparagus</td>
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<td>Beef</td>
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<td>Blueberries</td>
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<td>Brussel Sprouts</td>
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include many man-made or processed foodstuffs. There are some notable exceptions, but the trend is certainly instructive.

High-glycemic foods, or “bad foods”, are typically starchy, sweet, or processed foods like bread, pasta, rice, potato, grains, and desserts.

More than a few observers have pointed out that low-glycemic foods have limited shelf life and are found on the perimeter of the grocery store where the high-glycemic foods have a longer shelf life and are typically found within the grocery store’s aisles.

Glycemic Load

As stated in the “Glycemic Index” article, the Glycemic Index is a simplified classification that generally encourages people to eat more whole foods and less refined carbohydrates. This, by itself, proves its utility. However, the system is not a fool-proof strategy by which an individual should determine all dietary choices. There are high-glycemic or “bad” foods that are acceptable, and even healthy, to adopt on a regular basis.

How is this so? The Glycemic Index is calculated based on the individual eating a certain amount of carbohydrates from that food. The Glycemic Index does not take into account the actual quantity of that food eaten by the individual. While it is true that sweet potato raises blood sugar more quickly than blueberries, this is not necessarily problematic if a reasonable portion of sweet potato is consumed.

What is a reasonable portion? This is variable based on a variety of factors including body size and activity level, but this is why Zone proportions are useful in determining appropriate sized portions of any carbohydrate choice. Higher-Glycemic Index foods also allow many CrossFitters to achieve necessary amounts of carbohydrates on a reduced volume of food (i.e., not all green vegetables), which is generally more sustainable and enjoyable. As a general rule, include a greater quantity of lower-Glycemic Index foods when struggling with hunger.

Though this approach is an oversimplification of much of nutritional science, it has the power to deliver nearly all of what more detailed and elaborate regimens offer, such as those by Sears, Eades, Cordain, Atkins, and the Hellers. Eat more of the “good foods” and less of the “bad foods” and you will garner much of what the more responsible eating plans offer. Many of our friends have radically transformed their health through this single tool.
Originally published in May 2004

Our recommendation to “eat meat and vegetables, nuts and seeds, some fruit, little starch, and no sugar” is adequate to the task of preventing the scourges of diet-induced disease, but a more accurate and precise prescription is necessary to optimize physical performance.

Finely tuned, a good diet will increase energy, sense of well-being, and acumen, while simultaneously flensing fat and packing on muscle. When properly composed, the right diet can nudge every important quantifiable marker for health in the right direction.

Diet is critical to optimizing human function, and our clinical experience leads us to believe that Barry Sears’s Zone Diet closely models optimal nutrition.

CrossFit’s best performers are Zone eaters. When our second-tier athletes commit to strict adherence to the Zone parameters, they generally become top-tier performers quickly. It seems that the Zone Diet accelerates and amplifies the effects of the CrossFit regimen.

Unfortunately, the full benefit of the Zone Diet is largely limited to those who have at least at first weighed and measured their food.

For a decade, we experimented with sizing and portioning strategies that avoid scales, and measuring cups and spoons, only to conclude that natural variances in caloric intake and macronutrient composition without measurement are greater than the resolution required to turn good performance to great. Life would be much easier for us were this not so!
The “meal plans” and “block chart” (on the following pages) have been our most expedient approach for eliciting athletes’ best performances and optimal health.

Even discounting any theoretical or technical content, this portal to sound nutrition still requires some basic arithmetic and weighing and measuring portions for the first weeks.

Too many athletes, after supposedly reading Sears’ book “Enter the Zone” still ask, “So what do I eat for dinner?” They get meal plans and block charts. We can make the Zone more complicated or simpler, but not more effective. We encourage everyone to weigh and measure portions for a couple weeks because it is supremely worth the effort, not because it is fun. If you choose to “guesstimate” portions, you will have the result of CrossFit’s top performers only if and when you are lucky.

Within a couple weeks of weighing and measuring, you will have developed an uncanny ability to estimate the mass of common food portions, but, more importantly, you will have formed a keen visual sense of your nutritional needs. This is a profound awareness.

In the Zone scheme, all of humanity calculates to either 2-, 3-, 4-, or 5-block meals at breakfast, lunch, and dinner, with either 1- or 2-block snacks between lunch and dinner and again between dinner and bedtime. We have simplified the process for determining which of the four meal sizes and two snack sizes best suits your needs. We assume that you are CrossFitters; i.e., active.

Being a “4-blocker,” for instance, means that you eat three meals each day where each meal is composed of 4 blocks of protein, 4 blocks of carbohydrate, and 4 blocks of fat. Whether you are a “smallish” medium-sized guy or a “largish” medium-sized guy would determine whether you will need snacks of 1 or 2-blocks twice a day.

The “meal plans” we give stand as examples of 2-, 3-, 4-, or 5-block meals, and the “block chart” gives quantities of common foods equivalent to 1 block of protein, carbohydrate, or fat.

Once you determine that you need, say, 4-block meals, it is simple to use the block chart and select four times something from the protein list, four times something from the carbohydrate list, and four times something from the fat list every meal.

One-block snacks are chosen from the block chart at face value for a single snack of protein, carbohydrates, and fat, whereas 2-block snacks are, naturally, chosen composed of twice something from the carbohydrates list combined with twice something from the protein list, and twice something from the fats.

Every meal, every snack, must contain equivalent blocks of protein, carbohydrate, and fat.

If the protein source is specifically labeled “non-fat,” then double the usual fat blocks for that meal. Read “Enter the Zone” to learn why.

For those eating according to Zone parameters, body fat comes off fast. When our men fall below 10 percent body fat and start approaching 5 percent, we kick up the fat intake. The majority of our best athletes end up at X blocks of protein, X blocks of carbohydrate, and 4X or 5X blocks of fat. Learn to modulate fat intake to produce a level of leanness that optimizes performance.

The Zone Diet neither prohibits nor requires any particular food. It can accommodate paleo or vegan, organic or kosher, fast food or fine dining, while delivering the benefits of high-performance nutrition.
What is a Block?

A block is a unit of measure used to simplify the process of making balanced meals.

- 7 grams of protein = 1 block of protein
- 9 grams of carbohydrate = 1 block of carbohydrate
- 3 grams of fat = 1 block of fat

Since most protein sources contain fat (e.g., meat), individuals should only add 1.5 grams for each fat block when constructing meals. The block chart on the following pages outlines an amount of each item to achieve 1.5 grams of fat.

When a meal is composed of equal blocks of protein, carbohydrate, and fat, 40% of its calories are from carbohydrate, 30% from protein and 30% from fat.

The following pages contain common foods in their macronutrient category (protein, carbohydrate, or fat), along with a conversion of measurements to blocks.

This “block chart” is a convenient tool for making balanced meals. Simply choose 1 item from the protein list, 1 item from the carbohydrate list, and 1 item from the fat list to compose a 1-block meal. Or choose 2 items from each column to compose a 2-block meal, and so on.

Here is a sample 4-block meal:
- 4 oz. chicken breast
- 1 artichoke
- 1 cup of steamed vegetables with 24 crushed peanuts
- 1 sliced apple

This meal contains 28 grams of protein, 36 grams of carbohydrate, and 12 grams of fat. It is simpler, though, to think of it as a 4-block meal.

Block Prescription Based on Sex and Body Type

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Lunch</th>
<th>Snack</th>
<th>Dinner</th>
<th>Snack</th>
<th>Total Blocks</th>
<th>Body Type</th>
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<td>2</td>
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<td>2</td>
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<tr>
<td>3</td>
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<td>1</td>
<td>3</td>
<td>1</td>
<td>11</td>
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<tr>
<td>3</td>
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<td>2</td>
<td>3</td>
<td>2</td>
<td>13</td>
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</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>14</td>
<td>Athletic, well muscled female</td>
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<tr>
<td>4</td>
<td>4</td>
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<td>17</td>
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<tr>
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<td>5</td>
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<td>19</td>
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<td>4</td>
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<td>20</td>
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<td>5</td>
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<td>3</td>
<td>5</td>
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<td>21</td>
<td>Hard gainer</td>
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<td>5</td>
<td>4</td>
<td>23</td>
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<td>5</td>
<td>5</td>
<td>25</td>
<td>Athletic, well muscled male</td>
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</table>

Sample Day | Block Requirements for Small (16-Block) Male

<table>
<thead>
<tr>
<th></th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Snack</th>
<th>Dinner</th>
<th>Snack</th>
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<tr>
<td>Protein</td>
<td>4</td>
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<td>Carbohydrate</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Fat</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>PROTEINS</td>
<td>Eyeball</td>
<td>Exact Cooked (grams)</td>
<td>Exact Uncooked (grams)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>----------------------</td>
<td>------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>beef</td>
<td>1 oz.</td>
<td>26</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>beef, ground, 80% lean</td>
<td>1-1/2 oz.</td>
<td>27</td>
<td>41</td>
<td></td>
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<tr>
<td>calamari</td>
<td>1-1/2 oz.</td>
<td>39</td>
<td>45</td>
<td></td>
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</tr>
<tr>
<td>Canadian bacon</td>
<td>1 oz.</td>
<td>25</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>catfish</td>
<td>1-1/2 oz.</td>
<td>38</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cheese, cheddar</td>
<td>1 oz.</td>
<td>—</td>
<td>29</td>
<td></td>
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</tr>
<tr>
<td>cheese, cottage</td>
<td>1/4 cup</td>
<td>—</td>
<td>63</td>
<td></td>
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</tr>
<tr>
<td>cheese, feta</td>
<td>1-1/2 oz.</td>
<td>—</td>
<td>63</td>
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<td></td>
</tr>
<tr>
<td>cheese, ricotta</td>
<td>2 oz.</td>
<td>—</td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>chicken, breast</td>
<td>1 oz.</td>
<td>23</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>clams</td>
<td>1-1/2 oz.</td>
<td>27</td>
<td>48</td>
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<tr>
<td>crabmeat</td>
<td>1-1/2 oz.</td>
<td>39</td>
<td>39</td>
<td></td>
<td></td>
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<tr>
<td>duck</td>
<td>1-1/2 oz.</td>
<td>30</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>egg substitute, liquid</td>
<td>1/4 cup</td>
<td>—</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>egg, white</td>
<td>2 large</td>
<td>64</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>egg, whole</td>
<td>1 large</td>
<td>52</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>flounder/sole</td>
<td>1-1/2 oz.</td>
<td>46</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ham</td>
<td>1 oz.</td>
<td>37</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lamb, loin</td>
<td>1 oz.</td>
<td>24</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lamb, ground</td>
<td>1-1/2 oz.</td>
<td>28</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lobster</td>
<td>1-1/2 oz.</td>
<td>37</td>
<td>42</td>
<td></td>
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</tr>
<tr>
<td>pork, loin chop</td>
<td>1 oz.</td>
<td>27</td>
<td>33</td>
<td></td>
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<tr>
<td>pork, ground</td>
<td>1-1/2 oz.</td>
<td>27</td>
<td>41</td>
<td></td>
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</tr>
<tr>
<td>pork, bacon</td>
<td>1 oz.</td>
<td>20</td>
<td>56</td>
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<tr>
<td>protein powder, whey</td>
<td>1 oz.</td>
<td>—</td>
<td>—</td>
<td></td>
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</tr>
<tr>
<td>salmon</td>
<td>1-1/2 oz.</td>
<td>28</td>
<td>34</td>
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<tr>
<td>sardines</td>
<td>1 oz.</td>
<td>28</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>scallops</td>
<td>1-1/2 oz.</td>
<td>34</td>
<td>58</td>
<td></td>
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</tr>
<tr>
<td>shrimp</td>
<td>1-1/2 oz.</td>
<td>29</td>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>soy burgers</td>
<td>1/2 patty</td>
<td>45</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>soy cheese</td>
<td>1 oz.</td>
<td>25</td>
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</tr>
<tr>
<td>soy sausage, links</td>
<td>2 links</td>
<td>37</td>
<td>—</td>
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<tr>
<td>swordfish</td>
<td>1-1/2 oz.</td>
<td>39</td>
<td>36</td>
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<tr>
<td>tofu, firm</td>
<td>2 oz.</td>
<td>86</td>
<td>—</td>
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</tr>
<tr>
<td>tofu, soft</td>
<td>3 oz.</td>
<td>107</td>
<td>—</td>
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<tr>
<td>tuna steak</td>
<td>1-1/2 oz.</td>
<td>24</td>
<td>29</td>
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<table>
<thead>
<tr>
<th>PROTEINS</th>
<th>Eyeball</th>
<th>Exact Cooked (grams)</th>
<th>Exact Uncooked (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tuna, canned in water</td>
<td>1 oz.</td>
<td>36</td>
<td>—</td>
</tr>
<tr>
<td>turkey, breast</td>
<td>1 oz.</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>turkey, ground</td>
<td>1-1/2 oz.</td>
<td>26</td>
<td>36</td>
</tr>
<tr>
<td>turkey, deli meat</td>
<td>1-1/2 oz.</td>
<td>32</td>
<td>—</td>
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<table>
<thead>
<tr>
<th>FATS</th>
<th>Eyeball</th>
<th>Exact (grams)</th>
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<table>
<thead>
<tr>
<th>NUTS &amp; SEEDS</th>
<th>Eyeball</th>
<th>Exact (grams)</th>
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</thead>
<tbody>
<tr>
<td>almonds</td>
<td>~ 3</td>
<td>3</td>
</tr>
<tr>
<td>almond butter</td>
<td>1/3 tsp</td>
<td>3</td>
</tr>
<tr>
<td>cashews</td>
<td>~ 3</td>
<td>3</td>
</tr>
<tr>
<td>macadamia nuts</td>
<td>~ 1</td>
<td>2</td>
</tr>
<tr>
<td>peanut butter</td>
<td>1/2 tsp</td>
<td>3</td>
</tr>
<tr>
<td>peanuts</td>
<td>~ 6</td>
<td>3</td>
</tr>
<tr>
<td>sunflower seeds</td>
<td>1/4 tsp</td>
<td>3</td>
</tr>
<tr>
<td>walnuts</td>
<td>1 tsp</td>
<td>2</td>
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<table>
<thead>
<tr>
<th>OTHER</th>
<th>Eyeball</th>
<th>Exact (grams)</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
<th></th>
<th>1/2 cup</th>
<th>1/2 cup</th>
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42 of 136
### VEGETABLES

<table>
<thead>
<tr>
<th>Food</th>
<th>Eyeball</th>
<th>Exact Cooked (grams)</th>
<th>Exact Uncooked (grams)</th>
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<tbody>
<tr>
<td>acorn squash</td>
<td>3/8 cup</td>
<td>89</td>
<td>100</td>
</tr>
<tr>
<td>artichoke</td>
<td>1 small</td>
<td>270</td>
<td>177</td>
</tr>
<tr>
<td>arugula</td>
<td>*</td>
<td>—</td>
<td>439</td>
</tr>
<tr>
<td>asparagus</td>
<td>12 spears</td>
<td>425</td>
<td>500</td>
</tr>
<tr>
<td>bean sprouts</td>
<td>3 cups</td>
<td>265</td>
<td>217</td>
</tr>
<tr>
<td>beet green</td>
<td>1-1/4 cups</td>
<td>351</td>
<td>1450</td>
</tr>
<tr>
<td>beets</td>
<td>1/2 cup</td>
<td>112</td>
<td>135</td>
</tr>
<tr>
<td>black beans</td>
<td>1/4 cup</td>
<td>60</td>
<td>19</td>
</tr>
<tr>
<td>bok choy</td>
<td>3 cups</td>
<td>1155</td>
<td>761</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>3/4 cup</td>
<td>200</td>
<td>174</td>
</tr>
<tr>
<td>butternut squash</td>
<td>1/3 cup</td>
<td>123</td>
<td>93</td>
</tr>
<tr>
<td>cabbage</td>
<td>1-1/3 cups</td>
<td>250</td>
<td>272</td>
</tr>
<tr>
<td>carrots</td>
<td>1/2 cup</td>
<td>173</td>
<td>132</td>
</tr>
<tr>
<td>cauliflower</td>
<td>1-1/4 cups</td>
<td>500</td>
<td>304</td>
</tr>
<tr>
<td>celery</td>
<td>2 cups</td>
<td>375</td>
<td>657</td>
</tr>
<tr>
<td>chickpeas</td>
<td>1/4 cup</td>
<td>45</td>
<td>18</td>
</tr>
<tr>
<td>collard greens</td>
<td>1-1/4 cups</td>
<td>545</td>
<td>635</td>
</tr>
<tr>
<td>corn</td>
<td>1/4 cup</td>
<td>48</td>
<td>54</td>
</tr>
<tr>
<td>cucumber</td>
<td>1 (9 inch)</td>
<td>—</td>
<td>285</td>
</tr>
<tr>
<td>dill pickles</td>
<td>3 (3 inch)</td>
<td>—</td>
<td>639</td>
</tr>
<tr>
<td>eggplant</td>
<td>1-1/2 cups</td>
<td>144</td>
<td>313</td>
</tr>
<tr>
<td>fava beans</td>
<td>1/3 cup</td>
<td>63</td>
<td>27</td>
</tr>
<tr>
<td>green beans</td>
<td>1 cup</td>
<td>193</td>
<td>211</td>
</tr>
<tr>
<td>kale</td>
<td>1-1/4 cups</td>
<td>247</td>
<td>175</td>
</tr>
<tr>
<td>kidney beans</td>
<td>1/4 cup</td>
<td>55</td>
<td>26</td>
</tr>
<tr>
<td>leeks</td>
<td>1 cup</td>
<td>137</td>
<td>73</td>
</tr>
<tr>
<td>lentils</td>
<td>1/4 cup</td>
<td>74</td>
<td>17</td>
</tr>
<tr>
<td>lettuce, iceberg</td>
<td>1 head</td>
<td>—</td>
<td>508</td>
</tr>
<tr>
<td>lettuce, romaine</td>
<td>6 cups</td>
<td>—</td>
<td>760</td>
</tr>
<tr>
<td>lima beans</td>
<td>1/4 cup</td>
<td>65</td>
<td>21</td>
</tr>
<tr>
<td>mushrooms</td>
<td>3 cups</td>
<td>291</td>
<td>399</td>
</tr>
<tr>
<td>Napa cabbage</td>
<td>5 cups</td>
<td>405</td>
<td>300</td>
</tr>
<tr>
<td>okra</td>
<td>3/4 cup</td>
<td>448</td>
<td>212</td>
</tr>
<tr>
<td>onion</td>
<td>1/2 cup</td>
<td>103</td>
<td>118</td>
</tr>
<tr>
<td>parsnips</td>
<td>1/3 (9 inch)</td>
<td>67</td>
<td>68</td>
</tr>
<tr>
<td>peas</td>
<td>1/3 cup</td>
<td>250</td>
<td>180</td>
</tr>
<tr>
<td>peppers, red</td>
<td>1-1/4 cups</td>
<td>165</td>
<td>230</td>
</tr>
<tr>
<td>pinto beans</td>
<td>1/4 cup</td>
<td>52</td>
<td>19</td>
</tr>
</tbody>
</table>

### VEGETABLES

<table>
<thead>
<tr>
<th>Food</th>
<th>Eyeball</th>
<th>Exact Cooked (grams)</th>
<th>Exact Uncooked (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>potato, white</td>
<td>1/3 cup</td>
<td>48</td>
<td>68</td>
</tr>
<tr>
<td>radicchio</td>
<td>5 cups</td>
<td>—</td>
<td>250</td>
</tr>
<tr>
<td>radishes</td>
<td>2 cups</td>
<td>493</td>
<td>500</td>
</tr>
<tr>
<td>salsa</td>
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### Notes:
1) The amount for each item is to obtain 7 grams of protein, 9 grams of carbohydrate, or 1.5 grams of fat.
2) Exact data rounded to nearest whole gram.
3) Exact data from [here](#) unless not available therein.
4) Fiber in carbohydrate sources is subtracted to determine a block.
5) Tbsp. = tablespoon.
6) * mean virtually “unlimited.” Over 5 cups to accumulate a block.
### FRUITS

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### PROCESSED CARBOHYDRATES

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## Sample Zone Meals and Snacks

### 2-Block Menus

#### Breakfast

**Breakfast Quesadilla**
- 1 corn tortilla
- 1/4 cup black beans
- 1 egg (scrambled or fried)
- 1 oz. cheese
- 2 tbsp avocado

**Breakfast Sandwich**
- 1/2 pita bread
- 1 egg (scrambled or fried)
- 1 oz. cheese
- Served with 2 macadamia nuts

**Fruit Salad**
- 1/2 cup cottage cheese mixed with 1/4 cantaloupe, cubed
- 1/2 cup strawberries
- 1/4 cup grapes
- Sprinkled with 6 chopped almonds

**Smoothie**
Blend together:
- 1 cup milk
- 1 tbsp protein powder
- 1 cup frozen strawberries
- 6 cashews

**Oatmeal**
- 1/3 cup cooked oatmeal (slightly watery)
- 1/2 cup grapes
- 1/4 cup cottage cheese
- 2 tsp walnuts, chopped
- 1 tbsp protein powder
- Spice with vanilla extract and cinnamon

**Easy Breakfast**
- 1/2 cantaloupe, cubed
- 1/2 cup cottage cheese
- 6 almonds

**Steak and Eggs**
- 1 oz. steak, grilled
- 1 fried egg
- 1 slice toast with 2/3 tsp butter

#### Lunch

**Tuna Sandwich**
- 2 oz. canned tuna
- 2 tsp light mayo
- 1 slice bread

**Tacos**
- 1 corn tortilla
- 3 oz. seasoned ground meat
- 1/2 cup tomato, cubed
- 1/3 cup onion (raw), chopped
- Lettuce (as garnish), chopped
- 10 olives, chopped
- Served with Tabasco to taste

**Deli Sandwich**
- 1 slice bread
- 3 oz. sliced deli meat
- 2 tbsp avocado

**Quesadilla**
- 1 corn tortilla
- 2 oz. cheese
- 2 tbsp guacamole
- Jalapenos and salsa as garnish
- Served with 1/2 orange

**Grilled Chicken Salad**
- 2 oz. chicken, grilled
- 2 cups lettuce
- 1/4 cup tomato, chopped
- 1/4 cucumber, chopped
- 1/4 cup green pepper (raw), chopped
- 1/4 cup black beans
- 2 tbsp avocado

**Easy Lunch**
- 3 oz. deli meat
- 1 apple
- 2 macadamia nuts

#### Dinner

**Fresh Fish**
- 3 oz. fresh fish, grilled
- 1-1/3 cups zucchini (cooked), with herbs
- Serve with large salad with 1 tbsp salad dressing of choice

**Beef Stew**
Saute:
- 2/3 tsp olive oil
- 1/3 cup onion (raw), chopped
- 5/8 green pepper (raw), chopped
- ~4 oz. beef (raw), cubed
- Add:
  - 1-1/2 cups mushrooms (raw), chopped
  - 1/4 cup tomato sauce
  - Seasoned with garlic, Worcestershire sauce, salt and pepper

**Chili (serves 3)**
Saute:
- 1/3 cup onion (raw), chopped
- 5/8 cup green pepper (raw), chopped
- in garlic, cumin, chili powder, and crushed red peppers
- Add:
  - 9 oz. ground beef, browned
  - 1 cup tomato sauce
  - 1/2 cup black beans
  - 1/4 cup kidney beans
  - 30 olives, chopped
  - Add fresh cilantro to taste

**Turkey and Greens**
- 2 oz. turkey breast, roasted
- 1-1/4 cups kale, chopped and steamed
- Saute garlic and crushed red peppers in 2/3 tsp olive oil, add the steamed kale and mix.
- Serve with 1 peach, sliced

**Easy Chicken Dinner**
- 2 oz. chicken breast, baked
- 1 orange
- 2 macadamia nuts
**Breakfast**

**Breakfast Quesadilla**
- 1 corn tortilla
- 1/4 cup black beans
- 1/3 cup onions (raw), chopped
- 5/8 cup green pepper (raw), chopped
- 2 eggs (scrambled or fried)
- 1 oz. cheese
- 3 tbsp avocado

**Breakfast Sandwich**
- 1/2 pita bread
- 1 egg (scrambled or fried)
- 1 oz. cheese
- 1 oz. sliced ham

Serve with 1/2 apple and 3 macadamia nuts

**Fruit Salad**
- 3/4 cup cottage cheese
- 1/4 cantaloupe, cubed
- 1 cup strawberries
- 1/2 cup grapes
- Sprinkle with 9 chopped almonds

**Smoothie**
Blend together:
- 1 cup milk
- 2 tbsp protein powder
- 1 cup frozen strawberries
- 1/2 cup frozen blueberries
- 9 cashews

**Oatmeal**
- 2/3 cup cooked oatmeal (slightly watery)
- 1/2 cup grapes
- 1/2 cup cottage cheese
- 3 tbsp walnuts, chopped
- 1 tbsp protein powder

Spice with vanilla extract and cinnamon

**Easy Breakfast**
- 3/4 cantaloupe, cubed
- 3/4 cup cottage cheese
- 9 macadamia nuts

**Steak and Eggs**
- 2 oz. steak, grilled
- 1 fried egg
- 1 slice toast w/ 1 tsp butter
- 1/4 cantaloupe, cubed

**Lunch**

**Tuna Sandwich**
- 3 oz. canned tuna
- 3 tsp light mayo
- 1 slice bread

Serve with 1/2 apple

**Tacos**
- 2 corn tortillas
- 3 oz. seasoned ground meat
- 1 oz. grated cheese
- 1/2 cup tomato, cubed
- 2/3 cup onion (raw), chopped

Lettuce (as garnish), chopped

Serve with Tabasco to taste

15 olives, chopped

Serve with Tabasco to taste

**Deli Sandwich**
- 1 slice bread
- 3 oz. sliced deli meat
- 1 oz. cheese
- 3 tbsp avocado

Serve with 1/2 apple

**Quesadilla**
- 1 corn tortilla
- 3 oz. cheese
- 3 tbsp guacamole
- Jalapenos and salsa as garnish

Serve with 1 orange

**Grilled Chicken Salad**
- 3 oz. chicken, grilled
- 2 cups lettuce
- 1/4 cup tomato, chopped
- 1/4 cucumber, chopped
- 1/4 cup green pepper (raw), chopped
- 1/4 cup black beans
- 1/4 cup kidney beans
- 3 tbsp avocado

**Easy Lunch**
- 3 oz. deli meat
- 1 oz. sliced cheese
- 1-1/2 apples
- 3 macadamia nuts

**Dinner**

**Fresh Fish**
- 4-1/2 oz. fresh fish, grilled
- 1-1/3 cups zucchini (cooked), with herbs

Serve with large salad with 1-1/2 tbsp salad dressing of choice

1 cup strawberries

**Beef Stew**
Saute:
- 1 tsp olive oil
- 1/3 cup onion (raw), chopped
- 5/8 green pepper (raw), chopped

~6 oz. beef (raw), cubed

Add:
- 1-1/2 cups zucchini (raw), chopped
- 1-1/2 cups mushrooms (raw), chopped
- 1/2 cup tomato sauce

Season with garlic, Worcestershire sauce, salt and pepper

**Chili (serves 3)**
Saute:
- 2/3 cup onion (raw), chopped
- 1-1/4 cups green pepper (raw), chopped in garlic, cumin, chili powder, and crushed red peppers

Add:
- 13.5 oz. ground beef, browned
- 1 cup tomato sauce
- 3/4 cup black beans
- 1/2 cup kidney beans
- 45 olives, chopped

Add fresh cilantro to taste

**Turkey and Greens**
- 3 oz. turkey breast, roasted
- 2-1/2 cups kale, chopped and steamed

Saute garlic and crushed red peppers in 1 tsp olive oil, add the steamed kale and mix.

Serve with 1 peach, sliced

**Easy Dinner**
- 3 oz. chicken breast, baked
- 1-1/2 oranges
- 3 macadamia nuts
## 4-Block Menus

### Breakfast

#### Breakfast Quesadilla
- 1 corn tortilla
- 1/2 cup black beans
- 1/3 cup onions (raw), chopped
- 5/8 green pepper (raw), chopped
- 2 eggs (scrambled or fried)
- 2 oz. cheese
- 4 tbsp avocado

#### Breakfast Sandwich
- 1/2 pita bread
- 2 eggs (scrambled or fried)
- 1 oz. cheese
- 1 oz. sliced ham
- Serve with 1 apple and 4 macadamia nuts

#### Fruit Salad
- 1 cup cottage cheese
- 1/2 cantaloupe, cubed
- 1 cup strawberries
- 1/2 cup grapes
- Sprinkled with 12 chopped almonds

#### Smoothie
- Blend together:
  - 2 cups milk
  - 2 tbsp protein powder
  - 1 cup frozen strawberries
  - 1/2 cup frozen blueberries
  - 12 cashews

#### Oatmeal
- 1 cup cooked oatmeal (slightly watery)
- 1/2 cup grapes
- 3/4 cup cottage cheese
- 4 tsp walnuts, chopped
- 1 tbsp protein powder
- Spice with vanilla extract and cinnamon

#### Easy Breakfast
- 1 cantaloupe, cubed
- 1 cup cottage cheese
- 12 almonds

#### Steak and Eggs
- 3 oz. steak, grilled
- 1 fried egg
- 1 slice bread with 1-1/3 tsp butter
- 1/2 cantaloupe, cubed

### Lunch

#### Tuna Sandwich
- 4 oz. canned tuna
- 4 tsp light mayo
- 1 slice bread
- Serve with 1 apple

#### Tacos
- 2 corn tortillas
- 4-1/2 oz. seasoned ground meat
- 1 oz. cheese, grated
- 1/2 cup tomato, cubed
- 1/3 cup onion (raw), chopped
- Lettuce (as garnish), chopped
- 20 olives, chopped
- Serve with Tabasco to taste
- Serve with 1/2 apple

#### Deli Sandwich
- 2 slices of bread
- 4-1/2 oz. sliced deli meat
- 1 oz. cheese
- 4 tbsp avocado

#### Quesadilla
- 2 corn tortillas
- 4 oz. cheese
- 4 tbsp guacamole
- Jalapenos and salsa as garnish
- Serve with 1 orange

#### Grilled Chicken Salad
- 4 oz. chicken, grilled
- 2 cups lettuce
- 1/4 cup tomato, chopped
- 1/4 cucumber, chopped
- 1/4 cup green pepper (raw), chopped
- 1/2 cup black beans
- 1/4 cup kidney beans
- 4 tbsp avocado

#### Easy Lunch
- 4-1/2 oz. deli meat
- 1 oz. cheese
- 1 apple
- 1 grapefruit
- 4 macadamia nuts

### Dinner

#### Fresh Fish
- 6 oz. fresh fish, grilled
- 1-1/3 cups zucchini (cooked), with herbs
- Serve with large salad with 2 tbsp salad dressing of choice
- 2 cups strawberries

#### Beef Stew
- Saute:
  - 1-1/3 tsp olive oil
  - 1/3 cup onion (raw), chopped
  - 5/8 green pepper (raw), chopped
- ~8 oz. (beef (raw), cubed)
- Add:
  - 1-1/2 cups zucchini (raw), chopped
  - 1-1/2 cups mushrooms (raw), chopped
  - 1 cup tomato sauce
- Season with garlic, Worcestershire sauce, salt and pepper
- Serve with 1 cup strawberries

#### Chili (serves 3)
- Saute:
  - 2/3 cup onion (raw), chopped
  - 1-1/4 cups green pepper (raw), chopped
  - in garlic, cumin, chili powder, and crushed red peppers
- Add:
  - 18 oz. ground beef, browned
  - 2 cups tomato sauce
  - 3/4 cup black beans
  - 3/4 cup kidney beans
  - 60 olives, chopped
- Add fresh cilantro to taste

#### Turkey and Greens
- 4 oz. turkey breast, roasted
- 2-1/2 cups kale, chopped and steamed
- Saute garlic and crushed red peppers in 1-1/3 tsp olive oil, add kale and mix.
- Serve with 2 peaches, sliced

#### Easy Dinner
- 4 oz. chicken breast, baked
- 2 oranges
- 4 macadamia nuts
### Breakfast

#### Breakfast Quesadilla
- 2 corn tortillas
- 1/2 cup black beans
- 1/3 cup onions (raw), chopped
- 5/8 cup green pepper (raw), chopped
- 3 eggs (scrambled or fried)
- 2 oz. cheese
- 5 tbsp avocado

#### Breakfast Sandwich
- 1/2 pita bread
- 2 eggs (scrambled or fried)
- 2 oz. cheese
- 1 oz. ham, sliced
- Serve with 1-1/2 apples and 5 macadamia nuts

#### Fruit Salad
- 1-1/4 cups cottage cheese
- 1/2 cantaloupe, cubed
- 1 cup strawberries
- 1 cup grapes
- Sprinkle with 15 chopped almonds

#### Smoothie
- Blend together:
  - 2 cups milk
  - 3 tbsp protein powder
  - 2 cups frozen strawberries
  - 1/2 cup frozen blueberries
  - 15 cashews

#### Oatmeal
- 1 cup cooked oatmeal (slightly watery)
- 1 cup grapes
- 1 cup cottage cheese
- 5 tsp walnuts, chopped
- 1 tbsp protein powder
- Spice with vanilla extract and cinnamon

#### Easy Breakfast
- 1-1/4 cantaloupe, cubed
- 1-1/4 cups cottage cheese
- ~ 15 almonds

#### Steak and Eggs
- 3 oz. steak, grilled
- 2 fried eggs
- 1 slice bread with 1-2/3 tsp butter
- 3/4 cantaloupe, cubed

### Lunch

#### Tuna Sandwich
- 5 oz. canned tuna
- 5 tsp light mayo
- 1 slice bread
- Serve with 1-1/2 apples

#### Tacos
- 2 corn tortillas
- 6 oz. seasoned ground meat
- 1 oz. cheese, grated
- 1/2 cup tomato, cubed
- 1/3 cup onion (raw), chopped
- Lettuce (as garnish), chopped
- 25 olives, chopped
- Serve with Tabasco to taste
- Serve with 1 apple

#### Deli Sandwich
- 2 slices bread
- 4-1/2 oz. deli meat
- 2 oz. cheese
- 5 tbsp avocado
- 1/2 apple

#### Quesadilla
- 2 corn tortillas
- 5 oz. cheese
- 5 tbsp guacamole
- Jalapenos and salsa as garnish
- Serve with 1-1/2 oranges

#### Grilled Chicken Salad
- 5 oz. chicken, grilled
- 2 cups lettuce
- 1/4 cup tomato, chopped
- 1/4 cucumber, chopped
- 1/4 cup green pepper (raw), chopped
- 1/2 cup black beans
- 1/2 cup kidney beans
- 5 tbsp avocado

#### Easy Lunch
- 4-1/2 oz. deli meat
- 2 oz. cheese
- 1-1/2 apples
- 1 grapefruit
- 5 macadamia nuts

### Dinner

#### Fresh Fish
- 7-1/2 oz. fresh fish, grilled
- 1-1/3 cups zucchini (cooked), with herbs
- Serve with large salad with 1/4 cup black beans and 2-1/2 tbsp salad dressing of choice
- 2 cups strawberries

#### Beef Stew
- Saute:
  - 1-2/3 tsp olive oil
  - 2/3 cup onion (raw), chopped
  - 1-1/4 cups green pepper (raw), chopped
  - ~10 oz. beef (raw), cubed
- Add:
  - 1-1/2 cups zucchini (raw), chopped
  - 1-1/2 cups mushrooms (raw), chopped
  - 1 cup tomato sauce
- Season with garlic, Worcestershire sauce, salt and pepper
- Serve with 2 cups strawberries

#### Chili (serves 3)
- Saute:
  - 2/3 cup onion (raw), chopped
  - 2-1/2 cups green pepper (raw), chopped
  - in garlic, cumin, chili powder, and crushed red peppers
- Add:
  - 22.5 oz. ground beef, browned
  - 2 cups tomato sauce
  - 1 cup black beans
  - 1 cup kidney beans
  - 75 olives, chopped
- Add fresh cilantro to taste

#### Turkey and Greens
- 5 oz. turkey breast, roasted
- 2-1/2 cups kale, chopped and steamed
- Saute garlic and crushed red peppers in 1-2/3 tsp olive oil, add steamed kale and mix.
- Serve with 3 peaches, sliced

#### Easy Dinner
- 5 oz. chicken breast, baked
- 2-1/2 oranges
- 5 macadamia nuts
### 1-Block Snacks

<table>
<thead>
<tr>
<th>1 hard-boiled egg</th>
<th>1 poached egg</th>
<th>1/4 cup cottage cheese</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 orange</td>
<td>1/2 slice bread</td>
<td>1/2 cup pineapple</td>
</tr>
<tr>
<td>6 peanuts</td>
<td>1/2 tsp peanut butter</td>
<td>6 peanuts</td>
</tr>
<tr>
<td>1/2 cup plain yogurt</td>
<td>Sprinkled with 3 cashews, chopped</td>
<td>1 oz. sardines</td>
</tr>
<tr>
<td>1 oz. cheese</td>
<td>1/4 cup cottage cheese</td>
<td>1/2 nectarine</td>
</tr>
<tr>
<td>1/2 apple</td>
<td>1/2 carrot</td>
<td>5 olives</td>
</tr>
<tr>
<td>1 macadamia nut</td>
<td>3 celery stalks</td>
<td>1-1/2 oz. feta cheese</td>
</tr>
<tr>
<td>1 oz. canned chicken or tuna</td>
<td>1 oz. soft tofu</td>
<td>1 cup diced tomato</td>
</tr>
<tr>
<td>1 peach</td>
<td>1/2 apple</td>
<td>5 olives</td>
</tr>
<tr>
<td>1/2 tsp peanut butter</td>
<td>1/2 tsp peanut butter</td>
<td>1-1/2 oz. salmon</td>
</tr>
<tr>
<td>1-1/2 oz. deli-style ham or turkey</td>
<td>1 oz. tuna</td>
<td>1/3 tsp olive oil</td>
</tr>
<tr>
<td>1 carrot</td>
<td>1 large tossed salad</td>
<td>1-1/2 oz. shrimp</td>
</tr>
<tr>
<td>5 olives</td>
<td>1 tsp salad dressing of choice</td>
<td>2 cups broccoli (raw)</td>
</tr>
<tr>
<td>1 oz. mozzarella string cheese</td>
<td>1 hard boiled egg</td>
<td>1 oz. Canadian bacon</td>
</tr>
<tr>
<td>1/2 cup grapes</td>
<td>1 large spinach salad</td>
<td>1 plum</td>
</tr>
<tr>
<td>1 tbsp avocado</td>
<td>1 tsp salad dressing of choice</td>
<td>1 macadamia nut</td>
</tr>
<tr>
<td>1 oz. jack cheese</td>
<td>1 oz. grilled turkey breast</td>
<td>1-1/2 oz. deli-style turkey</td>
</tr>
<tr>
<td>1 tbsp guacamole</td>
<td>1/2 cup blueberries</td>
<td>1 tangerine</td>
</tr>
<tr>
<td>1 cup tomato</td>
<td>3 cashews</td>
<td>1 tbsp avocado</td>
</tr>
<tr>
<td>1 cup strawberries</td>
<td>Blend:</td>
<td>1/4 cup cottage cheese</td>
</tr>
<tr>
<td>1/4 cup cottage cheese</td>
<td>1 cup water</td>
<td>1 cup sliced tomato</td>
</tr>
<tr>
<td>1 macadamia nut</td>
<td>1 tbsp protein powder</td>
<td>1/3 tsp olive oil</td>
</tr>
<tr>
<td></td>
<td>1/2 cup grapes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/3 tsp coconut oil</td>
<td></td>
</tr>
<tr>
<td>Blend:</td>
<td>1 cup water</td>
<td>1-1/2 oz. scallops</td>
</tr>
<tr>
<td></td>
<td>1/2 oz. spirulina</td>
<td>1 sliced cucumber</td>
</tr>
<tr>
<td></td>
<td>1 cup frozen strawberries</td>
<td>1/2 tsp tartar sauce</td>
</tr>
<tr>
<td></td>
<td>3 cashews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 oz. cheddar cheese melted over</td>
<td>1 oz. lamb</td>
</tr>
<tr>
<td></td>
<td>1/2 apple</td>
<td>1/4 cup chick peas</td>
</tr>
<tr>
<td>Sprinkled with 1 tsp walnuts, chopped</td>
<td></td>
<td>1/3 tsp tahini</td>
</tr>
</tbody>
</table>
Typical CrossFit Block Prescriptions and Adjustments

To best understand the Zone Diet, CrossFitters should read Dr. Barry Sears book “Enter the Zone.” This article gives more information regarding block prescriptions and “fat intake” adjustments for CrossFitters.

The chart based on sex and body type in the “Zone Meal Plans” article is perfect way to begin the Zone. In cases where the athlete chooses the wrong block size, this can be modified after a few weeks once the desired results are not achieved. While starting at a block higher or lower than ideal may slow progress, it is infinitely more important to start weighing and measuring intake than not to start at all.

Dr. Barry Sears details a more precise method to calculate one’s block prescription in “Enter the Zone.” It is:

\[ \text{Zone block prescription} = \text{lean body mass (lb.)} \times \text{activity level (g/lb. of lean body mass)} / 7 (g \text{ protein/block}) \]

The activity level ranges on a scale of 0-1. For those who work out several days a week and do not have a labor-intensive job, the activity level should be 0.7 (most CrossFitters). This simplifies to a Zone block prescription that is 10 percent of lean mass.

The activity factor should increase if the athlete does CrossFit two or more times a day, trains for another sport in addition to CrossFit, or holds a strenuous daily job (e.g., construction, farming, etc., and potentially coaching, if on one’s feet all day). Although CrossFit workouts are relatively intense, they are not long in duration. An individual does not need to increase the activity level value based on intensity alone; activity volume determines this.

**Sample Calculation Of The Zone Block Prescription**

Suppose an athlete is 185 lb. (84 kg) with 16 percent body fat. He does CrossFit five days per week and works in a typical office environment. A sample calculation of his Zone block prescription follows.

First, lean body mass is calculated (calipers are a convenient, easy-to-use, and reasonably accurate method):

\[ \text{lean body mass} = 185 \text{ lb.} - (0.16 \times 185 \text{ lb.}) \\
= 185 \text{ lb.} - 29.6 \text{ lb.} = 155.4 \text{ lb.} \]

Because the activity factor is 0.7, the simplified formula is used:

\[ \text{block prescription} = 155.4 \text{ lb.} \times 0.10 \\
= 15.54 \text{ or } \sim 15 \text{ blocks} \]

This means that the example athlete above would eat 15 blocks/day, or:

<table>
<thead>
<tr>
<th>Protein</th>
<th>15 blocks * 7 g</th>
<th>= 105 g (420 calories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate</td>
<td>15 blocks * 9 g</td>
<td>= 135 g (540 calories)</td>
</tr>
<tr>
<td>Fat</td>
<td>15 blocks * 3 g</td>
<td>= 45 g (405 calories)</td>
</tr>
<tr>
<td>Total Calories</td>
<td></td>
<td>= 1,365</td>
</tr>
</tbody>
</table>

Note, the total calories presented here are underestimated due to hidden calories. Most foods are classified by a single macronutrient, despite some other macronutrients present (e.g., nuts are classified as a fat, but have some protein and carbohydrate calories). These less predominant macronutrients for each source are not included in the total calorie calculations.

This athlete could also choose to round up to 16 blocks, particularly if the athlete is more likely to have compliance issues. The Zone prescription is a calorie-restrictive diet and can be difficult especially for new-adopters. Rounding up to the next whole block when one’s calculation has a decimal value may result in a slower progress, but may also get better long-term compliance. Once the athlete has become accustomed to the diet, then the total blocks can
be lowered to 15, particularly if desired body composition is not yet achieved.

**Increasing Fat Intake**
The caloric restriction leans out the athlete while providing enough protein and carbohydrate for typical CrossFit activity levels. However, the athlete can become too lean. The athlete is considered “too lean” when performance decreases in combination with continued weight loss. “Too lean” should not be based on body-weight or appearance alone. When a loss of mass coincides with a drop in performance, the athlete needs to add calories to the diet. This can be accomplished by doubling the fat intake.

For the 15-block example athlete, daily food intake at two times the fat would be:

<table>
<thead>
<tr>
<th>15 blocks * 7 g</th>
<th>= 105 g (420 calories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 blocks * 9 g</td>
<td>= 135 g (540 calories)</td>
</tr>
<tr>
<td>30 blocks * 3 g</td>
<td>= 90 g (810 calories)</td>
</tr>
<tr>
<td>Total Calories</td>
<td>= 1,770</td>
</tr>
</tbody>
</table>

At five times the fat, the macronutrient ratio based on calories has changed to: 14% protein, 18% carbohydrate, 68% fat. At twice the fat, the macronutrient ratio based on calories has changed from 30% protein, 40% carbohydrate, 30% fat to: 23% protein, 31% carbohydrate, 46% fat. Fat can continue to be multiplied if the athlete has further mass loss and performance decline. Many CrossFit athletes have a diet including five times the fat.

For the 15-block athlete, daily food intake at five times the fat would be:

<table>
<thead>
<tr>
<th>15 blocks * 7 g</th>
<th>= 105 g (420 calories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 blocks * 9 g</td>
<td>= 135 g (540 calories)</td>
</tr>
<tr>
<td>75 blocks * 3 g</td>
<td>= 225 g (2,025 calories)</td>
</tr>
<tr>
<td>Total Calories</td>
<td>= 2,985</td>
</tr>
</tbody>
</table>

At five times the fat, the macronutrient ratio based on calories has changed to: 14% protein, 18% carbohydrate, 68% fat.
Avoiding Disease

Originally published in October 2007

Nutrition can be a touchy topic, like politics or religion, that people take very personally, but good nutrition is the foundation not only for general health but also for high-performance fitness. Much of the public information about diet, particularly the emphasis on low-fat and high-carbohydrates, has resulted in a near epidemic of obesity and type II diabetes. In this first of a two-part lecture excerpt, Coach Glassman explores some of the science behind nutrition and the body, particularly the role of insulin in health and disease. "Syndrome X," the "deadly quartet" (obesity, glucose intolerance, high blood pressure, high triglycerides), and coronary heart disease, he claims, are avoidable through dietary means.

Video (13 min)

Optimizing Performance

Originally published in November 2007

This addresses the refined dietary needs of athletes and what is required to optimize your performance. If you want elite physical output, you must be precise about your intake. "Close enough" will not cut it-or as Coach Glassman says, "If you want top-fuel-type performance, you need top fuel; you can't just piss into the gas tank."

Most of us are familiar with CrossFit’s nutrition prescription: Eat meat and vegetables, nuts and seeds, some fruit, little starch, and no sugar. But to achieve top performance, you have to be specific about the balances of those things and accurate in your macronutrient consumption. You can get far on the workouts alone, but you will not—cannot-reach your true potential without getting particular about your fuel. There's a 1:1 correspondence between elite CrossFit performance and accuracy and precision in consumption.

Video (13 min)
Whole, unprocessed foods are the best source of both macronutrients and micronutrients in terms of composition, variety, and density, such that supplementation is generally not recommended. We contend that eating a high-quality whole food-based diet in known quantities are the most important tenets of nutrition for improved performance and health. Not only are supplements generally poorer nutrient sources, but they are also an unnecessary focus for someone not following our basic diet plan of weighed and measured meat and vegetables, etc.

However, there is one supplement that we find is beneficial enough to make a blanket recommendation, and that is fish oil. Fish oil provides omega-3 fatty acids, which are a type of polyunsaturated fat.

Physiological fats are known as triglycerides in biological terms; they are composed of a glycerol backbone with three fatty acids attached (Figure 1). The attached fatty acids are mixtures of saturated, monounsaturated, and polyunsaturated fats. Although one fatty acid is prominent in each food, all three are represented to some degree. Figure 2 provides a summary of the types of fat and example foods of each.

The two types of polyunsaturated fats found most frequently in foods are omega-3 and omega-6 fats. Classifying a fatty acid as omega-3 vs. omega-6 is dependent on chemical structure. Polyunsaturated fats are sources of the two essential fatty acids, meaning they must be obtained from the diet. They are alpha-linolenic acid (ALA) (an omega-3) and linoleic acid (LA) (an omega-6). Omega-3 fats are known as “anti-inflammatory” fats, and omega-6 fats are known as “pro-inflammatory” fats based on their physiological functions. Both are needed in relatively equal quantities.

Current diets tend to have too many omega-6 fats, pushing the balance towards pro-inflammatory physiological processes. The current omega-6:omega-3 ratio is approximately 20:1 and higher, where primitive populations likely had a ratio closer to 2:1. Sources of omega-6 fats to the diet are: vegetable oils, nuts, conventionally raised (grain fed/feed lot) meat and eggs, and farm-raised fish. Eliminating processed food according to our diet should reduce exposure to omega-6 fats from vegetable oils. However, most meat and eggs are conventionally raised, which result in greater omega-6 content than if they were wild or grass-fed. Nuts and seeds also have more omega-6 fats than omega-3. Therefore, it is possible that even though one eats the foods on our list, his or her diet could still be pro-inflammatory relative to the ancestral past.

Fish-oil supplementation improves the ratio of omega-6 to omega-3 fatty acids and reduces the inflammatory responses in the body. Fish oil provides two types of omega-3 fatty acids: eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), the form of omega-3 fats preferred by the brain and body. The body can convert ALA to EPA and DHA, but the conversion process is inefficient. Some practitioners have recommended a combined daily intake on the order of 3 grams of EPA and DHA for an otherwise healthy individual, although the exact amount is dictated by one’s total omega-6 intake. Each brand of fish oil has a different concentration of EPA.
Supplementation, continued

![Table of Fatty Acids]

<table>
<thead>
<tr>
<th>FATTY ACIDS</th>
<th>SATURATED</th>
<th>MONOUNSATURATED</th>
<th>POLYUNSATURATED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>most stable</td>
<td>less stable</td>
<td>least stable</td>
</tr>
<tr>
<td></td>
<td>Coconut Oil, Butter</td>
<td>Olive Oil, Avocado</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OMEGA-3</th>
<th>OMEGA-9</th>
<th>OMEGA-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>anti-inflammatory</td>
<td>non-essential</td>
<td>pro-inflammatory</td>
</tr>
<tr>
<td>Alpha Linolenic Acid (ALA)</td>
<td>Gamma Linolenic Acid (GLA)</td>
<td>Linoleic Acid (LA)</td>
</tr>
<tr>
<td>Flax Seed</td>
<td>Barrage Seed Oil, Evening Primrose Oil</td>
<td>Nuts, Grains, Vegetable Oils, Grain-fed Meats and Eggs</td>
</tr>
<tr>
<td>Eicosapentaeonoic Acid (EPA)</td>
<td>Docosahexaeonoic Acid (DHA)</td>
<td></td>
</tr>
<tr>
<td>Fish, Algae, Grass-fed/ Pasture-raised Meat and Eggs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**APPROXIMATE PALEO ERA RATIO**
2 OMEGA-6 : 1 OMEGA-3

**CURRENT RATIO**
20 OMEGA-6 : 1 OMEGA-3
pro-inflammatory

Figure 2. Summary of Fatty Acids and Example Food Sources.

Research has indicated positive health benefits by supplementing with fish oil. Omega-3 fats help increase the fluidity of cell membranes, and research has indicated supplementation can improve insulin sensitivity, cardiovascular function, nervous-system function, immune health, memory, and mood issues. Omega-3’s also function as an anti-coagulant, so military personnel should consider removing fish oil supplements from their diet a couple of weeks prior to deployment. It may also be appropriate for those with an upcoming surgery to stop taking fish oil two weeks from that date. These

and DHA per serving as indicated on the label. Individuals may have to take multiple servings to get 3 grams of EPA and DHA, as brands may include omega-3s that are not either (e.g., ALA). Flax seed or oil is not an appropriate supplement for omega-3’s. Flax is a good source of ALA, but because of the poor conversion to EPA and DHA, it is not recommended. If the individual is vegan, DHA can be obtained with algae oil.
individuals should talk with their doctor regarding these circumstances.

It is possible to avoid omega-3 supplementation depending on food intake, although the individual needs to be fastidious with his or her diet. This could be accomplished by avoidance of all vegetable oils (which are used at most every restaurant), and nuts and seeds. Meat would have to be grass-fed, eggs pasture raised, and wild-caught fish should be consumed a few times a week. Because this is not practical for many people, supplementation is used.

Besides the ratio of omega-6 to omega-3’s in the diet, the total amount of polyunsaturated fat is an important consideration. It is not ideal to take in high doses of either omega-6 (vegetable oils, nuts) or omega-3 fats (based on the stability of polyunsaturated fats relative to other fats, Figure 2). Fish oil supplementation does not negate the effects of a bad diet (e.g., eating fast food or excessive amounts of nuts and nut butters). The total recommended polyunsaturated fat intake in a diet is not well-established; an equal representation of the three fats appears prudent. Individuals should work with a primary care doctor to determine if supplementation is appropriate, particularly in cases with specific medical conditions.
A Theoretical Template for CrossFit’s Programming

Originally published in February 2003

The “What is Fitness?” article explores the aims and objectives of our program. Most of you have a clear understanding of how we implement our program through familiarity with the Workout of the Day (WOD) from our website. What is likely less clear is the rationale behind the WOD or more specifically what motivates the specifics of CrossFit’s programming. It is our aim in this article to offer a model or template for our workout programming in the hope of elaborating on the CrossFit concept and potentially stimulating productive thought on the subject of exercise prescription (generally) and workout construction (specifically). What we want to do is bridge the gap between an understanding of our philosophy of fitness and the workouts themselves, that is, how we get from theory to practice. CrossFit.com has never used this template for its programming, but it provides new trainers a way to effectively apply variance within the tenets of CrossFit’s methodology.

At first glance, the template seems to be offering a routine or regimen. This may seem at odds with our contention that workouts need considerable variance or unpredictability to best mimic the often unforeseeable challenges that combat, sport, and survival demand and reward. We have often said, “What your regimen needs is to not become routine.” But the model we offer allows for wide variance of mode, exercise, metabolic pathway, rest, intensity, sets, and reps. In fact, it is mathematically likely that each three-day cycle is a singularly unique stimulus never to be repeated in a lifetime of CrossFit workouts.

The template is engineered to allow for a wide and constantly varied stimulus, randomized within some parameters, but still true to the aims and purposes of CrossFit. Our template contains sufficient structure to formalize or define our programming objectives while not setting in stone parameters that must be left to variance if the workouts are going to meet our needs. That is our mission—to ideally blend structure and flexibility.

It is not our intention to suggest that your workouts should, or that our workouts do, fit neatly and cleanly within the template, for that is absolutely not the case. But, the template does offer sufficient structure to aid comprehension, reflect the bulk of our programming concerns, and not hamstring the need for radically varying stimulus. So as not to seem redundant, what we are saying here is that the purpose of the template is as much descriptive as prescriptive.

Template Macro View

In the broadest view we see a three-days-on, one-day-off pattern. We have found that this allows for a relatively higher volume of high-intensity work than the many others that we have experimented with. With this format the athlete can work at or near the highest intensities possible for three straight days, but by the fourth day both neuromuscular function and anatomy are hammered to the point where continued work becomes noticeably less effective and impossible without reducing intensity.

The chief drawback to the three-days-on, one-day-off regimen is that it does not sync with the five-days-on, two-days-off pattern that seems to govern most of the world’s work habits. The regimen is at odds with the seven-day week. Many of our clients are running programs within professional settings, where the five-day workweek with weekends off is de rigueur. Others have found that the scheduling needs of family, work, and school require scheduling workouts on specific days of the week every week. For these people we have devised a five-days-on, two-days-off regimen that has worked very well.

The workout of the day was originally a five-on, two-off pattern and it worked perfectly. But the three-on, one-off pattern was devised to increase both the intensity and recovery of the workouts and the feedback we have received and our observations suggest that it was successful in this regard.
If life is easier with the five-on, two-off pattern, do not hesitate to employ it. The difference in potential between the two may not warrant restructuring your entire life to accommodate the more effective pattern. There are other factors that will ultimately overshadow any disadvantages inherent in the potentially less effective regimen, such as convenience, attitude, exercise selection, and pacing.

For the remainder of this article the three-day cycle is the one in discussion, but most of the analysis and discussion applies perfectly to the five-day cycle.

Elements By Modality
Looking at the Template Macro View (Table 1) it can readily be seen that the template is based on the rotation of three distinct modalities: monostructural metabolic conditioning (“M”), gymnastics (“G”), and weightlifting (“W”). The monostructural metabolic conditioning activities are commonly referred to as “cardio,” the purpose of which is primarily to improve cardiorespiratory capacity and stamina. They are repetitive, cyclical movements that could be sustained for long periods of time. The gymnastics modality comprises body-weight exercises/elements or calisthenics and its primary purpose is to improve body control by improving neurological components such as coordination, balance, agility, and accuracy, and to improve functional upper body capacity and trunk strength. The weightlifting modality comprises the most important weight-training basics, Olympic lifts and powerlifting, where the aim is primarily to increase strength, power, and hip/leg capacity. This category includes any exercise with the addition of an external load.

“The magic is in the movement, the art is in the programming, the science is in the explanation, and the fun is in the community.”

-Coach Glassman
Table 2 gives the common exercises used by our program, separated by modality, in fleshing out the routines.

For metabolic conditioning the exercises are run, bike, row, and jump rope. The gymnastics modality includes air squats, pull-ups, push-ups, dips, handstand push-ups, rope climbs, muscle-ups, presses to handstands, back/hip extensions, sit-ups, and jumps (vertical, box, broad, etc.). The weightlifting modality includes deadlifts, cleans, presses, the snatch, the clean and jerk, medicine-ball drills and throws, and kettlebell swings.

The elements, or exercises, chosen for each modality were selected for their functionality, neuroendocrine response, and overall capacity to dramatically and broadly impact the human body.

Workout Structure
The workout structure varies by the inclusion of one, two, or three modalities for each day (Table 3). Days 1, 5, and 9 are each single-modality workouts whereas days 2, 6, and 10 include two modalities each (couplets), and finally, days 3, 7, and 11 use three modalities each (triplets). In every case each modality is represented by a single exercise or element; i.e., each M, W, and G represents a single exercise from metabolic conditioning, weightlifting, and gymnastics modalities respectively.

When the workout includes a single exercise (days 1, 5, and 9) the focus is on a single exercise or effort. When the element is the single “M” (day 1) the workout is a single effort and is typically a long, slow, distance effort. When the modality is a single “G” (day 5) the workout is practice of a single skill and typically this skill is sufficiently complex to require great practice and may not be yet suitable for inclusion in a timed workout because performance is not yet adequate for efficient inclusion. When the modality is the single “W” (day 9) the workout is a single lift and typically performed at high-weight and low-repetition. It is worth repeating that the focus on days 1, 5, and 9 is single efforts of “cardio” at long distance, improving high-skill more complex gymnastics movements, and single/low-rep heavy weightlifting basics, respectively. This is not the day to work sprints, pull-ups, or high-repetition clean and jerk—the other days would be more appropriate.

On the single-element days (1, 5, and 9), recovery is not a limiting factor. For the “G” and “W” days rest is long and deliberate and the focus is kept clearly on improvement of the element and not on total metabolic effect.

For the two-element days (2, 6, and 10), the structure is typically a couplet of exercises performed alternately until repeated for a total of 3-5 rounds and performed for time. We say these days are “task priority” because the task is set...
Table 3. Workout Structure

<table>
<thead>
<tr>
<th>Days</th>
<th>Single-Element Days (1, 5, 9)</th>
<th>Two-Element Days (2, 6, 10)</th>
<th>Three-Element Days (3, 7, 11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority</td>
<td>Element Priority</td>
<td>Task Priority</td>
<td>Time Priority</td>
</tr>
<tr>
<td>Structure</td>
<td>M: Single Effort</td>
<td>Couplet repeated 3-5 times for time</td>
<td>Triplet repeated for 20 minutes for rotations</td>
</tr>
<tr>
<td>(set structure)</td>
<td>G: Single Skill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(intensity)</td>
<td>W: Single Lift</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Recovery</td>
<td>Recovery not a limiting factor</td>
<td>Work/rest interval management critical</td>
<td>Work/rest interval marginal factor</td>
</tr>
</tbody>
</table>

and the time varies. The workout is most often scored by the time required to complete the prescribed rounds. The two elements themselves are designed to be moderate to high-intensity and work-rest interval management is critical. These elements are made intense by pace, load, reps or some combination. Ideally, the first round is hard but possible, whereas the second and subsequent rounds will require pacing, rest, and breaking the task up into manageable efforts.

For the three-element days (3, 7, and 11), the structure is typically a triplet of exercises, this time repeated for a specified number of minutes and scored by number of rotations or repetitions completed. We say these workouts are “time priority” because the athlete is kept moving for a specified time and the goal is to complete as many cycles as possible. The elements are chosen in order to provide a challenge that manifests only through repeated cycles. Ideally the elements chosen are not significant outside of the blistering pace required to maximize rotations completed within the time (typically 20 minutes) allotted. This is in stark contrast to the two-element days, where the elements are of a much higher intensity. This workout is tough, extremely tough, but managing work-rest intervals is a marginal factor.

Each of the three distinct days has a distinct character. Generally speaking, as the number of elements increases from one to two to three, the workout’s effect is due less

“A strength and conditioning regimen devoid of gymnastics practice and skills is deficient.”

-Coach Glassman

to the individual element selected and more to the effect of repeated efforts. Table 4 depicts workout examples following this template.

Application
The template in discussion does not generate the CrossFit.com Workout of the Day, but the qualities of one-, two-, and three-element workouts expressed there motivated the template’s design. Our experience in the gym and the feedback from our athletes following the WOD have demonstrated that the mix of one-, two-, and three-
Table 4. Workout Examples Using the Template

<table>
<thead>
<tr>
<th>Days</th>
<th>Days</th>
<th>Workout Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>Run 10k</td>
</tr>
<tr>
<td>2</td>
<td>G W</td>
<td>(5 handstand push-ups/225 x 5 deadlifts + 20 lbs/round) x 5 for time</td>
</tr>
<tr>
<td>3</td>
<td>M G W</td>
<td>Run 400m/10 pull-ups/thruster 50% of bodyweight (BW) x 15 for 20 min for rotations</td>
</tr>
<tr>
<td>4</td>
<td>G</td>
<td>Practice handstands for 45 minutes</td>
</tr>
<tr>
<td>5</td>
<td>W M</td>
<td>(Bench press 75% BW x 10/Row 500m) x 5 for time</td>
</tr>
<tr>
<td>6</td>
<td>G W M</td>
<td>Lunges 100ft./push press 50% BW x 15/row 500m for 20 min for rotations</td>
</tr>
<tr>
<td>7</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>Deadlift 5-3-3-2-2-1-1-1</td>
</tr>
<tr>
<td>9</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>M G</td>
<td>(Run 200m/box jump 30 in x 10) x 5 for time</td>
</tr>
<tr>
<td>11</td>
<td>W M</td>
<td>Clean 50% BW x 20/bike 1 mile/15 push-ups for 20 min for rotations</td>
</tr>
<tr>
<td>12</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

“No successful strength and conditioning program has anywhere ever been derived from scientific principles. Those claiming efficacy or legitimacy on the basis of theories they’ve either invented or corralled to explain their programming are guilty of fraud. Programming derives from clinical practice and can only be justified or legitimized by the results of that practice.”

-Coach Glassman

Element workouts are crushing in their impact and unrivaled in bodily response. The information garnered through your feedback on the WOD has given CrossFit an advantage in estimating and evaluating the effect of workouts that may have taken decades or been impossible without the Internet.

Typically our most effective workouts, like art, are remarkable in composition, symmetry, balance, theme, and character. There is a “choreography” of exertion that draws from a working knowledge of physiological response, a well-developed sense of the limits of human performance, the use of effective elements, experimentation, and even luck. Our hope is that this model will aid in learning this art.

The template encourages new skill development, generates unique stressors, crosses modes, incorporates quality movements, and hits all three metabolic pathways. It does this within a framework of sets and reps and a cast of exercises that CrossFit has repeatedly tested and proven effective. We contend that this template does a reasonable job of formally expressing many CrossFit objectives and values.

60 of 136
“The Girls” for Grandmas

Originally published in October 2004

In September 2003, we introduced six benchmark workouts to test performance and improvements through repeated, irregular appearances. These workouts were given the names: Angie, Barbara, Chelsea, Diane, Elizabeth, and Fran.

These six workouts are as good as any to demonstrate our concept of scalability. Here we offer versions of those workouts that have been “tuned down” in intensity and had exercises substituted to accommodate any audience, particularly the elderly, beginner, or deconditioned athlete.

With scaling, the intent is to preserve the stimulus: adhere to as many of the original workout factors as possible relative to the individual’s physical and psychological tolerances.

<table>
<thead>
<tr>
<th>“Angie”</th>
<th>“Barbara”</th>
<th>“Chelsea”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original</strong></td>
<td><strong>Scaled</strong></td>
<td><strong>Scaled</strong></td>
</tr>
<tr>
<td>For time:</td>
<td>For time:</td>
<td>For time:</td>
</tr>
<tr>
<td>100 pull-ups</td>
<td>25 ring rows</td>
<td>5 ring rows</td>
</tr>
<tr>
<td>100 push-ups</td>
<td>25 push-ups off the knees</td>
<td>10 push-ups off the knees</td>
</tr>
<tr>
<td>100 sit-ups</td>
<td>25 sit-ups</td>
<td>15 squats</td>
</tr>
<tr>
<td>100 squats</td>
<td>25 squats</td>
<td>Each minute on the minute for 30 minutes</td>
</tr>
</tbody>
</table>

Ring Rows

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V3.0_20160104KW
Push-ups off the Knees

Sit-ups

Squats
“Diane”

**Original**
For time:
21-15-9 reps
deadlift 225 lb.
handstand push-ups

**Scaled**
For time:
21-15-9 reps
deadlift 50 lb.
dumbbell shoulder press 10 lb.

“Elizabeth”

**Original**
For time:
21-15-9 reps
clean 135 lb.
ring dips

**Scaled**
For time:
21-15-9 reps
clean 25 lb.
bench dips

Dumbbell Shoulder Press

![Dumbbell Shoulder Press](image)

Clean

![Clean](image)
“Fran”

<table>
<thead>
<tr>
<th>Original</th>
<th>Scaled</th>
</tr>
</thead>
<tbody>
<tr>
<td>For time: 21-15-9 reps thruster 95 lb. pull-ups</td>
<td>For time: 21-15-9 reps thruster 25 lb. ring rows</td>
</tr>
</tbody>
</table>

Bench Dips
Anatomy and Physiology for Jocks

Originally published in August 2003

Effective coaching requires efficient communication. This communication is greatly aided by coach and athlete sharing a terminology for both human movement and body parts.

We have developed an exceedingly simple lesson in anatomy and physiology that we believe has improved our ability to accurately and precisely motivate desired behaviors and enhanced our athletes’ understanding of both movement and posture.

Basically, we ask that our athletes learn four body parts, three joints (not including the spine), and two general directions for joint movement. We cap our Anatomy & Physiology lesson with the essence of sports biomechanics distilled to three simple rules.

We use a simple iconography to depict the spine, pelvis, femur, and tibia. We show that the spine has a normal “S” shape and where it is on the athlete’s body. We similarly demonstrate the pelvis, femur, and tibia.

We next demonstrate the motion of three joints. First, the knee is the joint connecting tibia and femur. Second, working our way up, is the hip. The hip is the joint that connects the femur to the pelvis. Third, is the sacroiliac joint (SI joint), which connects the pelvis to the spine. (We additionally make the point that the spine is really a whole bunch of joints.)
We explain that the femur and tibia constitute “the leg” and that the pelvis and spine constitute “the trunk.”

That completes our anatomy lesson—now for the physiology. We demonstrate that “flexion” is reducing the angle of a joint and that “extension” is increasing the angle of a joint.

Before covering our distillation of essential biomechanics, we test our students to see if everyone can flex and extend their knee (or “leg”), hip, spine, and sacroiliac joint (or “trunk”) on cue. When it is clear that the difference between flexion and extension is understood at each joint, we cue for combinations of behaviors, for instance, “flex one leg and trunk but not your hip.”
Once the joints, parts, and movements are clear we offer these three tidbits of biomechanics:

- Functional movement generally weds the spine to the pelvis. The SI joint and spine were designed for small-range movement in multiple directions. Endeavor to keep the trunk tight and solid for running, jumping, squatting, throwing, cycling, etc.

- The dynamics of those movements comes from the hip—primarily extension. Powerful hip extension is certainly necessary and nearly sufficient for elite athletic capacity.

- Do not let the pelvis chase the femur instead of the spine. We refer to this as “muted hip function”: the pelvis chases the femur. The hip angle remains open and is consequently powerless to extend.

Four parts, three joints, two motions, and three rules give our athletes and us a simple but powerful lexicon and understanding whose immediate effect is to render our athletes at once more “coachable.” We could not ask for more.
The squat is essential to your well-being. The squat can both greatly improve your athleticism and keep your hips, back, and knees sound and functioning in your senior years.

Not only is the squat not detrimental to the knees, it is remarkably rehabilitative of cranky, damaged, or delicate knees. In fact, if you do not squat, your knees are not healthy regardless of how free of pain or discomfort you are. This is equally true of the hips and back.

The squat is no more an invention of a coach or trainer than is the hiccup or sneeze. It is a vital, natural, functional, component of your being.

The squat, in the bottom position, is nature’s intended sitting posture (chairs are not part of your biological make-up), and the rise from the bottom to the stand.
is the biomechanically sound method by which we stand up. There is nothing contrived or artificial about this movement.

Most of the world’s inhabitants sit not on chairs but in a squat. Meals, ceremonies, conversation, gatherings, and defecation are all performed bereft of chairs or seats. Only in the industrialized world do we find the need for chairs, couches, benches, and stools. This comes at a loss of functionality that contributes immensely to decrepitude.

Frequently, we encounter individuals whose doctor or chiropractor has told them not to squat. In nearly every instance this is pure ignorance on the part of the practitioner. When a doctor that does not like the squat is asked, “By what method should your patient get off of the toilet?” they are at a loss for words.

In a similarly misinformed manner we have heard trainers and health care providers suggest that the knee should not be bent past 90 degrees. It is entertaining to ask proponents of this view to sit on the ground with their legs out in front of them and then to stand without bending the legs more than 90 degrees. It cannot be done without some grotesque bit of contrived movement. The truth is that getting up off of the floor involves a force on at least one knee that is substantially greater than the squat.

Our presumption is that those who counsel against the squat are either just repeating nonsense they have heard in the media or at the gym, or in their clinical practice they have encountered people who have injured themselves squatting incorrectly.

It is entirely possible to injure yourself squatting incorrectly, but it is also exceedingly easy to bring the squat to a level of safety matched by walking.

On the athletic front, the squat is the quintessential hip extension exercise, and hip extension is the foundation of all good human movement. Powerful, controlled hip extension is necessary and nearly sufficient for elite athleticism. “Necessary” in that without powerful, controlled hip extension you are not functioning anywhere near your potential. “Sufficient” in the sense that

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### How to Squat

Here are some valuable cues to a sound squat. Many encourage identical behaviors.

1. Start with the feet about shoulder width apart and slightly toed out.
2. Keep your head up looking slightly above parallel.
3. Do not look down at all; ground is in peripheral vision only.
4. Accentuate the normal arch of the lumbar curve and then pull the excess arch out with the abs.
5. Keep the midsection very tight.
6. Send your butt back and down.
7. Your knees track over the line of the foot.
8. Do not let the knees roll inside the foot. Keep as much pressure on the heels as possible.
9. Stay off of the balls of the feet.
10. Delay the knees’ forward travel as much as possible.
11. Lift your arms out and up as you descend.
12. Keep your torso elongated.
13. Send hands as far away from your butt as possible.
14. In profile, the ear does not move forward during the squat, it travels straight down.
15. Do not let the squat just sink, but pull yourself down with your hip flexors.
16. Do not let the lumbar curve surrender as you settle in to the bottom.
17. Stop when the fold of the hip is below the knees—break parallel with the thigh.
18. Squeeze glutes and hamstrings and rise without any leaning forward or shifting of balance.
19. Return on the exact same path as you descended.
20. Use every bit of musculature you can; there is no part of the body uninvolved.
21. On rising, without moving the feet, exert pressure to the outside of your feet as though you were trying to separate the ground beneath you.
22. At the top of the stroke, stand as tall as you possibly can.
everyone we have met with the capacity to explosively open the hip could also run, jump, throw, and punch with impressive force.

Secondarily, but no less important, the squat is among those exercises eliciting a potent neuroendocrine response. This benefit is ample reason for an exercise’s inclusion in your regimen.

The Air Squat
All our athletes begin their squatting with the “air squat,” that is, without any weight other than body-weight. As a matter of terminology, when we refer to the “squat” we are talking about an unladen, body-weight only squat. When we wish to refer to a weighted squat we will use the term back squat, overhead squat, or front squat, referring to those distinct weighted squats. The safety and efficacy of training with the front, back, and overhead squats before the weightless variant has been mastered retards athletic potential.

When has the squat been mastered? This is a good question. It is fair to say that the squat is mastered when both technique and performance are superior. This suggests that none of the points of performance are deficient and fast multiple reps are possible. Our favorite standard for fast multiple reps would be the Tabata squat (20 seconds on/10 seconds off repeated 8 times) with the weakest of eight intervals being between 18-20 reps. Do not misunderstand—we are looking for 18-20 perfect squats in 20 seconds, rest for 10 and repeat seven more times for a total of eight intervals.

The most common faults to look for are surrendering of the lumbar curve at the bottom, not breaking the parallel plane with the hips, slouching in the chest and shoulders, lifting the heels, and not fully extending the hip at the top. Do not even think about weighted squats until none of these faults belong to you.

A relatively small angle of hip extension, while indicative of a beginner’s or weak squat and caused by weak hips extensors, is not strictly considered a fault as long as the lumbar spine is neutral.
Causes Of A Bad Squat

1. Weak glute/hamstring. The glutes and hams are responsible for powerful hip extension, which is the key to the athletic performance universe.

2. Poor engagement, weak control, and no awareness of glute and hamstring. The road to powerful, effective hip extension is a three to five year odyssey for most athletes.

3. Resulting attempt to squat with quads. Leg extension dominance over hip extension is a leading obstacle to elite performance in athletes.

4. Inflexibility. Tight hamstrings are a powerful contributor to slipping into lumbar flexion—the worst fault of all.

5. Sloppy work, poor focus. This is not going to come out right by accident. It takes incredible effort. The more you work on the squat, the more awareness you develop as to its complexity.

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Figure 1. Common Faults or Anatomy of a Bad Squat.

- Not breaking the parallel plane
- Rolling knees inside feet
- Dropping head
- Losing lumbar extension (rounding the back—this may be the worst)
- Dropping the shoulders
- Heels off the ground
- Not finishing the squat—not completing hip extension
Therapies For Common Faults

Bar Holds: Grab a bar racked higher and closer than your normal reach at bottom of squat, then settle into perfect bottom with chest, head, hands, arms, shoulders, and back higher than usual. Find balance, let go, repeat closer and higher, etc. This lifts the squat (raises head, chest, shoulders, and torso) putting more load on heels and glute/hams. This immediately forces a solid bottom posture from which you have the opportunity to feel the forces required to balance in good posture. This is a reasonable shoulder stretch but not as good as the overhead squat.

Figure 2. Bar Hold Squat Therapy.

Box Squatting: Squat to a 10 inch box, rest at bottom without altering posture, then squeeze and rise without rocking forward. Keep perfect posture at bottom. This is a classic bit of technology perfected at the Westside Barbell Club.

Bottom-to-Bottoms: Stay at the bottom and come up to full extension and quickly return to bottom spending much more time at bottom than top. For instance sitting in the bottom for five minutes coming up to full extension only once every five seconds, i.e. 60 reps. Many will avoid

Figure 3. Bottom-to-Bottoms Squat Therapy.
the bottom like the plague. You want to get down there, stay down there, and learn to like it.

**Overhead Squats:** Hold broom stick at snatch grip width directly overhead, arms locked. The triangle formed by arms and stick must stay perfectly perpendicular to the ground as you squat. This is a good shoulder stretch and lifts the squat. With weight, this exercise demands good balance and posture or loads become wildly unmanageable. The overhead squat is a quick punisher of sloppy technique. If shoulders are too tight this movement will give an instant diagnosis. You can move into a doorway and find where the arms fall and cause the stick to bang into doorway. Lift the arms, head, chest, back, and hip enough to travel up and down without hitting the doorway. Over time, work to move feet closer and closer to doorway without hitting. The broomstick foundation is critical to learning the snatch—the world’s fastest lift.

![Figure 4. Overhead Squat Therapy.](image)

### Table 1. Squat Troubleshooting: Common Faults and Therapies

<table>
<thead>
<tr>
<th>Faults</th>
<th>Causes</th>
<th>Therapies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not going to parallel (not deep enough)</td>
<td>Weak hip extensors, laziness, quad dominance</td>
<td>Bottom to bottoms, Bar holds, Box squatting</td>
</tr>
<tr>
<td>Rolling knees inside feet</td>
<td>Weak adductors, cheat to quads</td>
<td>Push feet to outside of shoe, deliberately adduct (attempt to stretch floor apart beneath feet)</td>
</tr>
<tr>
<td>Dropping head</td>
<td>Lack of focus, weak upper back, lack of upper back control</td>
<td>Bar holds, overhead squats</td>
</tr>
<tr>
<td>Losing lumbar extension</td>
<td>Lack of focus, tight hamstrings, cheat for balance due to weak glute/hams</td>
<td>Bar holds, overhead squats</td>
</tr>
<tr>
<td>Dropping shoulders</td>
<td>Lack of focus, weak upper back, lack of upper back control, tight shoulders</td>
<td>Bar holds, overhead squats</td>
</tr>
<tr>
<td>Heels off ground</td>
<td>Cheat for balance due to weak glute/hams</td>
<td>Focus, Bar holds</td>
</tr>
</tbody>
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**Air Squat**
- Maintain the arch in the back
- Look straight ahead
- Keep weight on heels
- Reach the full range of motion (i.e., below parallel)
- Keep the chest high
- Keep the midsection tight

The squat is essential to human movement, a proven performance enhancer and a gateway movement to the best exercise in strength and conditioning.

**Front Squat**
- Bar rests on chest and shoulders with loose grip—“racked”
- The mechanics are otherwise like the air squat

The hardest part of the front squat may be the rack position. Practice until you can get the bar and hands in the proper position. Handstands help. This one will force shoulder and wrist flexibility.
The overhead squat is the ultimate core exercise, the heart of the snatch, and peerless in developing effective athletic movement.

This functional gem trains for efficient transfer of energy from large to small body parts—the essence of sport movement. For this reason it is an indispensable tool for developing speed and power.

The overhead squat also demands and develops functional flexibility, and similarly develops the squat by amplifying and cruelly punishing faults in squat posture, movement, and stability.

The overhead squat is to midline control, stability, and balance what the clean and snatch are to power—unsurpassed.

Ironically, the overhead squat is exceedingly simple yet universally nettlesome for beginners. There are three common obstacles to learning the overhead squat. The first is the scarcity of skilled instruction—outside of the weightlifting community most instruction on the overhead squat is laughably horribly, wrong—dead wrong. The second is a weak squat—you need to have a rock-solid squat to learn the overhead squat. The third obstacle is starting with too much weight—you have not a snowball’s chance in hell of learning the overhead squat with a bar. You will need to use a length of dowel or plastic PVC pipe; use anything over five pounds to learn this move and your overhead squat will be stillborn.
Learning The Overhead Squat

1. Start only when you have a strong squat and use a dowel or PVC pipe, not a weight. You should be able to maintain a rock-bottom squat with your back arched, head and eyes forward, and body-weight predominantly on your heels for several minutes as a prerequisite to the overhead squat. Even a 15 lb. training bar is way too heavy to learn the overhead squat.

2. Learn locked-arm “dislocates” or “pass-throughs” with the dowel. You want to be able to move the dowel nearly 360 degrees starting with the dowel down and at arms length in front of your body, and then move it in a wide arc until it comes to rest down and behind you without so much as slightly bending your arms at any point in its travel. Start with a grip wide enough to easily pass through, and then repeatedly bring the hands in closer until passing through presents a moderate stretch of the shoulders. This is your training grip.
3. Be able to perform the pass-through at the top, the bottom, and everywhere in between while descending into the squat. Practice by stopping at several points on the path to the bottom, hold, and gently, slowly, swing the dowel from front to back, again, with locked arms. At the bottom of each squat, slowly bring the dowel back and forth moving from front to back.

4. Learn to find the frontal plane with the dowel from every position in the squat. Practice this with your eyes closed. You want to develop a keen sense of where the frontal plane is located. This is the same drill as step 3 but this time you are bringing the dowel to a stop in the frontal plane and holding briefly with each pass-through. Have a training partner check to see if at each stop the dowel is in the frontal plane.
5. Start the overhead squat by standing tall with the dowel held as high as possible in the frontal plane. You want to start with the dowel directly overhead, not behind you, or, worse yet, even a little bit in front.

6. Very slowly lower to the bottom of the squat, keeping the dowel in the frontal plane the entire time. Have a training partner watch from your side to make sure that the dowel does not move forward or backward as you squat to bottom. Moving slightly behind the frontal plane is acceptable, but forward is dead wrong. If you cannot keep the dowel from coming forward your grip may be too narrow. The dowel will not stay in the frontal plane automatically; you will have to pull it back very deliberately as you descend (particularly if your chest comes forward).
7. Practice the overhead squat regularly and increase load in tiny increments. We can put a 2.5 lb. plate on the dowel, then a 5, then a 5 and a 2.5, and then a 10. Next use a 15 lb. training bar, but only while maintaining perfect form. There is no benefit to adding weight if the dowel, and later the bar, cannot be kept in the frontal plane.

With practice, you will be able to bring your hands closer together and still keep the bar in the frontal plane. Ultimately you can develop enough control and flexibility to descend to a rock bottom squat with your feet together and hands together without the dowel coming forward. Practicing for this is a superb warm-up and cool-down drill and stretch.

The overhead squat develops core control by punishing any forward wobble of the load with an enormous and instant increase in the moment about the hip and back. When the bar is held perfectly overhead and still, which is nearly impossible, the overhead squat does not present greater load on the hip or back, but moving too fast, along the wrong line of action, or wiggling can bring even the lightest loads down like a house of cards. You have two, and only two, safe options for bailing out—dumping the load forward and stepping or falling backward, or dumping backward and stepping or falling forward. Both are safe and easy. Lateral escapes are not an option.

The difference between your overhead squat and your back or front squat is a solid measure of your midline stability and control and the precision of your squatting posture and line of action. Improving and developing your overhead squat will fix faults not visible in the back and front squat.

As your max overhead, back, and front squat each rise, their relative measure reveals much about your developing potential for athletic movement.

An average of your max back and front squat is an excellent measure of your core, hip, and leg strength. Your max overhead squat is an excellent measure of your core stability and control and ultimately your ability to generate effective and efficient athletic power.

Your max overhead squat will always be a fraction of the average of your max back and front squat but, ideally, with time, they should converge rather than diverge.

Should they diverge, you are developing hip and core strength, but your capacity to efficiently apply power distally is reduced. In athletic pursuits you may be prone to injury. Should they converge, you are developing useful strength and power that can be successfully applied to athletic movements.

The functional application or utility of the overhead squat may not be readily apparent, but there are many real-world occurrences where objects high enough to get under are too heavy or not free enough to be jerked or pressed overhead, yet can be elevated by first lowering your hips until your arms can be locked and then squatting upwards.

Once developed, the overhead squat is a thing of beauty—a masterpiece of expression in control, stability, balance, efficient power, and utility. Get on it.
**A:** The torso's angle of inclination above horizontal. As a squat matures, this angle increases. The squat becomes more upright as the athlete's strength and neural "connectedness" to the posterior chain increase. Lower angles of inclination are created in an attempt to cantilever away from a weak posterior chain and onto the quadriceps. While technically correct, the lower angle is mechanically disadvantaged, particularly in loaded variations.

**90-A:** This is the angle of rotation of the arms, at the shoulders, past overhead. The lower A is, the greater the rotation, 90-A, required of the shoulders to keep the bar in the frontal plane. The larger 90-A is, the wider the grip required to allow the shoulders to rotate to keep the bar in the frontal plane. Ultimately, the connectedness/strength of the posterior chain will determine the width of the grip, elevation of the squat, and degree of rotation of the shoulders. Maturity and quality of the squat is a determinant of all of the mechanics of the overhead squat.

**g:** These lines mark horizontal

**f:** This line defines the frontal plane. It divides the athlete's front half from back half. In the squat (as with most weightlifting movements), the athlete endeavors to keep the load in this plane. If a load deviates substantially from this plane the athlete has to bring the load back, which in turn pulls the athlete off balance.

**b:** This is roughly the position for a back or front squat.

**a:** This is the position for the overhead squat. With perfect stability, movement, and alignment, this position does not increase the moment about the hip or back. The difference in an athlete's strength when squatting here, overhead, as opposed to position b, the back or front squat, is a perfect measure of instability in the torso, legs, or shoulders, and improper line of action in the shoulders, hips, or legs, and weak or flawed posture in the squat.

**c:** This position has the load behind the frontal plane. It can actually decrease the moment on the hip and back. As long as balance is maintained, the position is strong.

**d:** This is a fatal flaw in the overhead squat. Even slight movement in this direction greatly increases the moment in the hip and back. Moving in this direction with even a small load can collapse the squat like a house of cards.
The Overhead Squat

- Grip as wide as needed to perform a pass-through and keep the bar in the frontal plane
- Use active shoulders
- The mechanics are otherwise like the air squat

The overhead squat is an important stretch, perfect for warm-ups, integral to the snatch and will expose most functional inflexibility and any mechanical deficiency in your squat.
Shoulder Press, Push Press, Push Jerk

Originally published in January 2003

Learning the progression of lifts that moves from the shoulder press, to the push press, to the push jerk has long been a CrossFit staple. This progression offers the opportunity to acquire some essential motor recruitment patterns found in sport and life (functionality) while greatly improving strength in the “power zone” and upper body. In terms of power zone and functional recruitment patterns, the push press and push jerk have no peer among the other presses like the “king” of upper body lifts, the bench press. As the athlete moves from shoulder press, to push press, to push jerk, the importance of core-to-extremity muscle recruitment is learned and reinforced. This concept alone would justify the practice and training of these lifts. Core to extremity muscular recruitment is foundational to the effective and efficient performance of athletic movement.

The most common errors in punching, jumping, throwing, and a multitude of other athletic movements typically express themselves as a violation of this concept. Because good athletic movement begins at the core and radiates to the extremities, core strength is absolutely essential to athletic success. The region of the body from which these movements emanate, the core, is often referred to as the “power zone.” The muscle groups comprising the “power zone” include the hip flexors, hip extensors (glutes and hams), spinal erectors, and quadriceps.

These lifts are enormous aids to developing the power zone. Additionally, the advanced elements of the progression, the push press and jerk, train for and develop power and speed. Power and speed are “king” in sport performance. Coupling force with velocity is the very essence of power and speed. Some of our favorite and most developmental lifts lack this quality. The push press and jerk are performed explosively—that is the hallmark of speed and power training. Finally, mastering this progression gives ideal opportunity to detect and eliminate a postural/mechanical fault that plagues more athletes than not—the pelvis “chasing” the leg during hip flexion. This fault needs to be searched out and destroyed. The push press performed under great stress is the perfect tool to conjure up this performance wrecker so it can be eliminated.
**Shoulder Press**
- Set-up: Take bar from supports or clean to racked position. The bar sits on the shoulders with the grip slightly wider than shoulder width. The elbows are below and in front of bar. Stance is approximately hip width.
- Press: Press the bar to a position directly overhead. Head must accommodate the bar.

**Push Press**
- Set-up: The set-up is the same as the shoulder press.
- Dip: Initiate the dip by bending the hips and knees while keeping the torso upright. The dip will be only a couple of inches.
- Drive: With no pause at the bottom of the dip, the hips and legs are forcefully extended.
- Press: As the hips and legs complete extension, the shoulders and arms forcefully press the bar overhead until the arms are fully extended.
Push Jerk

- Set-up: The set-up is the same as for the shoulder press and push press.

- Dip: The dip is identical to the push press

- Drive: The drive is identical to the push press

- Press under: This time instead of just pressing, you press and dip a second time simultaneously, catching the bar in a partial squat with the arms fully extended overhead.

- Finish: Stand to fully erect with bar directly overhead, identical to terminal position in push press and shoulder press.

The muted hip, where the pelvis chases the femur, in the dip phase.
The Role Of The Abs In The Overhead Lifts
Athletically, the abdominals’ primary role is midline stabilization, not trunk flexion. They are critical to swimming, running, cycling, and jumping, but never is their stabilizing role more critical than when attempting to drive loads overhead, and, of course, the heavier the load, the more critical the abs’ role becomes. We train our athletes to think of every exercise as an ab exercise but in the overhead lifts it is absolutely essential to do so. It is easy to see when an athlete is not sufficiently engaging the abs in an overhead press—the body arches so as to push the hips, pelvis, and stomach ahead of the bar. Constant vigilance is required of every lifter to prevent and correct this postural deformation.

Summary
From shoulder press to push jerk the movements become increasingly more athletic, functional, and suited to heavier loads. The progression also increasingly relies on the power zone. In the shoulder press, the power zone is used for stabilization only. In the push press the power zone provides not only stability, but also the primary impetus in both the dip and drive. In the push jerk the power zone is called on for the dip, drive, second dip, and squat. The role of the hip is increased in each exercise.

With the push press you will be able to drive overhead as much as 30 percent more weight than with the shoulder press. The push jerk will allow you to drive as much as 30 percent more overhead than you would with the push press.

In effect the hip is increasingly recruited through the progression of lifts to assist the arms and shoulders in raising loads overhead. After mastering the push jerk you will find that it will unconsciously displace the push press as your method of choice when going overhead.

The second dip on the push jerk will become lower and lower as you both master the technique and increase the load. At some point in your development, the loads will become so substantial that the upper body cannot contribute but a fraction to the movement at which point the catch becomes very low and an increasing amount of the lift is accomplished by the overhead squat.

On both the push press and jerk the “dip” is critical to the entire movement. The stomach is held very tightly and the resultant turn around from dip to drive is sudden, explosive, and violent.

Try This
Start with 95 lb. and push press or push jerk 15 straight repetitions, rest 30 seconds, and repeat for total of five sets of 15 repetitions each. Go up in weight only when you can complete all five sets with only 30 seconds rest between each and do not pause in any set.

Repetition one: shoulder press, repetition two: push press, repetition three: push jerk. Repeat until shoulder press is impossible then continue until push press is impossible then five more push jerks. Start with 95 lb. and go up only when the total repetitions exceed 30.
The deadlift is unrivaled in its simplicity and impact while unique in its capacity for increasing head to toe strength. Regardless of whether your fitness goals are to “rev up” your metabolism, increase strength or lean body mass, decrease body fat, rehabilitate your back, improve athletic performance, or maintain functional independence as a senior, the deadlift is a marked shortcut to that end.

To the detriment of millions, the deadlift is infrequently used and seldom seen either by most of the exercising public and/or, believe it or not, by athletes.

It might be that the deadlift’s name has scared away the masses; its older name, “the healthlift,” was a better choice for this perfect movement.

In its most advanced application the deadlift is prerequisite to, and a component of, “the world’s fastest lift,” the snatch, and “the world’s most powerful lift,” the clean; but it is also, quite simply, no more than the safe and sound approach by which any object should be lifted from the ground.

The deadlift, being no more than picking a thing off the ground, keeps company with standing, running, jumping, and throwing for functionality but imparts quick and prominent athletic advantage like no other exercise. Not until the clean, snatch, and squat are well developed will the athlete again find as useful a tool for improving general physical ability.

The deadlift’s primal functionality, whole-body nature, and mechanical advantage with large loads suggest its strong neuroendocrine impact, and for most athletes the deadlift delivers such a quick boost in general strength and sense of power that its benefits are easily understood.

If you want to get stronger, improve your deadlift. Driving your deadlift up can nudge your other lifts upward, especially the Olympic lifts.

Fear of the deadlift abounds, but like fear of the squat, it is groundless. No exercise or regimen will protect the back from the potential injuries of sport and life or the certain ravages of time like the deadlift (See the inset “Doc & Coach”).

We recommend deadlifting at near max loads once per week or so and maybe one other time at loads that would be insignificant at low reps. Be patient and learn to celebrate small infrequent bests.

Major benchmarks would certainly include body-weight, twice body-weight, and three times body-weight deadlifts representing “beginning,” “good,” and “great” deadlifts respectively.

For us, the guiding principles of proper technique rest on three pillars: orthopedic safety, functionality, and mechanical advantage. Concerns for orthopedic stresses and limited functionality are behind our rejection of wider than hip to shoulder width stances. While acknowledging the remarkable achievements of many powerlifters with the super wide deadlift stance we feel that its limited functionality (we cannot safely, walk, clean, or snatch from “out there”) and the increased resultant forces on the hip from wider stances warrant only infrequent and moderate to light exposures to wider stances.
Experiment and work regularly with alternate, parallel, and hook grips. Explore carefully and cautiously variances in stance, grip width, and even plate diameter—each variant uniquely stresses the margins of an all-important functional movement. This is an effective path to increased hip capacity.

Consider each of the following cues to a sound deadlift. Many motivate identical behaviors, yet each of us responds differently to different cues.

- Natural stance with feet under hips
- Symmetrical grip whether parallel, hook, or alternate
- Hands placed where arms will not interfere with legs while pulling from the ground
- Bar above juncture of little toe and foot
- Shoulders slightly forward of bar
- Inside of elbows facing one another
- Chest up and inflated
- Abs tight
- Arms locked and not pulling

The deadlift.
• Shoulders pinned back and down
• Lats and triceps contracted and pressing against one another
• Keep your weight on your heels
• Bar stays close to legs and essentially travels straight up and down
• Torso’s angle of inclination remains constant while bar is below the knee
• Head straight ahead
• Shoulders and hips rise at same rate when bar is below the knee
• Arms remain perpendicular to ground until lockout
Doc and Coach

(Transcript of actual conversation)

Doc: Many of my patients shouldn’t be doing the deadlift.
Coach: Which ones are those, Doc?
Doc: Many are elderly, marginally ambulatory, and frail/feeble and osteoporotic.
Coach: Doc, would you let such a patient, let’s say an old woman, walk to the store to get cat food?
Doc: Sure, if the walk weren’t too far, I’d endorse it.
Coach: All right, suppose after walking home she came up to the front door and realized that her keys were in her pocket. Is she medically cleared to set the bag down, get her keys out of her pocket, unlock the door, pick the bag back up, and go in?
Doc: Of course, that’s essential activity.
Coach: As I see it, the only difference between us is that I want to show her how to do this “essential activity” safely and soundly and you don’t.
Doc: I see where you’re going. Good point.
Coach: Doc, we haven’t scratched the surface.

Deadlift

- Look straight ahead
- Keep the back arched
- Arms do not pull, they are just straps
- Bar travels along legs
- Push through the heels
- The deadlift, like the squat, is essential functional movement and carries a potent hormonal punch. This is core training like no other.
Sumo Deadlift High Pull

- Start on ground
- Wide, “sumo” stance
- Take narrow grip on bar
- Look straight ahead
- Keep back arched
- Pull with hips and legs only until both are at full extension
- Aggressively open hip fully
- Powerfully shrug
- Immediately pull with arms continuing the upward travel of the bar
- Keep the elbows as far above your hands as possible
- Bring the bar right up under the chin briefly
- Lower to hang
- Lower to ground

For range of motion, line of action, and length and speed of action, the sumo deadlift high pull is a great conjugate to the thruster. At low loads this is our favorite substitute for Concept2 rowing.
The clean and jerk and the snatch, the Olympic lifts, present the toughest learning challenge in all of weight training. Absent these lifts, there are no complex movements found in the weight room. By contrast, the average collegiate gymnast has learned hundreds of movements at least as complex, difficult, and nuanced as the clean or snatch. In large part because most weight training is exceedingly simple, learning the Olympic lifts is for too many athletes a shock of frustration and incompetence.

Sadly, many coaches, trainers, and athletes have avoided these movements precisely because of their technical complexity. Ironically, but not surprisingly, the technical complexity of the quick lifts exactly contain the seeds of their worth. That is, they simultaneously demand and develop strength, power, speed, flexibility, coordination, agility, balance, and accuracy.

When examining the reasons offered for not teaching the Olympic lifts we cannot help but suspect that the lifts' detractors have no first hand (real) experience with them. We want to see someone, anyone, do a technically sound clean or snatch at any weight and then offer a rationale for the movement’s restricted applicability. Were they dangerous or inappropriate for any particular population, we would find coaches intimate with the lifts articulating the nature of their inappropriateness. We do not.
At CrossFit, everyone learns the Olympic lifts—right, everyone.

We review here the bad rap hung on the Olympic lifts because we have made exciting progress working past the common misconceptions and fears surrounding their introduction, execution, and applicability to general populations. The medicine-ball clean has been integral to our successes.

The Dynamax medicine ball is a soft, large, pillowy ball that ranges in weight from four to 28 lb, available in two-lb. increments to 20 lb. It is nonthreatening, even friendly.

Working with Dynamax balls we introduce the starting position and posture of the deadlift, then the lift itself. In a matter of minutes we then shift our efforts to front squatting with the ball. After a little practice with the squat we move to the clean. (A similar approach is used to teach the shoulder press, push press, and push jerk.)
Medicine-Ball Clean and Jerk: Common Faults and Corrections

- No shrug
- Curling the ball
- Arms bent
- Pulling too high
- No hip extension
- No shrug
- Curling the ball

Corrected starting position: heels down, head up, back arched
Common Faults and Corrections, (cont’d)

Correction:
Catch with elbows high

Corrections:
Arms locked, full extension, shrug, not pulling too high, ball kept close to body

Low slow elbows in catch

Correction:
Catch with elbows high

Arms bent overhead

Arms not overhead

Corrected overhead position
The clean is then reduced to “pop the hip and drop–catch it in a squat” and it is done. The devil is in the details, but the group is cleaning in five minutes. It is a legitimate, functional clean. This clean may in fact have clearer application, than cleaning with a bar, to heaving a bag of cement into a pick-up or hucking up a toddler to put in a car seat.

The faults universal to lifting initiates are all there in as plain sight with the ball as with the bar. Any subtleties of matured and modern bar technique not possible with the ball are not immediate concerns, and their absence is plainly justified by the imparted understanding that this is functional stuff and applicable to all objects we may desire to heave from ground to chest.

In a group of mixed capacities the newbies get the light balls and the veterans get the heavy ones. In 30 rep doses whoever ends up with the 28 lb. ball is going to get a workout regardless of his or her abilities. The heavier balls impart a nasty wallop far beyond the same work done with a bar or dumbbell of equal weight; considerable additional effort is expended adducting the arms, which is required to “pinch” the ball and keep it from slipping.

We use the medicine-ball clean in warm-ups and cool-downs to reinforce the movement and the results are clearly manifest in the number and rate of personal records we are seeing in bar cleans with all our athletes. Yes, the benefit transfers to the bar–even for our better lifters!

Where this becomes “dangerous,” “bad for the joints,” “too technical to learn,” or any other nonsense routinely uttered about weightlifting, we do not know.

We review here the bad rap hung on the Olympic lifts because we have made exciting progress working past the common misconceptions and fears surrounding their introduction, execution, and applicability to general populations. The medicine-ball clean has been integral to our successes.
Our definition of core strength is midline stabilization. In profile, there is a reference line that trisects the spine and bisects the pelvis. Midline stabilization is the ability to maintain rigidity, stability and a lack of deflection about that line (Figure 1). This translates to improved efficiency and performance and greater power output.

It is critical to the deadlift, to the laden squat, to the shoulder press and to any sport. In a swimmer’s stroke—when the left leg kicks and right arm pulls—if the torso deviates to one side, you lose energy. Energy is lost in its deflection, whether throwing a punch, riding a bicycle or squatting. The abdominals, with the hip flexors, control one side of the torso, with the hip extensors and erectors involved on the other side.

However, what we have in modern physical culture is an excessive awareness and focus on the anterior and not on the posterior. As a culture of athletes and non-athletes alike, we are unfortunately frontally fixated. Pecs—what about the rhomboids? Abs—what about the erectors? Quads—what about the glute-hamstring? And for the best of functional movement—punch, jump, throw, run—the impetus comes out of the posterior.

We see communities where there is a very deliberate and concerted effort to minimize hip-flexor involvement in exercise. And yet, by insertion and origin, by mechanical position and advantage, and just kinematically, the hip flexors have several times the contraction capacity that is estimated of the abdominals. All of it: hip extensors, hip flexors, trunk flexors and extensors are essential to midline stabilization. The abdominals are just one part of the story.

For core strength (midline stabilization), we are talking about static control. We do not want this relationship of spine to pelvis deflecting. Nevertheless, a lot of the commonly used “core” movements involve dynamic movements: the crunch is a very deliberate flexion of the trunk. Conversely, when we deadlift, we very deliberately hold that relationship static.

What is amazing is how many communities that are regularly involved in physical training (PT) have 1) almost no effort focused on hip extension and 2) almost no awareness of the spine-to-pelvis relationship. About the only thing that we see them paying attention to is dynamic trunk-flexion work. There is no trunk-extension work, no hip-extension work, and hip flexion is deliberately limited. Some of these communities also have problems with chronic back injury, which comes at no surprise. If there is anything to “muscle balance,” it makes sense. In how many communities are they doing an equal number of deadlifts and squats to their sit-ups? Most of the military/law-enforcement PT is completely devoid of full-range-of-motion hip extension. Rucking, running, jumping jack—all will not do it. The run, pull-up, sit-up, push-up, lather-rinse-
repeat PT have no real good core movement. The crunch does not count.

While a cumbersome and space-taking piece of gear, the GHD has been essential to our work. We have four of them in 2,500 square feet, so one every 600 feet. We use the GHD for four exercises to heighten awareness and develop capacity at midline stabilization. The punch line to the story is that static contractions that stabilize the midsection are the most important and functional (powerful) muscular contractions in that region. Static contractions for midline stabilization are the best ab exercises known. There is no amount of crunches that are ever going to get you to the same end point as the L-sit, overhead squat, deadlift, etc.

What we suspect is that if you could sequentially fire the abs with the same force in any kind of dynamic pattern, you would have the ability to seriously injure your spine. If you could ever crunch with the same force that you can stabilize, you would be able to break your back at will. We have come hardwired unable to do that— that is my guess.

The movements are presented in the order in which they should be developed in a client. The first thing is a simple hip extension: articulate at the hip only, maintaining this distance from xiphoid process to pubic bone. There is no shortening of the trunk. There is no trunk flexion, just hip extension and flexion while maintaining midline stabilization. The erectors are being used statically, and the primary movers here are glutes and hamstrings working concentrically and eccentrically. Be careful such that the client’s femur is on the pad and the pelvis is free. If the pelvis is trapped, the athlete will not be able to hold the lumbar curve. The hip extension is static in the trunk and dynamic in the hip (Figures 2 and 3).

Not only is this movement exceedingly safe, it is also incredibly rehabilitative of the lower back. Even people with near-acute lower-back injury can do this, but ensure there is no flexion in the torso. With the capacity to do 25-30 consecutive repetitions without momentum, they will find there is substantial mitigation in whatever was bothering them. This is a milder stimulus to that region than a moderate-weight deadlift. An air squat and an insignificant-load deadlift combined with this movement create a great launching point. It is a critical part of our beginning efforts with our clients regardless of age.

Once a client has shown some competence here (25-30 consecutive reps), the next movement is the back extension. The pad has to be adjusted such that it is under the pelvis. In this movement, the athlete deliberately surrenders the lumbar curve, thereby engaging in trunk flexion and extension. The erectors are now working dynamically, with the glute and hamstring working statically or isometrically. We are doing it controlled—not bouncing, not flopping. We are doing it initially unladen (Figure 4).

Figure 2. Trainers Can Provide Assistance for Hip Extensions Until Capacity is Developed.

When there is proven capacity in the back extension (25-30 consecutive reps), we move on to the hip-and-back extension. The pad is adjusted back to the setting used for hip extension. Starting from the bottom, extended in the spine, full flexion in the hip, the pelvis first lifts followed by a wave of contraction from lumbar all the way to the cervical, finishing with a rhomboid pull back at the top. The initial movement comes out of a powerful, dynamic glute-hamstring movement that extends the hip. Then the back extends sequentially along the spine from “south to north” (Figure 5).

This movement does a lot for a coach. It heightens a neurological awareness. It allows me to introduce some essential vernacular to the client. If we do not have cues
that allow me to talk about hip flexion, trunk flexion, hip extension, trunk flexion extension, I am fairly worthless with a client. Very early, get clients to know terms. Be able to call it out and get the response you need.

This movement demonstrates tremendous control. There is hip flexion, hip extension, trunk flexion and trunk extension in a combo “snake” move. Using those muscles is essential for midline stabilization and working the posterior.

“Midline stability, control of the major body axis, is a CrossFit constant.”

- Coach Glassman

The fourth movement on the GHD is a sit-up but involves no trunk flexion. For the GHD sit-up, the pad is set so the pelvis is free, and the athlete descends back to touch the ground and then comes back to seated. More than a few exercise physiologists and certified trainers have observed that this movement is pure hip flexion and consequently asserted “there’s no abs in that.”

But what the abs are doing in this exercise is midline stabilization.

Before having a client perform the GHD sit-up, ensure they have demonstrated capacity in the hip extension, back extension, and hip-and-back extension. Even still, their first GHD sit-ups should be performed in a shortened range of motion, with the trainer spotting behind them (Figure 6). That might be it for the first dose. Once they come back and you can determine the effect from that dose, increase the range of motion and volume as their capacity allows.

To perform a GHD sit-up, there is some leg flexion in the descent. Then, the leg extends dramatically and pulls the
athlete to seated (Figure 7). Conversely, if the athlete does not extend the leg to come to seated, the primary movers are the hip flexors, but specifically the psoas.

The psoas comes off the femur, runs through the pelvis (without attachment) and attaches to the lumbar spine. The hip flexors are also comprised of a very powerful complement to the psoas: the rectus femoris, which is the dominant piece of the quadriceps. The rectus femoris does not attach to the lumbar spine, but it attaches to the pelvis. This attachment to the pelvis is a point of enormous mechanical advantage and leverage. And to fully engage that, the leg must extend dramatically. The leg cannot sharply extend without working rectus femoris—a leg extensor and a hip flexor.

The force with which an athlete comes up is amazing. Rather than being pulled from the psoas alone, which is a fairly dysfunctional kind of pull, the athlete uses the full complement of hip-flexor musculature. Any time you are

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Figure 4. GHD Back Extension.
Figure 5. GHD Hip-and-Back Extension.
using a fraction of the primary movers responsible for that articulation, it is not natural, not functional and contrary to nature. Not extending the leg can also be a little irritating to the low back due to this shearing force on the lumbar spine. Performed correctly, the movement is not irritating to the low back. Straightening that leg enables profound musculature to lift from the pelvis.

Figure 6. Trainers Should Initially Spot Clients and Shorten the Range of Motion in the GHD Sit-up.
The Glute-Ham Developer (GHD), continued

![GHD Sit-up](image)

**Figure 7. GHD Sit-up.**
The Glute-Ham Developer (GHD), continued

Figure 8. AbMat Sit-up.
There are people that have this irritation in the spine from a shear force. If you can teach them to extend the legs to work the full complement of hip flexors, we will move the margins where this irritation occurs from 3 reps, to 4 reps, to 10 reps and so on. That is rehabilitation. That is neuromuscular re-education.

There an adjunct movement to GHD sit-up in which the athlete is dynamic in the trunk and static in the hip. It is the AbMat sit-up, where we deliberately take the hip flexors out of the equation and work the torso dynamically. The hip flexors are working statically or possibly to no significant degree.

To do this, the hip flexors need to be removed from the line of action. The fat part of the AbMat goes towards the glutes, and the athlete puts the bottom of their soles together with their knees butterflied. This positioning makes the hip flexors tangential to the line of action; i.e., they cannot do any productive work. This is done deliberately. Then the athlete slowly and under control comes to seated by contracting the abdominals. This is a very dynamic bit of trunk flexion and the hip flexors are removed (Figure 8).

As the athlete fails, adduct and extend the legs to some degree. This creates more purchase for the hip flexors and brings them into the line of action. This allows the athlete to modulate the assistance and keep each rep focused on the midsection.

If performed slowly and deliberately, most athletes will fail a sit-up without an AbMat. The failure is not necessarily a neuromuscular failure. It is not necessarily a weakness or deficiency. The truth is the movement is defective minus the AbMat.

Without an AbMat, the athlete has a solid point of contact below their upper back. To move, I need to act off of something immovable. When the athlete gets full contraction of the rectus, the lower back actually goes flat. This is not enough to bring him up to seated. When this space between the low back and the floor is filled with something to act against (like the AbMat), the athlete can curl to seated.

Without the AbMat, the sit-up is a biphasic movement. While I have solid contact, I use upper rectus and create enough momentum to throw the load to the hip flexors where I have more connection. This means that the full rectus has little stimulus—it is pulling me from spinally extended through to neutral, but absent of any load. The upper rectus is worked where there is a fulcrum, so the back flattens, but it is the hip flexors that pull me to seated. There is no amount of sit-ups you can do on the ground that is ever going to work you from pubic bone to about 3 or 4 inches above the belly button. The AbMat moves the athlete from spinally extended through to neutral in the lumbar spine against a load.

How big would your bench press get if you only pushed air? You would get as strong as your abs will with a ground-based sit-up. With or without the pad, there is the same contraction and range of motion in the midsection. Without the pad, the fibers shortened but there was no load and no real work completed. With the pad, they got the same motion but under a load, and it produced fruitful work.

The two sit-ups, AbMat and GHD, complement each other beautifully. One is dynamic in the hips and static in the trunk; the other is dynamic in the trunk and static in the hip. In conjunction with the L-sit (static in the trunk and hip), they develop a formidable capacity in the midline.
Nine Foundational Movements Summary

Effective coaching can be measured as a trainer’s capacity in six areas: teaching, seeing, correcting, group management, presence and attitude, and demonstration (see “Developing Virtuosity in Coaching” article). This section helps participants learn fundamentals of the first three: teaching, seeing, and correcting the nine foundational movements of the Level 1 Certificate Course.

The nine foundational movements of the Level 1 Course are:
- Air squat
- Front squat
- Overhead squat
- Shoulder press
- Push press
- Push jerk
- Deadlift
- Sumo deadlift high pull
- Medicine-ball clean

Teaching requires knowing the necessary points of performance for proper execution, including set-up and finish positions. Seeing builds on this knowledge by requiring the trainer to assess these points of performance (and deviation of them) in real time. Correcting is the ability to improve a client’s mechanics to better adhere to the points of performance.

Each movement has at least two sections: 1) Points of Performance; and 2) Common Faults and Corrections. Where applicable, some movements also have a third section: 3) Teaching Progression. These progressions break complex movements down into simple doable steps, that focus on developing the primary points of performance in the full movement.

This section is not meant to serve as an exhaustive resource of all the knowledge, teaching progressions, or possible corrections when coaching movements. Rather, it is an introductory guide that is comprehensive enough to assist new trainers in their development.

“Stick to the basics and when you feel you’ve mastered them it’s time to start all over again, begin anew–again with the basics–this time paying closer attention.”

-Coach Glassman
AIR SQUAT

The air squat is the cornerstone movement of CrossFit and is foundational to the front squat and overhead squat. The air squat raises one’s center of mass from a seated to standing position.

1. POINTS OF PERFORMANCE

Set-up:

- The stance is with the heels at shoulder width
- Full extension at hips and knees
- Weight on heels
- Keep the chest up and brace the abdominals to maintain a neutral spine

Execution:

- Hips travel back and down
- Bottom of squat is when the hip crease is below the top of the kneecap (“below parallel”)
- Knees stay in line with the feet
- Head position is neutral

Finish:

- Return to full extension at the hips and knees to complete the movement

• Fix–Give a tactile cue to push the hips back and down.
• Fix–Block the knees forward travel of the hand at the initial portion of the descent.

FAULT–Knees not tracking in line with toes, which usually happens with them rolling inside the feet.

- Fix–“Push your knees out” or “Spread the ground apart with your feet.”
- Fix–Use a target on the outside of the knee for the athlete to reach.

FAULT–Train wreck squat: Inability to maintain lumbar curve, keep weight on the heels, keep the knees tracking in line with the feet, and get to depth all at the same time.

- Fix–“Squat Therapy”: Set up the athlete facing a wall or racked bar with a 10-inch box under their hips. Set them up in the proper stance, with heels to the box, chest close to wall. Have them squat to the box slowly, maintaining control and weight in the heels.

FAULT–Immature squat: Lumbar curve is maintained, full depth is reached, and heels are in contact with the ground, but the athlete has to cantilever forward excessively onto the quads to maintain balance.

- Fix–“Squat Therapy”: See above.

2. COMMON FAULTS AND CORRECTIONS

FAULT–Loss of a neutral spine, by flexing the lumbar curve.

- Fix–Cue the athlete to lift the chest.
- Fix–Have the athlete raise their arms as they descend to the bottom of the squat.

FAULT–Weight in, or shifting, to toes.

- Fix–Exaggerate weight in the heels by floating the toes slightly throughout the entire movement.
- Fix–Give a tactile cue to push the hips back and down

FAULT–Not going low enough.

- Fix–“Lower!” and do not relent.
- Fix–Squat to a 10-inch box or medicine ball to develop awareness of depth.

FAULT–Improper line of action: knees move excessively forward so that weight is on the toes.
FRONT SQUAT

The points of performance, common faults and corrections carry over from the air squat. The new element in the front squat is a load added in the front rack position.

1. POINTS OF PERFORMANCE

Set-up:
- Stance is with the heels at shoulder width
- Full extension at hips and knees
- Bar "racked" on the shoulders (create a shelf with the shoulders for bar to sit on), hands outside shoulders, loose fingertip grip
- Elbows high, upper arm parallel to the ground
- Keep the chest up and brace the abdominals to maintain a neutral spine

Execution:
- Hips travel back and down
- Bottom of squat is when the hip crease is below the top of the kneecap ("below parallel")
- Knees stay in line with the feet
- Head position is neutral
- Keep the bar racked properly ("elbows high") throughout the movement

Finish:
- Return to full extension at the hips and knees to complete the movement

2. COMMON FAULTS AND CORRECTIONS

All faults and corrections from the air squat apply to this movement, plus the following:

FAULT—Improper rack position where the bar is not in contact with the torso.
- Fix—Cue "elbows high" and "rest the bar on the fingertips."
- Fix—Manually adjust the rack position.

FAULT—Elbows drop during the squat.
- Fix—Cue "elbows up!" and to lift the chest.
- Fix—Place a hand or arm under the athlete's elbows to help keep them lifted.
OVERHEAD SQUAT

The points of performance, common faults and corrections carry over from the air squat. The new element in the overhead squat is a load added in the overhead position.

1. POINTS OF PERFORMANCE

Set-up:
- The stance is with the heels at shoulder width
- Full extension at hips and knees
- Bar held overhead, in the frontal plane, with a wide grip
- Active shoulders (armpits forward and shoulders push up into the bar)
- Elbows locked
- Weight on heels
- Keep the chest up and brace the abdominals to maintain a neutral spine

Execution:
- Maintain constant upward pressure and active shoulders to support the load
- Bar remains in the frontal plane or slightly behind
- Hips travel back and down
- Bottom of squat is when the hip crease is below the top of the kneecap ("below parallel")
- Knees stay in line with the feet
- Head position is neutral

Finish:
- Return to full extension at the hips and knees with the bar held overhead in the frontal plane to complete the movement

2. COMMON FAULTS AND CORRECTIONS

All faults and corrections from the air squat apply to this movement, plus the following:

FAULT–Inactive overhead position, either with flexed elbows and/or inactive shoulders.
- Fix–Cue athlete to press the bar up.
- Fix–Use a tactile cue to push the elbows straight, shoulders up, and armpits forward.

FAULT–Bar moves forward of the frontal plane.
- Fix–Cue the athlete to press the bar up and pull it back to overhead or slightly behind the frontal plane.
The shoulder press is foundational to all the overhead lifts. The key elements of the execution of this lift are maintaining a neutral spine, moving the bar in a straight path, and using the correct overhead position.

1. POINTS OF PERFORMANCE

Set-up:
- Stance is with the heels at hip width
- Hands just outside the shoulders
- Bar resting on the "rack" or "shelf" created by the shoulders
- Elbows in front of bar; elbows are lower than in the front squat, but not behind the bar
- Keep the chest up and brace the abdominals to maintain a neutral spine
- Closed grip, with thumbs around the bar

Execution:
- The action is to: press
- Retract the head (head accommodates the bar), and press the bar overhead; finishing with locked arms
- The head can return to its neutral position once the bar has passed

Finish:
- The movement finishes with the bar locked out overhead in the frontal plane with active shoulders, and hips and knees at full extension
- To return the bar, push the elbows forward and retract the face until the bar is re-racked.

2. COMMON FAULTS AND CORRECTIONS

FAULT–Leaning back with the ribs sticking out.
- Fix–Have the athlete tighten the abdominals by pulling the rib cage down (be sure to check the overhead position again after this fix).

FAULT–Bar finishes forward of frontal plane.
- Fix–Press up and pull back on the bar as it travels to overhead.

FAULT–Shoulders are not active or bent elbows.
- Fix–Cue "press up!" and use a tactile cue to lock the elbows and push the shoulders up.

FAULT–Bar arcs out around the face in an improper bar path.
- Fix–Pull head back out of the way of the bar.
- Fix–Check that elbows are not too low in the set-up.
- Fix–Block the forward travel of the object (e.g., with another PVC).
**PUSH PRESS**

The push press builds on the shoulder press. The set-up, bar path, neutral midline, and overhead position are the same as the shoulder press. Unique to the push press is a vertical dip and a drive of the hips that adds velocity to the movement.

### 1. POINTS OF PERFORMANCE

#### Set-up:
- Stance is with the heels at hip width
- Hands just outside the shoulders
- Bar resting on the “rack” or “shelf” created by the shoulders
- Elbows in front of bar; elbows are lower than in the front squat, but not behind the bar
- Keep the chest up and brace the abdominals to maintain a neutral spine
- Closed grip, with thumbs around the bar

#### Execution:
- The sequence of action is to: dip, drive, press
  - Dip: perform a shallow dip (flexion) of the hips, where the knees push forward slightly, the hips go back slightly, and the chest stays upright
  - Drive: extend the hip rapidly and fully
  - Press: retract the head, press the bar to overhead, with locked arms

#### Finish:
- The movement finishes with the bar locked out overhead in the frontal plane with active shoulders, and hips and knees at full extension

### 2. COMMON FAULTS AND CORRECTIONS

All faults and corrections from the shoulder press apply to this movement, plus the following:

**FAULT—Forward inclination of the chest.**
- Fix—Have athlete hold in the dip position and then manually adjust them to an upright torso.
- Fix—Cue a shallower dip.
- Fix—Cue “knees forward” more.
- Fix—Stand in front of athlete to prevent the chest from coming forward.
- Fix—“Dip Therapy”: Stand with back against a wall, with hips and shoulder blades touching the wall (heels slightly away); then dip and drive, keeping hips and shoulders in contact with wall.

**FAULT—Muted hip.**
- Fix—Use a tactile cue to help the athlete create flexion of the hip in the dip.

**FAULT—Pressing early: press begins before the hip extends.**
- Fix—Take the athlete back in the teaching progression performing two dip-drives before adding the press.

**FAULT—Pausing at the bottom of the dip.**
- Fix—Use a verbal cue with inflection to speed the athlete up.

### 3. TEACHING PROGRESSION (WITH THE DOWEL/PVC)

1. Dip
2. Dip-drive, slow
3. Dip-drive, fast
4. Full push press
PUSH JERK

The push jerk builds on both the shoulder press and push press. The set-up, bar path, neutral midline, and overhead position are the same, as are the dip and drive. Unique to the push jerk is the press under the bar. After the hip comes to full extension, the athlete presses against the bar and receives the lift in a partial overhead squat before standing to finish the lift.

1. POINTS OF PERFORMANCE

Set-up:
- Stance is with the heels at hip width
- Hands just outside the shoulders
- Bar resting on the "rack" or "shelf" created by the shoulders
- Elbows in front of bar; elbows are lower than in the front squat, but not behind the bar
- Keep the chest up and brace the abdominals to maintain a neutral spine
- Closed grip, with thumbs around the bar

Execution:
- The sequence of action is to: dip, drive, press under, stand
  - Dip: perform a shallow dip (flexion) of the hips, where the knees push forward slightly, the hips go back slightly, and the chest stays upright
  - Drive: extend the hip rapidly and fully
  - Press under: Retreat the hip downward and drive the body under the bar, while rapidly pressing the bar overhead
  - Receive the bar with arms locked out overhead (the torso does not have to be vertical here)
  - Stand to full extension with the bar locked out overhead

Finish:
- The movement finishes with the bar locked out overhead in the frontal plane with active shoulders, and hips and knees at full extension.

2. COMMON FAULTS AND CORRECTION

All faults and corrections from the shoulder press and push press apply to this movement, plus the following:

FAULT–Lack of full hip extension.
- Fix–Cue: ‘Jump higher.’
- Fix–Place your hand at the top of the athlete’s head when fully standing; keep it at that height and then ask the athlete to hit your hand during the drive.
- Fix–Take the athlete back to steps 1-3 of the teaching progression. Focus on reaching hip extension before moving onto the next step.

FAULT–Poor active overhead position (particularly when receiving the bar).
- Fix–Cue the athlete to press up on the bar.

FAULT–Not standing up with the bar before re-racking it on the shoulders.
- Fix–Cue the athlete to keep the bar overhead until the legs are straight.

FAULT–Landing too wide.
- Fix–Exaggerate the correction and cue the athlete to do the movement without the feet moving from under the hips.
- Fix–“Block” the feet with tape or chalk on the floor so they cannot go too wide.

3. TEACHING PROGRESSION (STEPS #1-3 WITHOUT THE DOWEL/PVC; STEP #4 WITH THE DOWEL/PVC)

1. Jump and land with hands at sides. Stick the landing before standing.
2. Jump and land with hands at shoulders throughout the move. Stick the landing before standing.
3. Jump with hands at shoulders and extend them overhead after the hip opens and just before landing. Stick the landing before standing with arms overhead.
4. With the dowel/PVC in hands, complete the full push jerk.
The deadlift is foundational to all the pulling lifts, and the key elements of execution are maintaining a neutral midline and keeping the object close to the frontal plane.

1. POINTS OF PERFORMANCE

Set-up:
• Stance is with the heels between hip width and shoulder width
• Weight in heels
• Keep the chest up and brace the abdominals to maintain a neutral spine
• Shoulders over or slightly in front of the bar
• Bar in contact with the shins
• Arms straight
• Symmetrical grip outside the knees, just wide enough to not interfere with knees
• Head neutral or looking on the horizon

Execution:
• Drive through the heels
• Extend legs while hips and shoulders rise at the same rate
• Once the bar passes the knees, the hip opens
• Bar maintains contact with the legs the entire time
• On return to the floor, push hips back while the shoulders move forward, delaying the knee bend
• Once bar descends below the knees and the torso angle is set, bend the knees to return the bar to the set-up position

Finish:
• The movement finishes with the bar lifted to full extension of the hips and knees

2. COMMON FAULTS AND CORRECTIONS

FAULT–Loss of lumbar curve by flexing the spine.
• Fix–Abort and decrease the load to where the lumbar curve can be maintained.
• Fix–At a lower weight, cue to the athlete to “lift the chest” and do not relent.

FAULT–Weight on, or shifting, to toes.
• Fix–Have athlete settle into the heels and pull hips back. Have them focus on driving through heels.

FAULT–Shoulders behind bar on set-up.
• Fix–Raise hips to move the shoulders over, or slightly in front of, the bar.

FAULT–Bar collides with knees on the descent.
• Fix–Cue the athlete to initiate the return by pushing the hips back and delaying the knee bend.

FAULT–Bar loses contact with legs.
• Fix–Cue “Pull the bar in to your legs the whole time.”

FAULT–Hips rise before the chest (stiff-legged deadlift).
• Fix–Cue to “lift your chest more aggressively.”
• Fix–Give a tactile cue at their hips and shoulders to have them lift in unison.

FAULT–Shoulders rise without the hips. Bar travels around the knees instead of straight up.
• Fix–Cue the athlete to “push the knees back as your chest rises.”
• Fix–Be sure the athlete is set up correctly and that the hips are not too low.
The sumo deadlift high pull builds on the deadlift, but uses a wider stance and a narrower grip. The sumo deadlift high pull also adds velocity and range of motion. This movement is a good example of a core-to-extremity movement, where the power is generated by the hips and legs and then handed off to the upper body.

1. POINTS OF PERFORMANCE

Set-up:
- Stance is with the heels wider than shoulder width, but not so wide that the knees roll inside the feet
- Weight in heels
- Keep the chest up and brace the abdominals to maintain a neutral spine
- Shoulders over or slightly in front of the bar
- Bar in contact with the shins
- Arms straight
- Symmetrical grip inside the knees

Execution:
- The sequence of action is to: deadlift, shrug, pull
- Drive through the heels
- Extend legs while hips and shoulders rise at the same rate
- Once the bar passes the knees, the hip opens
- Shrug, with straight arms
- Arms follow through by pulling the bar below the chin with the elbows high and outside.
- Return the bar down fluidly in the reverse sequence: arms, then shoulders, then hips, then knees, back to the set-up position

Finish:
- The movement finishes with the knees and hips at full extension and the bar pulled to the chin with the elbows high and outside.

2. COMMON FAULTS AND CORRECTIONS

All faults and corrections from the deadlift apply to this movement, plus the following:

FAULT—Pulling early: the hips are not completely open before the shrug or arm bends.
- Fix—Take the athlete back in the teaching progression to work the deadlift-shrug at a speed where the timing is correct. Once the deadlift-shrug is correct at speed, try two deadlift-shrugs for every one full sumo deadlift high pull.

FAULT—Athlete pulls with the elbows low and inside.
- Fix—Cue: “Elbows high!”

FAULT—The athlete moves too slow segmenting the movement.
- Fix—Cue “Faster!”

FAULT—Incorrect descent (hips flex before the arms release).
- Fix—Slow down the movement practicing the return in a segmented fashion, before re-introducing speed.

FAULT—Shoulders rolling forward during the pull.
- Fix—Correct the position with a dowel/PVC in the set-up or at the top of the pull.
- Fix—Widen the grip and/or reduce the range of motion to where the shoulders remain in the proper position.

3. TEACHING PROGRESSION (WITH THE DOWEL/PVC)

1. Sumo deadlift
2. Sumo deadlift shrug, slow
3. Sumo deadlift shrug, fast
4. Full sumo deadlift high pull
MEDICINE-BALL CLEAN

The medicine-ball clean builds on the deadlift and the sumo deadlift high pull. Unique to the medicine-ball clean is the pull-under, which allows the athlete to bring the object to a position of support (the front rack position).

1. POINTS OF PERFORMANCE

Set-up:
- Stance is with the heels at shoulder width or slightly wider
- Weight in heels
- Keep the chest up and brace the abdominals to maintain a neutral spine
- Shoulders over the ball
- Ball on the floor in between the legs with clearance for the arms
- Arms straight, palms on the outside of the ball with fingertips pointing down
- Head can be up, with eyes on the horizon

Execution:
- The sequence of action is to: deadlift, shrug, pull-under, stand
- Drive through the heels
- Extend the hips and legs
- Shrug, with straight arms, pulling the body into a front squat, with the elbows beneath the ball
- Stand to full extension with the ball at the rack position to complete the movement

Finish:
- The movement finishes with the knees and hips at full extension with the ball at the rack position

• Fix–Place your hand at the top of the athlete’s head while he/she is standing tall. Have the athlete do a medicine-ball clean being sure to hit your hand during the drive before pulling into the front squat.

FAULT–Curling the ball.
- Fix–Stand in front of the athlete to block them from curling (can also use a wall).
- Fix–Require the athlete to have the laces (or any markings) of the ball remain facing out for the entire movement.

FAULT–Collapsing in the receiving position.
- Fix–Take the athlete back to the teaching progression practicing the pull-under with sound front squat mechanics.
- Fix–Cue the athlete to “lift the chest” in the front squat.

FAULT–Receiving too high.
- Fix–Have the athlete hold the ball without their fingers, using palms or fists only.
- Fix–Hold ball at the peak of the shrug and let athlete practice the pull-under without moving the ball higher.

FAULT–No pull-under, by tossing, or flicking the medicine ball up.
- Fix–Have the athlete hold the ball at the chest until the legs are straight.

2. COMMON FAULTS AND CORRECTIONS

All faults and fixes from the deadlift and sumo deadlift high pull apply to this movement, plus the following:

FAULT–Lack of full hip extension.
- Fix–Take athlete back to the teaching progression, and have him/her do two deadlift-shrugs for every one medicine-ball clean.

3. TEACHING PROGRESSION (WITH THE BALL)

1. Deadlift
2. Deadlift-shrug
3. Front squat
4. Pull-under
5. Full medicine-ball clean
Being an expert coach is about improving fitness and safeguarding the health of one's clients. Keeping clients safe includes all the considerations raised in the Developing Virtuosity in Coaching article; i.e., knowing the movement points of performance and being able to identify and correct violations. However, client safety also includes multiple logistical factors, such as programming, specific needs for special populations, equipment layout and accurate representation of one's credentials. This article is meant to prime new Level 1 Trainers to responsibly train others while gaining expertise.

Mitigate Client’s Risk Of Rhabdomyolysis
Rhabdomyolysis, while rare, can develop from high-intensity or high-volume exercise, including CrossFit or any other process that damages muscle cells. Rhabdomyolysis (often simply referred to as “rhabdo”) is a medical condition that may arise from breakdown of muscle tissue and release of the muscle cells’ contents into the bloodstream. This process can damage the kidneys and may lead to renal failure or death in rare cases. Rhabdo is diagnosed when a patient with an appropriate history has an elevated level of another molecule, creatine kinase, also known as CK or CPK. CPK is easier to measure in the blood than myoglobin and is generally used as a marker for rhabdo, even though it is the myoglobin that does the damage.

Treatment consists of generous amounts of intravenous fluids to dilute and flush the myoglobin through the kidneys. In the worst cases, patients may need dialysis while the kidneys recover. Death, though rare, can result when the kidney failure causes imbalances in the usual electrolytes, which may cause cardiac arrhythmias. Most patients make a complete recovery after being rehydrated with IV fluids over anywhere from several hours to a week or so, depending on the severity.

There are a few ways a CrossFit trainer can protect athletes from rhabdomyolysis:

- Follow the charter of mechanics, consistency, intensity.
- Know the movements that have a higher rate of rhabdomyolysis incidence (those that prolong the eccentric contraction), and be mindful of the total volume that is programmed with these exercises.
- Scale workouts for clients appropriately.
- Avoid progressive scaling.
- Educate clients on the symptoms of rhabdomyolysis and when it is appropriate to seek medical attention.

Following the mechanics-consistency-intensity charter is to best prepare the athlete for long-term success, but it is also a way to mitigate the potential of developing rhabdomyolysis (and other injuries). Slow and gradual increases in intensity and volume allow the body to acclimate to high-intensity and higher-volume exercise. Even athletes who quickly demonstrate sound mechanics still need a gradual increase in intensity and volume. When working with new athletes, trainers should focus on using modest loads, reducing volume and coaching the athlete on technique. At affiliates where there are “elements” or “on-ramp” classes that last a couple of weeks, athletes should still be heavily scaled beyond this introductory period to ensure adequate time to acclimate to CrossFit training. If there are no separate classes for beginners, treat the workouts as technique sessions for newer athletes--focus on their mechanics rather than speed or load. There is no set protocol for how quickly to increase intensity, but it is wise to err on the side of caution and work toward long-term fitness. Multiple months at scaled loads and volumes are well within a normal timeframe for even the best athletes, with gradual increases in intensity implemented after that. Trainers need to frequently check in with athletes to determine how the previous dose of exercise affected them. Although intensity is a significant part of CrossFit, each athlete has his or her entire life to continue to improve fitness and tolerance for intensity.
The second way to mitigate the risk of rhabdomyolysis is to know the movements associated with a higher rate of incidence. Beginner athletes should keep “negatives” (movements which prolong the eccentric phase) to a minimum. Although negatives can be an effective way to increase strength, they should not be used in high volumes with beginners. Athletes may increase the volume of negatives gradually over time.

While the eccentric phase of movements cannot and should not be avoided, there are movements in which people are more likely to prolong the eccentric phase. In CrossFit, these tend to be jumping pull-ups and full-range-of-motion Glute-Ham Developer (GHD) sit-ups. In the jumping pull-up, the athlete should not prolong the descent but should instead immediately drop to an extended-arm position once the chin has cleared the bar, absorbing the impact with the legs. Similarly, in the full-range-of-motion GHD sit-up, newer athletes should use fewer repetitions and potentially a shortened range of motion until capacity is developed. It is also prudent for trainers to scale the number of repetitions and the range of motion for athletes who do not routinely use GHD sit-ups regardless of their CrossFit experience. There are no exact rules for total volume, but beginners and new CrossFit athletes (and even advanced CrossFitters who have not been routinely using the GHD) should start with relatively low repetitions of the partial-range-of-motion GHD sit-up (i.e., to parallel) and gradually increase from there with consistent exposure.

Progressive scaling—the practice of continually adjusting the difficulty of a workout so that an exhausted athlete can keep moving—must be avoided with the beginner or even intermediate athlete. Allow these athletes to stop and take rest as needed to complete the workout. An example may be if the trainer keeps lowering the load so the athlete does not have to stop completing reps (e.g., 135-lb. barbell for thrusters dropped to 115 to 95 to 65 to 45 across the workout duration). Progressive scaling may be used, but it must be applied very cautiously even with the most advanced of athletes.

It is also wise to educate athletes about the potential risk for rhabdomyolysis, strategies to reduce the risk and the symptoms. This will help them understand the rationale for scaling their workouts, especially when they are zealous to perform a workout “as prescribed” (“Rx’d”).

Alcohol and drug use increase the risk of rhabdomyolysis, and athletes should avoid heavy drinking, especially in proximity to training. Certain medications, including statins (cholesterol-lowering agents), increase the risk of rhabdomyolysis.

Symptoms of rhabdomyolysis include severe generalized muscle pain, nausea and vomiting, abdominal cramping, and, in severe cases, dark-red or cola-colored urine. The discoloration of the urine comes from the muscle’s myoglobin, which is the same molecule that gives red meat its color. If these symptoms appear following a workout (or at any time with regard to dark-red urine), the athlete should seek medical attention immediately.

The athletes at highest risk seem to be those with a reasonable baseline level of fitness obtained through some non-CrossFit training, those who are returning to CrossFit after a layoff, or even experienced CrossFitters who reach volume or intensity significantly outside their established “norm.” These athletes have sufficient muscle mass and conditioning to create enough intensity to hurt themselves. Generally, the most deconditioned seem to be at less risk (but not zero). It is suspected they do not have enough muscle mass or the capacity to generate high levels of intensity. This being said, athletes and trainers must properly scale and focus on mechanics with every client regardless of current capacity.

Minimize Equipment- And Spotting-Related Injuries
Beyond following the charter of mechanics, consistency and intensity, affiliate owners can further minimize risk of injury within their gym. Very real risks exist from equipment condition, use and arrangement, as well as from improper spotting of athletes during movements.

Equipment condition refers both to installation and day-to-day maintenance. Installation often applies to building pull-up rigs, hanging gymnastics rings, assembling a GHD, among other items.
Professional assistance should be used when an owner is inexperienced.

Pull-up-bar rigs and gymnastic rings and associated straps should be designed to bear a load far higher than the expected maximum weight to be supported. These structures need to be tested at maximum loading before regular client use.

Regularly scheduled maintenance of all equipment is paramount. Equipment that places the athlete’s feet off the ground or inverts the athlete requires extra time and attention. Support pieces like straps, racks or bars and locking mechanisms need to be kept in working order and checked regularly for routine wear. Some may become compromised during use. Where there is a risk for handles or collars to come apart, dumbbells, kettlebells and even barbells need to be inspected regularly for integrity. Trainers must repair, replace, and discontinue use of faulty equipment immediately.

Arrangement refers to the layout of equipment and athletes during a class or workout. Each athlete needs enough space to perform the movements, with an additional buffer to account for the errant-moving equipment, missed attempts and safe passage of coaches or other athletes. Under no circumstances should a trainer permit extra equipment like bars, plates, boxes, etc. to be left lying around the workout area. This equipment may trip athletes or cause a ricochet if other equipment lands on it.

It is also imperative for a trainer to prepare for falls during dynamic movements. It is possible that an athlete may lose his or her grip during a kip (pull-up or muscle-up). Trainers may encourage athletes to wrap their thumbs around any bar in an effort to provide additional feedback to the athlete. This is not foolproof, however, and can sometimes be even less secure particularly for athletes with small hands. Whatever the hand position chosen, it does not replace the necessity of the athlete to develop body awareness of when to end the movement if his or her grip is compromised (wrapping thumbs is always recommended for barbell and ring movements to help provide better balance and control, especially in higher-risk scenarios such as a bench press or muscle-up). Boxes and racks should not be beneath, behind or directly in front of these athletes. Adjustable rings should be lowered to the appropriate height. Where assistance boxes are necessary, they are best placed to the side of the working athlete (and not in an other athlete’s way) to leave a clear path should an athlete leave the apparatus prematurely. A suggestion for trainers trying to manage these risks is to do a “dry run” of the workout before it begins: check the working space for each athlete for each of the proposed movements. This can be as simple as organizing the class to rotate stations on the trainer’s call and perform a quick walk-through to check spacing and arrangement. Trainers can then instruct participants to move to the same spot during the workout to ensure safety.

Athletes also need instruction regarding how to bail safely from lifts and how to spot other athletes where appropriate. In most weightlifting movements, the athletes only need to learn how to bail safely. Trainers need to teach athletes this skill and allow them to practice it before any significant load is lifted. Trainers should also ensure enough empty space exists around a working athlete so a missed lift does not have a ricochet effect, as mentioned above. Spotting is not recommended for weightlifting movements, except for a bench press (where it is mandatory) and potentially a back squat (especially where a low-bar position is used). A trainer cannot assume athletes understand how to spot correctly, and again, instruction and practice at lighter loads are necessary.

Experienced trainers or athletes may also provide a spot for gymnastics movements. Trainers or athletes should employ a spot that minimizes risk to both spotter and athlete. Generally, gymnastics movements are spotted at the torso or hips to provide adequate support for the movement, but spotting at the hips or legs may be successful (e.g., handstands). The spotter may be to the rear of the athlete if the risk of getting hit is low (e.g., ring support, GHD sit-up), but often a position beside the athlete is best (e.g., handstand).

Trainers need to be sure equipment is cleaned regularly to reduce the chance of infection, and proper disinfectants and sterilizers, with clean cloths, should be staged near
the gym floor to clean blood off bars immediately. A blood-spill cleanup procedure can be found here.

**Hydration**

Drink when you are thirsty, do not when you are not.

We advise against rehydration strategies that encourage consumption of fluids to prevent loss of body-weight during activity. Dehydration during physical activity is a normal physiological process, and the thirst mechanism is sufficient in regulating hydration and serum sodium concentration during exercise.

Drinking beyond thirst in an attempt to prevent body-weight loss during exercise offers no benefit to health or performance. It also presents a serious risk of exercise-associated hyponatremia (EAH), a potentially deadly dilution of the body’s serum sodium concentration. EAH is caused by overconsumption of fluid, and can be viewed as an iatrogenic condition due to the prevailing belief that exercising athletes should drink “as much fluid as tolerable” during training.

“Fluid” that can contribute to EAH includes electrolyte-enhanced sports drinks. Contrary to popular belief, these commercial beverages do not reduce risk of hyponatremia. Because of flavoring and sugar content, these drinks may present greater risk for overconsumption of fluid than water alone, increasing the risk of potentially deadly EAH in athletes.

**Special Populations**

Any potential athlete with a medical condition needs to be cleared by a physician for exercise before a trainer recommends a fitness regime. A medical-history form can be a useful tool for a trainer to assess any potential issues, although trainers are also encouraged to ask questions regarding medical status and be aware of common medical conditions that need clearance (e.g., diabetes, prescription medications).

Common special populations include pregnant athletes, and a trainer should still request medical clearance and guidelines from the physician once the condition is known. The CrossFit Journal contains many resources regarding scaling for pregnant athletes. A trainer should be especially aware of reducing the risk of potential falls in workouts (e.g., box jumps, rope climbs), and be observant.
for complaints of calf pain or swelling, which can be signs of more serious issues.

Many athletes have found improved recovery while staying active after surgery. While CrossFit workouts are indeed scalable for these athletes, trainers should seek clearance from the surgeon before restarting a workout regime with these athletes.

A trainer’s scope of practice allows promotion of any individual’s desire to participate in exercise and provision of direction; this does not extend to diagnosing or treating any medical condition.

**Legal Use Of The “CrossFit Level 1 Trainer” Credential**

Passing the exam at the Level 1 Certificate Course earns an individual the designation of CrossFit Level 1 Trainer, which can be abbreviated “CF-L1 Trainer.” The American National Standards Institute (ANSI), the third party through which the course is accredited, has approved this title.

It is important for CrossFit trainers to:

- Use the correct terminology for the credential.
- Act in accordance with the Trainer Licensing Agreement.

Each participant accepted this Trainer Licensing Agreement during registration for the Level 1 Course.

A CrossFit Level 1 Trainer holds the Level 1 Certificate. The Certificate is valid for a period of five years. See the Participant Handbook for details regarding maintaining an active trainer status. CrossFit’s public Trainer Directory can be used to verify any individual’s credentials. Those who pass the exam should not use the term “certified.” While the distinction in terminology appears minor, the use of “Level 1 Certified” is a misrepresentation of the credential and not endorsed by CrossFit. A “Certificate Course,” such as the Level 1 Certificate Course, is a course with learning objectives and a test that is tied to those specific objectives. It includes both an educational or “training” component, as well as a test to determine if the participant has learned the course material. A “certification,” such as the Certified CrossFit Trainer or Certified CrossFit Coach credentials, is only a test with no educational component. Certifications are designed to assess competency across an entire profession. Preparation work for the certifications is done on the applicant’s own time and under his or her own guidance. In layman’s terms, and in the case for the CrossFit credentials, a certification generally demonstrates a greater scope of professional competency than a certificate.

The CrossFit Level 1 Trainer credential may be used next to one’s name similar to other educational credentials (e.g., M.S., R.N., D.C.). It may be used on a website with a biography or on a business card. It does not allow use of the name “CrossFit” to market services (e.g., personal CrossFit training, CrossFit classes). To market services, a trainer must first apply to run a CrossFit affiliate.

During the Level 1 Course, participants were exposed to a large amount of knowledge. Much of it can be found elsewhere free to the public and is commonly known to or accepted by the fitness industry in some form. However, this knowledge is not found so organized and packaged outside the Level 1 Course. This defines the CrossFit method. An individual can use the CrossFit method to train himself or herself and friends and family without charge. However, to use the CrossFit name or logo (i.e., the CrossFit brand) to market services (e.g., training), a Level 1 Trainer must affiliate. An individual is not permitted to advertise, market, promote or solicit, in business or service, without licensing the CrossFit name. Licensing the CrossFit name is called “affiliation.” More information regarding affiliation can be found here.

The risk-to-benefit ratio for CrossFit participants is very low; however, it is also the trainer’s responsibility to maintain the low risk for his or her clients. The guidance presented here should serve as a resource for new CrossFit trainers to help best keep clients safe in the gym.
Developing Virtuosity in Coaching

The term virtuosity—"doing the common uncommonly well"—may be used to describe workout technique when an athlete displays near-perfect mechanics even at high loads and speeds. It is considered the mastery CrossFit participants seek to achieve. Chasing virtuosity can also be used to describe the path to becoming an elite CrossFit coach. Coaching virtuosos display an unmatched capacity to improve others’ fitness, and yet these virtuosos never consider their development complete and always seek to improve their craft.

The Level 1 Certificate Course is an introductory survey of the CrossFit methodology, and attaining the Level 1 Certificate should be considered the first step in becoming a CrossFit trainer. Passing the Level 1 test indicates an individual has basic comprehension of the CrossFit program and earns the designation CrossFit Level 1 Trainer (CF-L1 Trainer).

The purpose of this article is to provide guidance for how a new trainer can take additional steps to develop virtuosity in his or her coaching.

Qualities Of An Effective Trainer

An effective trainer must have capacity in six different abilities:

1. Teaching.
2. Seeing.
3. Correcting.
4. Group and/or gym management.
5. Presence and attitude.
6. Demonstration.

This list can be viewed as similar in principle to the list of 10 general physical skills for fitness (What is Fitness? Part 1). Athletes with capacity in each of the 10 skills are considered fitter than athletes who demonstrate excessive capacity in any one skill to a detriment of capacity in the others. Similarly, effective trainers demonstrate capacity in each of the six abilities listed above, not just one or two. The more effective the trainer, the greater his or her capacity in each ability. This is also the focus of study and practical application at the Level 2 Certificate Course.

1. **Teaching**—The ability to effectively articulate and instruct the mechanics of each movement. This includes the ability to focus on major points of performance before more subtle or nuanced ones, and the ability to change instruction based on the athlete’s needs and capacity.

A trainer’s ability to teach others effectively reflects both his or her knowledge as well as the ability to effectively communicate that knowledge. To communicate knowledge to others, a coach must understand what defines proper mechanics and what causes bad or inefficient movement. This requires continual study, and one’s teaching will improve with greater understanding in all fields that intersect with fitness.

An effective teacher also has a unique ability to relate to every student, regardless of his or her background and ability. This requires the teacher to distill a large body of knowledge to a single or a few salient points specific to the current need of the athlete and the movement being taught. An effective teacher also takes ownership for recognizing when communication between the teacher and athlete breaks down. Generally, the more forms of communication a teacher is able to employ (verbal, visual, tactile, use of different examples/analogies, etc.), the more likely training will be a success.

2. **Seeing**—The ability to discern good from poor movement mechanics and to identify both gross and subtle faults whether the athlete is in motion or static.

An effective trainer demonstrates the ability to see movement and determine whether the mechanics are sound or unsound. This ability first requires knowledge of when to observe and evaluate very specific aspects of the athlete’s movement (e.g., trunk-to-femur relationship...
for hip extension, center of pressure on feet for posterior-chain engagement). It also requires knowledge of the differences between good and poor positions. An effective trainer has the ability to see faults both when the athlete is moving (e.g., hip extension) and not moving (e.g., the receiving position of a clean). Newer coaches tend to have the greatest difficulty spotting movement faults while athletes are moving.

3. Correcting–The ability to facilitate better mechanics for an athlete using visual, verbal and/or tactile cues. This includes the ability to triage (prioritize) faults in order of importance, which includes an understanding of how multiple faults are related.

Once a trainer can teach the movements and see faults, he or she is then able to correct the athlete. Effective correction makes an athlete’s mechanics better.

Correcting hinges on the trainer’s ability to:

1. Use successful cues.
2. Know multiple corrections for each fault.
3. Triage faulty movement.
4. Balance critique with praise.

Any cue that results in improved movement mechanics is successful and therefore a “good” cue. There are no specific formulas, formats or rules to follow for cues, and their value is based on the result. However, generally making cues short, specific and actionable tends to result in a greater success rate. A trainer needs multiple strategies for each fault because different clients often respond to the same cue in a different manner.

When multiple faults occur at once, a trainer is best served by attacking them one at a time in order of importance (i.e., triaging). The ordering is based on the severity of the deviation from ideal and the athlete’s capacity relative to the task; no single ordering of faults can be used across all athletes in all applications. Throughout the cueing process, a trainer often needs to celebrate small changes or even just celebrate hard work to build rapport and acknowledge a client’s effort even when those efforts are not immediately successful.

Newer trainers tend to be lacking in their ability to see and correct movement. When coaching others, trainers need to focus on movement. Good coaches relentlessly watch movement with a critical eye. Good coaches are constantly asking the following questions: How could an individual be more efficient and safe? What cues would result in a better position? How can cues be delivered to produce the best response from the athlete? Good coaches produce noticeable changes in their athletes’ movement. To develop this critical eye, coaches can work with great trainers, film themselves or other athletes, or film classes.

4. Group Management–The ability to organize and manage, both at a micro level (within each class) and at the macro gym level. This includes managing time well; organization of the space, equipment and participants for optimal flow and experience; planning ahead; etc.

Group management speaks to the trainer’s ability to reduce the logistical set-up and preparation time during a class so as to maximize the amount of teaching and movement time. This means the trainer plans the instruction ahead of time and perhaps pre-arranges the equipment and/or weights to avoid excessively talking at the expense of moving.

Allowing for enough practice time in every class is necessary for both the trainer and client. Less practice time gives the trainer less time to observe and cue movement mechanics, and it gives the client less time to work on movement with improved form.

Every student should feel he or she received personal coaching within the group atmosphere. Regardless of experience, trainers should make an honest assessment of the time and attention given to each client after each training session. The goal is to maximize a trainer’s effectiveness and reach.
5. Presence and Attitude—The ability to create a positive and engaging learning environment. The trainer shows empathy for athletes and creates rapport.

Although presence and attitude are more intangible than the other criteria, clients immediately feel their lack. “Positive” should not be interpreted as fake or forced. A

“What we are practicing not weightlifting but commitment. Commitment spawns success. Only by redoubling our efforts do we best succeed. Expecting success to motivate our efforts is the loser’s gambit.”

-Coach Glassman

6. Demonstration—The ability to provide athletes with an accurate visual example of the movement at hand. A trainer may do this using himself or herself as an example or by choosing another athlete to provide the example. This requires a strong awareness of one’s own movement mechanics. Demonstration also includes the concept of leading by example: A trainer should follow his or her own advice and be an inspiration to clients.

A trainer must be able to provide a visual demonstration of the movement. Demonstration is a useful teaching tool to show safe and efficient movement and range-of-motion standards. It is acceptable to use others for this purpose in cases of physical limitations. A trainer with a good eye should have no problem quickly finding someone for this purpose.

Demonstration extends beyond moving well in a single class; demonstration also means a trainer leads by example, adhering to the same range-of-motion standards as his or her clients, following his or her own programming or nutrition advice, or putting forth the positive and supportive attitude he or she wants to see in clients.

Guiding Tenets While Gaining Expertise

Expert training comes from years of experience and study long after the completion of the Level 1 Certificate Course. However, a novice or less experienced person can still train others. Three important principles should guide trainers at all levels:

1. Master the fundamentals.
2. Limit the scope.
3. “Know what you don’t know.”

Master the Fundamentals

New athletes are most successful by adhering to the charter of mechanics, consistency and then intensity. Coaches often manage the time frame in which clients reach high levels of intensity. A trainer should not be fooled into thinking new clients need overly complex movements and high-volume workouts to be “sold” on his or her services. Coach Glassman wrote specifically about this in an open letter to CrossFit trainers in 2005 (Fundamentals, Virtuosity, and Mastery: An Open Letter to CrossFit Trainers). Trainers need to take time teaching clients proper mechanics and ensuring they move correctly before high levels of intensity are applied. Insist on consistently safe and correct mechanics, then very gradually increase load and volume—watching closely for
movement faults. Not only does this decrease the risk for injury, but it also sets athletes up for greater success in the long term: efficient and sound mechanics allow ever-increasing speeds and loads.

Applying intensity at either end of the spectrum—too much too soon vs. too little or none at all—blunts the overall benefit from the program. Pushing one’s limits drives new adaptation, and this cannot happen without intensity. On the other hand, pushing too hard too soon may result in long-term inefficiencies or injury. When the trainer is in doubt, it is better to err on the side of caution and progress slowly. Even at low intensity, many participants see benefits simply from performing varied functional movements, and it will become more clear over time that intensity can be added.

Limit the Scope

Many CrossFit affiliates follow a group-class model, which can be difficult for a novice coach. The demands of teaching and class management often take the attention away from seeing and correcting movement. New trainers are encouraged to coach friends and family in individual or small group sessions (two or three athletes) to perfect their ability to improve mechanics before taking on large group classes. Another option is to assist a head coach for classes and small group training. The new trainer can improve his or her ability to discern poor movement and cue good movement, while the head trainer addresses the other logistics. New trainers should seek out internships or assistant roles at local affiliates to gain this experience. A trainer needs to increase the size of classes gradually to continually deliver quality training, as Coach Glassman articulated in 2006:

“The reduced trainer to trainee ratio can dilute the professional training standards that we’ve embraced. This natural dilution can, however, be compensated for by the trainer’s development of a skill set that is only very rarely found. To run group classes without compromising our hallmark laser focus and commitment to the athlete, the trainer has to learn to give each member of the group the impression that he is getting all the attention that he could get in one-on-one training, and that requires tremendous training skill.

We’ve seen this skill fully and adequately developed by only one path—gradually migrating from one-on-one to group sessions. The trainers who are running group classes without growing into them are typically not working to the professional training standards that we’ve described.

All the demands on the trainer skyrocket in this situation, however. Attention, enthusiasm, voice projection, and engagement all have to escalate. It is an acquired skill—an art, really. Our goal is too give so much attention and “in your face” presence to each participant that each is actually grateful that he didn’t get more attention. The essential shift is that the level of scrutiny and criticism is ratcheted up along with the rate of praise and input for each client. The trainer becomes extremely busy. There’s no way a new trainer can walk into this environment and do well.”

Beyond the demands of running one quality class, there is also the demand of delivering that quality training for multiple sessions a day. As Coach Glassman said when training in Santa Cruz, California:

“Training with the attention and commitment that we bring to our practice, though fun and immensely rewarding, is also draining, and five appointments per day is about all we could handle without an unacceptable drop in energy, focus, and, consequently, professional standards.

My commitment to my athletes is clearly expressed and perceived in our first meeting. I am all theirs. They are the object of my focus and the focus of my conversation. They come back not because of my physical capacity but because they believe in my capacity to develop theirs.”
This notion of limiting the scope for the novice trainer means avoiding committing to too many clients or classes beyond what will result in quality training. Although quality training is subjective, the goal should be to have every athlete leave a session with improved movement and a positive experience so he or she is excited to return for the next session.

“Know What You Don’t Know”

The directive know what you don't know means trainers should have the clarity and self-awareness to admit when they do not know something. Whether it is a question regarding anatomy in the squat, why someone has back pain or why excess sugar can compromise health, it is not wise to try to make up information when an issue is beyond the current level of knowledge or scope of practice. Working only within the limits of one’s knowledge will help protect the safety of clients and build credibility. A trainer cannot be expected to know all things related to health and fitness. Develop and foster a community of other professionals clients can be referred to with confidence when necessary. Seek to learn the answers to any questions, and in the case of any medical condition, the trainer should always refer the client to a physician.

Pursue Excellence

To be a successful trainer (or affiliate), the recommended “business model” in CrossFit is the relentless and continual pursuit of excellence. Pursuing excellence was the guiding tenet from the early days of the original CrossFit gym in Santa Cruz, and the concept continues to guide larger decisions related to CrossFit.com, the CrossFit Journal, and the Level 1 Certificate Course, for example. The overarching purpose is to bring more quality training to more people. Rather than devising a business model in the pursuit of money, devise one that is focused on making the training (and, by extension, the clients) better. That difference is the difference between success and failure:

“The pursuit of excellence is the heart of the CrossFit business plan. Money is, for many, elusive because markets are unknowable. But while markets are unknowable, excellence is obvious to most everyone, especially in free and large markets. If you can accept the three premises that:

1. Markets are largely unknowable
2. Excellence is obvious to everyone, and
3. Free markets reward excellence

it becomes obvious that the most effective business plan comes from achieving excellence and letting the market bring the money to you (Figure 1). The efficiency and effectiveness of this paradigm are breathtaking.”

Marketing (in the sense of advertisements or promotions) is not fundamentally at the heart of improving the product or service, and therefore, not in the pursuit of excellence. To pursue excellence, ask the question, “What would make the training or the affiliate better?” An analysis of pros and cons can muddle every decision, and most issues can be decided by a simple question: “Will it improve the quality of the programming or the training experience?” If the answer is “Yes!” you are most likely pursuing excellence.
Advance One’s Education

It is recommended that trainers never stop learning. A CrossFit trainer should consider the Level 1 a first step in education and should continue to educate himself or herself in all subject areas related to fitness—anatomy, physiology, nutrition, biomechanics, etc. A greater understanding of each will help with teaching clients, specifically when answering why a particular method or movement should be included in training. Working with other coaches, including specialty coaches, can help a trainer better see movement faults and learn correction strategies. Understand the mechanics, cues and techniques of complex movements and be able to teach them to others.

To keep up with athletes’ progress, a coach must continue to refine and advance understanding of advanced skills. If a trainer’s clients are not testing the limits of his or her knowledge, the trainer is not doing a good enough job with them. An expert coach is eager and proud to have a student exceed his or her abilities but seeks to delay it by staying ahead of the athlete’s needs rather than by retarding the athlete’s growth.

Here are some specific suggestions for how trainers can advance their education:

1. First, and foremost, teach to learn. There are ways to teach to learn responsibly; i.e., by insisting on the points of performance taught at the L1 and adhering to the charter of mechanics, consistency and intensity. These guidelines enable trainers to learn and gain experience while safeguarding the health and well-being of people in their care. The key is actually working with other people in a dynamic environment, whether they are friends or family or athletes at a local affiliate. It is only through experience that a trainer will learn and gain competency. Understanding biochemistry, anatomy and teaching methodologies is important and supportive of this endeavor, but it is not enough to allow a trainer to apply knowledge in real time.

2. Watch other coaches—specifically those who are more experienced. Watch what they watch and when they watch for it. Listen to their cues. The best coaches often need very few words to produce noticeable improvement in mechanics. Also watch their rapport with clients. What draws clients to them?

3. Attend a Level 2 Certificate Course (L2). The L2 is for trainers to work on their training (specifically seeing and correcting movement) in the presence of their peers. The course is designed to give trainers practical feedback based on the six qualities of an effective trainer. Where the Level 1 Course is tailored toward understanding the conceptual framework of CrossFit, the goal of the L2 is to improve the skill set needed every day by a trainer.

4. Attend additional courses. CrossFit has a host of specialty courses: Weightlifting, Gymnastics, Endurance, Kettlebell, Kids, Football, Powerlifting, Movement and Mobility, etc. Some of these specialties are covered briefly at the Level 1 Certificate Course, but the dedicated courses offer an in-depth look at a particular modality or skill set. Specific methods for teaching these techniques may differ from the general information provided in the Level 1 Course. Seek to understand how the differing methodologies are appropriate for different applications. Courses are also offered under CrossFit’s Certification branch and cover such topics as anatomy and physiology and best business practices. Those pursing advanced credentials in CrossFit may use these courses for required continuing-education credits, but the courses are open to anyone interested.

5. Read and study everything related to training, movement and health. The CrossFit Journal is a great place to start and is free to everyone. It covers material from all the seminars and provides examples, opinions and practical experiences from some of the best trainers in the community.

6. Do not be afraid to step outside the CrossFit community for educational opportunities. It can helpful to see how others teach, change mechanics and program. Even if a coach is training specialists, it is likely aspects of his or her methodology will be applicable to CrossFit clients.
7. Study CrossFit.com. The archives (since 2001) contain years of original CrossFit programming. It is a great resource for learning and experimenting with workouts.

Furthering one's education will also help in preparation for obtaining additional credentials, such as the Certified CrossFit Trainer (Level 3) and Certified CrossFit Coach (Level 4). More information about these certifications can be found here. The CrossFit Coach credential is the preeminent trainer designation offered by CrossFit: the goal of this evaluation is to provide a distinction for expert coaches within the community.

**CrossFit Community And Representation**

Many participants at the Level 1 Certificate Course view their Seminar Staff trainers as “CrossFit” or CrossFit ambassadors. While the Seminar Staff are CrossFit ambassadors, the most important ambassadors are those participants who go on to become CrossFit trainers in the community. CrossFit trainers working at the affiliate level touch and change lives every day.

CrossFit hopes that these trainers care and protect the community as they would care and protect anything they value and respect. This would be reflected in adhering to guidelines presented in Responsible Training, specifically with respect for all individuals. True experts never stop learning and never try to overstep the scope of their knowledge. Clients have entrusted their health to CrossFit trainers, and it is the trainer’s responsibility to make safeguard and improve the health of all clients.

Much of what is now part of the CrossFit community was suggested by the community members and then implemented by CrossFit to bring more quality training to more people. The CrossFit.com website, the CrossFit Journal and even the Level 1 Certificate Course were all launched after suggestions from the community. The goal of CrossFit has always been to favorably affect more people with CrossFit training, and each of these resources has the power to do just that. CrossFit wants its trainers to be a vibrant and engaged addition to the community. The CrossFit Certification and Training Department encourages each member of the community to attend courses and events, to pursue higher levels of credentials and to provide feedback. Level 1 Certificate Course participants are asked to provide feedback upon completion of the course, but anyone can write to coursefeedback@crossfit.com at any time with feedback.

Thousands of CrossFit trainers have used the Level 1 Certificate Course as a springboard to their coaching career. New trainers should use the material gained from the Level 1 Course and this Training Guide and slowly apply it to others, incrementally increasing their scope over time. Fitness can be improved throughout a lifetime, and so too can coaching. An expert coach prides himself or herself on a commitment to continually pursuing virtuosity in the interests of improving the health and performance of all clients.
Fundamentals, Virtuosity, and Mastery:
An Open Letter to CrossFit Trainers

In gymnastics, completing a routine without error will not get you a perfect score, the 10.0—only a 9.7. To get the last three tenths of a point, you must demonstrate “risk, originality, and virtuosity” as well as make no mistakes in execution of the routine.

Risk is simply executing a movement that is likely to be missed or botched; originality is a movement or combination of movements unique to the athlete—a move or sequence not seen before. Understandably, novice gymnasts love to demonstrate risk and originality, for both are dramatic, fun, and awe inspiring—especially among the athletes themselves, although audiences are less likely to be aware when either is demonstrated.

Virtuosity, though, is a different beast altogether. Virtuosity is defined in gymnastics as “performing the common uncommonly well.” Unlike risk and originality, virtuosity is elusive; supremely elusive. It is, however, readily recognized by audience as well as coach and athlete. But more importantly, more to my point, virtuosity is more than the requirement for that last tenth of a point; it is always the mark of true mastery (and of genius and beauty).

There is a compelling tendency among novices developing any skill or art, whether learning to play the violin, write poetry, or compete in gymnastics, to quickly move past the fundamentals and on to more elaborate, more sophisticated movements, skills, or techniques. This compulsion is the novice’s curse—the rush to originality and risk.

The novice’s curse is manifested as excessive adornment, silly creativity, weak fundamentals and, ultimately, marked lack of virtuosity and delayed mastery. If you have ever had the opportunity to be taught by the very best in any field you have likely been surprised at how simple, how fundamental, how basic the instruction was. The novice’s curse afflicts learner and teacher alike. Physical training is no different.

What will inevitably doom a physical training program and dilute a coach’s efficacy is a lack of commitment to fundamentals. We see this increasingly in both programming and supervising execution. Rarely now do we see prescribed the short, intense couplets or triplets that epitomize CrossFit programming. Rarely do trainers really nitpick the mechanics of fundamental movements.

I understand how this occurs. It is natural to want to teach people advanced and fancy movements. The urge to quickly move away from the basics and toward advanced movements arises out of the natural desire to entertain your client and impress him with your skills and knowledge.

What will inevitably doom a physical training program and dilute a coach’s efficacy is a lack of commitment to fundamentals.

But make no mistake: it is a sucker’s move. Teaching a snatch where there is not yet an overhead squat, teaching an overhead squat where there is not yet an air squat, is a colossal mistake. This rush to advancement increases the chance of injury, delays advancement and progress, and blunts the client’s rate of return on his efforts. In short, it retards his fitness.

If you insist on basics, really insist on them, your clients will immediately recognize that you are a master trainer. They will not be bored; they will be awed. I promise this. They will quickly come to recognize the potency of fundamentals. They will also advance in every measurable...
way past those not blessed to have a teacher so grounded and committed to basics.

Training will improve, clients will advance faster, and you will appear more experienced and professional and garner more respect if you simply recommit to the basics.

There is plenty of time within an hour session to warm up, practice a basic movement or skill or pursue a new personal record (PR) or max lift, discuss and critique the athletes’ efforts, and then pound out a tight little couplet or triplet utilizing these skills or just play. Play is important. Tire flipping, basketball, relay races, tag, Hooverball, and the like are essential to good programming, but they are seasoning–like salt, pepper, and oregano. They are not main courses.

CrossFit trainers have the tools to be the best trainers on Earth. I really believe that. But good enough never is, and we want that last tenth of a point, the whole 10.0. We want virtuosity!

Yours Truly
Professional Training

Originally published in January 2006

I am a fitness trainer. My practice is more than just a job; it is my passion. My clients are my top priority and their successes are my life’s work—I am a professional.

On the surface, my job is to shepherd my athletes (I view all my clients as athletes regardless of their age or ability) toward physical prowess, but I recognize a purpose to my efforts and an impact on my athletes that transcends the physical. I view training as a physical metaphor for habits and attitudes that foster success in all arenas. I stress that point to all who train with me and I know I have been successful only after they bring back concrete examples.

The lessons learned through physical training are unavoidable. The character traits required and developed through physical training are universally applicable to all endeavors. Perseverance, industry, sacrifice, self-control, integrity, honesty, and commitment are best and easiest learned in the gym. Even clients who have found spectacular success in business, sport, war, or love find their most important values buttressed, refined, and nourished in rigorous training.

Being a professional, I believe that my competency is solely determined by my efficacy. My methods must be second to none. Accordingly, fitness trends and fashions are distractions, not attractions. To the extent that my methods are often unconventional, unaccepted, or unique, they reflect the margins by which I dominate my industry, and I take those margins to the bank. A trainer who lusts for popular approval is chasing mediocrity or worse.

Committed to unrivaled efficacy, I have often had to develop new tools and methods. This cannot be done without study and experimentation; consequently, a lot of my work is done not in the gym but in books and scientific literature and in communication with other trainers and coaches.

My competency is determined by my efficacy, which is ultimately determined by my athletes’ performance—performance that must be measured. Competition, testing, and recordkeeping let me know the difference between merely looking or feeling good and actually being good at what I do.

My commitment to my athletes is clearly expressed and perceived in our first meeting. I am all theirs. They are the object of my focus and the focus of my conversation. They come back not because of my physical capacity but because they believe in my capacity to develop theirs. World-class athletes rarely make world-class trainers.

I understand that the modern and near-universal trend of skill-less and low-skill programming delivers inferior results and makes cheerleaders of trainers. I will have none of it. I have to understand the mechanics, cues, and techniques of complex movements and to be able to teach them to
Professional Training, continued

Our friendship, the fun we have, and the frequency of our contact, coupled with the scope of fitness’s impact and the technical merits of my training, contribute to a professional relationship with my clients that they value uniquely.

If a trainer’s clients are not testing the limits of his knowledge, he is not doing a good enough job with them.

In appreciation, they do all my marketing. I do not advertise, promote, or market. I train very, very well. The more clients I get, the more clients they bring. I do not have time for promotion; I am too busy training.

Because I want my clients’ training experience to transcend the physical realm, I am obligated to understand their jobs, hobbies, families, and goals. Motivating clients to transcend fitness requires that I be involved in their lives. This is not going to happen without my being both interested in them and interesting to them.

Being a voracious reader of books, newspapers, and magazines, I have no shortage of conversation, ideas, and knowledge to share, and so you will find me at my clients’ parties, weddings, and family gatherings. Indeed, I am a personal friend to nearly every one of my clients. This is extremely gratifying work and often emotionally charged, but that is all right because I am an integral part of my athlete’s lives, and life is full of laughter, tears, and hope.
Scaling Professional Training

Originally published in January 2006

The standards expressed in “Professional Training”—unyielding commitment to client and efficacy—have guided everything that we have done. More than just the backbone of CrossFit’s strength and successes, it has been, we believe, the primary reason for our success.

Using this template, we built a practice that kept us both busy from roughly 5:00 to 10:00 a.m., Monday through Saturday. That schedule produced a low-six-figure income, which is really amazing given that we got to work together, with our friends, having a positive impact on people’s lives, and keep afternoons free for family, recreation, and study.

Training with the attention and commitment that we bring to our practice, though fun and immensely rewarding, is also draining, and five appointments per day is about all we could handle without an unacceptable drop in energy, focus, and, consequently, professional standards.

Eventually, the demand for our training exceeded the time we were professionally able or willing to allot. In an effort to accommodate more athletes, we began to hold group classes.

We had used group classes to train some of our athletic teams and everyone loved them, trainers and athletes alike. The social dynamic of group classes is extremely powerful. Run correctly, they motivate an athletic output that is only rarely matched in one-on-one training. The competition and camaraderie of the group classes motivated our line “men will die for points” and the recognition that CrossFit is “the sport of fitness.”

Group classes also dramatically increase training revenues!

There are, however, two drawbacks to group classes. The first is space—more athletes require more space to train, but, fortunately, the space required to train 10 people is not 10 times that required for one, and space adequate for one athlete can serve three or four athletes well.

The second drawback is that the reduced trainer-to-trainee ratio can dilute the professional training standards that we have embraced. This natural dilution can, however, be compensated for by the trainer’s development of a skill set that is only very rarely found.

To run group classes without compromising our hallmark laser focus and commitment to the athlete, the trainer has to learn to give each member of the group the impression that he is getting all the attention that he could get in one-on-one training, and that requires tremendous training skill.

We have seen this skill fully and adequately developed by only one path: gradually migrating from one-on-one to group sessions. The trainers who are running group classes without growing into them are typically not working to the professional training standards that we have described. They also seem to have an inordinate difficulty filling their classes.

This is exactly how we built our group classes. After working for years at the limit of our one-on-one capacity, we started accepting new clients by doubling them up with other one-on-one clients to form one-on-two appointments.

We introduced the shift to group classes by telling the existing one-on-one clients that we had good news for them: “Your training rate is going to go down and we’re going to introduce you to a new friend.” Where there was resistance to sharing the time we asked for a trial period. It went swimmingly well.

We structured payment so that a client who was paying, say, $75 per session would now be paying only $50. This drives the trainer’s hourly revenue up and reduces the clients’ costs per session. This prompted many to come
more often. When our schedules filled and it became necessary to bring a third person to each group, we brought the individual rate to $40 per session, and again the trainer’s hourly rose and the client’s costs fell. With the addition of each new athlete to the session, the rates fall for the athlete and rise for the trainer, and it all works perfectly unless there’s a perceived reduction in attention.

All the demands on the trainer skyrocket in this situation however. Attention, enthusiasm, voice projection, and engagement all have to escalate. It is an acquired skill—an art, really. Our goal is too give so much attention and “in your face” presence to each participant that each is actually grateful that he did not get more attention. The essential shift is that the level of scrutiny and criticism is ratcheted up along with the rate of praise and input for each client. The trainer becomes extremely busy. There is no way a new trainer can walk into this environment and do well. (Imagine the decline in standards for those trainers who are participating in their classes while trying to lead them. We see this too often, and the training is always substandard.)

Within two years we had morphed our one-on-one practice to all group classes without increasing the number of hours we worked each week, although we both kept a couple of choice one-on-one clients. We charged $15 per class and averaged 10 to 15 athletes per session.

This substantially raised our income. It also gave a much-noticed boost to the stability of our practice. Seasonal fluctuations due to summer and Christmas vacations largely disappeared. With a one-on-one practice, when three clients you see two or three times per week are, by coincidence, on vacation simultaneously, income takes a hit. Not so with group classes.

At the same time we started converting our practice from one-on-one to group classes we launched CrossFit.com. The launch of the website was motivated by the same commitment to client and efficacy that motivated our training. We were looking not to increase our revenues but to favorably impact more people with our training. The difference may seem inconsequential, but the public clearly knows the difference.

The group classes, the website, this journal, our seminars, and our affiliate program were all introduced to bring more quality training to more people. Each of these additions also increased CrossFit’s value for everyone involved. It was our original one-on-one clients who initially came to and benefited from the group classes, subscribed to the journal, visited the website, and attended the seminars. Every CrossFit expansion has served the entire community.

We are in pursuit not of money but of excellence. The difference, we believe, is the difference between success and failure. The pursuit of excellence is the heart of our business plan.

Money is, for many, elusive because markets are unknowable. But while markets are unknowable, excellence is obvious to most everyone, especially free, and large, markets.

If you can accept the three premises that:

1. markets are largely unknowable
2. excellence is obvious to everyone, and
3. free markets reward excellence

It becomes obvious that the most effective business plan comes from achieving excellence and letting the market bring the money to you. The efficiency and effectiveness of this paradigm is breathtaking.

We have used the pursuit of excellence to guide our every move. For instance, when we were considering the last expansion of CrossFit Santa Cruz we could not determine whether it would be financially feasible or not. The variables were too numerous and the assumptions too uncertain to convince any accountant of the wisdom of expansion, but when we asked the simple question, “Will it improve the quality of the programming and the training experience?” the answer was a resounding “Yes!” On expansion, the CrossFit Santa Cruz numbers tripled within six months and the extra space allowed for some refinements and additions to our programming that would not have been possible otherwise.

As our seminars, journal, website, and affiliate program grew, we handed off the group classes to a new generation of CrossFit trainers who now cover most of the overhead costs of CrossFit Santa Cruz. This has afforded us time and opportunity to commit more energy and resources to new projects that support and develop the CrossFit community.
In order to register for the Level 1 Certificate Course, you must agree to the Trainer License Agreement. Be sure to read it thoroughly to gain a clear understanding of what is permitted and prohibited as a CrossFit Level 1 Trainer (CF-L1). If you engage in any activity prohibited in the Agreement, it is possible that you may be sued, lose your Level 1 Trainer Certificate, and/or have your application denied when you apply for CrossFit Affiliation.

This document is to provide a summary in laymen’s terms, although you are responsible for everything in the original Trainer License Agreement. To begin with, we must distinguish between the CrossFit methodology, and the CrossFit brand name.

**The CrossFit™ methodology is free.** It has been available on [CrossFit.com](http://CrossFit.com) every day for more than a decade, and free for the world to use personally.

**The CrossFit™ brand name is not free to use.** Even with an L1 Trainer Certificate (i.e., even if you passed the Level 1 test), you cannot use the CrossFit brand name to advertise, market, promote, or solicit business or service in any way. If you do, your Trainer Certificate can be revoked, you may get sued, and you may be denied Affiliation.

To obtain a license to advertise and promote CrossFit training, you must affiliate. Affiliation is described in detail [here](https://www.crossfit.com). If you passed the Level 1 test, you may list “CrossFit Level 1 Trainer” or “CF-L1 Trainer” on your resume, business card, or biography of a website. That is it. Nothing more is permitted regarding use of the CrossFit brand name. You can train yourself, teach your friends for free, introduce the methodology to others, and wear a CrossFit T-shirt proudly, but you cannot use the CrossFit brand name or CrossFit copyrighted material to describe what you do or to market your goods and services. Additionally, you cannot re-package the method, rephrase the articulation, and label it as your creation. That would be plagiarism; not only is it wrong, but it is copyright infringement.

Our legal department aggressively pursues any unlicensed use of the CrossFit brand name and CrossFit copyrighted material everywhere in the world. If you are unsure of the appropriate use of the CrossFit brand name, please contact affiliatesupport@crossfit.com, or hire a lawyer. To report suspected unlicensed use of the CrossFit brand name, send an email to iptheft@crossfit.com.
Can I teach CrossFit classes with a Level 1 Certificate?
If you are at an existing affiliate, a CrossFit-L1 trainer may teach CrossFit classes.
If you are not at an existing affiliate, such as at a commercial gym, you may certainly use what you have learned, but you may not call it CrossFit or use the CrossFit trademarks in any way.

If I am a CrossFit L1 Trainer, can I advertise or market training similar to CrossFit without using the CrossFit name?
As a CrossFit L1 Trainer, you may use the CrossFit methodology and you may train people on your own, but only affiliation entitles you to use the CrossFit trademark to describe your own programming.

If I am a CrossFit L1 Trainer, can I tell my clients we are doing CrossFit without advertising it in any written or marketing materials?
No. Word-of-mouth marketing of CrossFit training is not permitted without first becoming an affiliate. As a CrossFit L1 Trainer, you may use the CrossFit methodology and you may train people on your own, but only affiliation entitles you to use the CrossFit trademark to describe your own programming, even by word of mouth.

If I hold a CrossFit Level 1 Certificate but do not work at an affiliate, how can I promote that I do CrossFit training without opening a gym?
A personal trainer with a Level 1 Certificate who trains clients in non-affiliate locations (e.g., at their homes, commercial gyms) cannot use the CrossFit trademark without becoming an affiliate. See above.

Is it acceptable to advertise CrossFit training if I am a trainer at an existing affiliate?
Yes, if you work at an existing affiliate and hold a Level 1 Certificate, the affiliate may advertise CrossFit branded training, and you may advertise that you are a CrossFit trainer at that affiliate.

What does obtaining a Level 1 Certificate afford an individual beyond a designation?
Obtaining a Level 1 Certificate affords the trainer the right to be listed in the CrossFit Trainer Directory, an online database for the public to locate CrossFit trainers. The Level 1 Certificate also is a pre-requisite for trainers to legitimately use Subject Matter Experts (SME) certificates and material to train others in those specialties (e.g., “CrossFit Gymnastics Trainer”).

What does obtaining a Level 1 Certificate afford an individual for furthering their education?
The Level 1 Certificate is a pre-requisite for more advanced CrossFit Courses, such as Levels 2 through 4 (see figure on the next page). It is also necessary to use the “Trainer” designation with SME courses. See above.
Click here to learn more about CrossFit’s credentials.