

# Starting Strength

## Strength Training, CrossFit and “Functional Training”

by

Mark Rippetoe

Strength, as you already know, is the ability to exert force on physical objects. Skill is the learned ability to carry out a task within a definable framework of time and energy. Neither of these physical characteristics can be developed through methods that employ the constant variation of stress stimuli, because neither strength nor skill can develop under infrequent exposure to the stresses that cause the adaptation.

Like learning to play the piano, their acquisition must be *accumulated* in a logical, methodical manner. Not all exercise systems are equally proficient at developing strength and skill. As it turns out, strength training with barbells combined with practice of the sports skill is the best way to develop both.

Now that seems reasonable enough, right? You get both stronger and better at your sport over time, by training for strength and practicing your skills. So why are the two biggest players in the fitness industry telling you otherwise?

### Strength: The Basis of Physical Interaction

Strength is simply the production of force with your muscles. Producing force is the way we interact with the environment – anything you move with your hands and feet, from climbing the stairs to picking up the groceries, involves the application of force. It is the most important physical attribute we possess. You may have the healthiest heart and lungs on the planet, but if you’re not strong enough to get out of a chair without help, your daily activities are less pleasant than they could be.

There is only one kind of strength: the kind your contracting muscles generate to move your skeleton, a system of levers that multiplies the force your muscles produce when they get shorter. Muscles moving your skeleton allow you to walk, run, climb, work, and exist efficiently as a physical human being. The loss of strength is a normal consequence of aging, but it can also occur due to illness or inactivity. Whatever the cause, a profound loss of strength produces a diminished quality of life.

Likewise, the best way to increase physical performance is to increase your strength. *Strength training* is the process of getting stronger through the use of specific exercises that cause the body to

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adapt to gradually increasing amounts of force production. Barbell training is the most effective way to accomplish this process, because the exercises are performed using the body’s natural movement patterns while standing on the ground, the natural position for a bipedal animal.

Since standing on the ground with a bar in your hands or on your back while you move the load requires that you don’t fall down, balance develops as strength increases. Barbells can be precisely loaded to gradually increase the amount of weight you lift, and strength can be accumulated on the basic exercises for years.

Since strength is simply force production against a load, if your loaded movement increases in weight, so does your strength. Getting stronger is simply the process of becoming capable of lifting increasingly heavier weights. The key to strength training is the process of gradually increasing the load in a way that allows the body to adapt to the stress of heavier weights. At first these increases can take place frequently, twice or three times per week, and then the process gradually slows as you accumulate more strength. But it’s important to understand that training is the *process* of forcing this adaptation to occur, that if *strength* is to increase the loads *must* increase, that the process takes time, and that any interruption slows the process.

### **Skill: Dependent on Strength**

We are told that many other physical attributes are just as important as strength. Balance, coordination, endurance, agility, power, and speed – the elements of physical *skill* – are all characteristics of the good athlete, and therefore must also be trained. But since all of these physical parameters are derivatives of force production against external resistance, they all depend on, *and are limited by*, strength.

Skill is the learned ability to carry out a task within a definable framework of time and energy. It’s the ability to correctly and dependably reproduce a movement pattern that depends on accuracy and precision.

Whether the sport involves a repetitive motor pathway – the same movement pattern under varying conditions of time, load, or intensity, like Olympic weightlifting or the field throwing events – or a non-repetitive motor pathway, like downhill skiing or judo, skill is the demonstration of the ability to perform the movement patterns effectively, conforming to the requirements for success in the sport

Complex gymnastic movements, the Olympic lifts – like the snatch and the clean and jerk, Olympic weightlifting movements that are sensitive to the path of the barbell through space – and sports that require proficiency must be *practiced* – repeated often enough to permit technical perfection. This requires many hours to hone movement patterns that tolerate very little slop. Expertise in many endeavors that depend on physical skill, like musicianship, surgery, sculpture, and golf, require thousands of hours of exposure to the movement patterns. Skill-dependent athletics develop the same way.



Sports that require significant force-production capacity differ from golf and musicianship, in that strength acts as a limiter on the acquisition and display of skill. If the movement patterns that must be perfected also depend upon strength for their execution, then strength must be sufficient or execution cannot occur. If you’re not strong enough to perform a Maltese cross, your skill at doing so can be neither developed nor displayed.

## **Performance: The Display of Strength and Skill**

Game Day is the day that matters to an athlete. Game Day is when the cumulative effects of training and practice are displayed under the conditions for which the athlete has devoted time and energy to bring to the highest level possible.

Game Day is a *performance*, the execution of the sport under the pressure of competition with other athletes, and under the scrutiny of judges or referees, each trying to “win” – which may involve different criteria depending on the sport, the season, or the status of the athlete. But no matter what “winning” means, a performance is a higher-level event than the training workouts and the practices that contribute to its success. The component workouts of a training program are important insofar as they contribute to the process of reaching the training goal, as are the practice sessions that perfect the skills used in the sport.



The performance is where the culmination of these processes is displayed. A workout or a practice contributes to the performance, and the performance is the reason we train and practice.

Two main players in the modern fitness industry have managed to elevate the misunderstanding of these simple concepts to the institutional level.

## **CrossFit**

CrossFit is the fastest-growing fitness trend in human history. As of mid-2014, CrossFit has about 10,000 affiliate gyms around the world. Started by Greg Glassman in the early 2000s, CrossFit’s model is perpetual variation in exercise selection and loading. He described it as a “constantly varied, if not random” assortment of barbell exercises, calisthenics, gymnastics movements, and running, usually performed at high levels of intensity. For many people, CrossFit has been their first exposure to physical activity that is hard enough to make an actual increase in fitness possible.

The object is to push for the best performance every time, quite often defined as reducing the time it takes to complete a prescribe series of movements, and the theory is that these constantly varied and often *infrequent* exposures to a wide variety of physical stimulus will accumulate into improved performance in all these activities.

CrossFit is very popular for several reasons. It’s not boring. Since it’s done in a group setting, with someone else – either the gym’s coaches or CrossFit’s main website – determining the Workout of the Day, you don’t have to decide what to do. CrossFit decides for you, and this appeals to many people for various reasons. The group social reinforcement of the collective goal for that day’s workout builds a sense of community, and this also appeals to many people. And it works pretty well, for a while.

The problem with CrossFit is the constant variation. Having worked with CrossFitters since 2006 and having done it myself for 2 years, my experience agrees with the almost-universal report from people who begin CrossFit and continue their constant variation of exercises for 6 months: their strength stopped increasing and all the exercises that depend on skilled execution suffer from a lack of practice.

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Not every CrossFit gym has these problems, because not every CrossFit gym follows the CrossFit dogma, and there are some very good people who own CrossFit gyms that have actively addressed the situation. But the exceptions prove the point:

*When movements that depend on high levels of force production and the accurate and precise execution of a complex movement pattern are performed to exhaustion or failure in the competitive atmosphere of a highly-motivated group of people of different levels of ability, the possibility of injury increases.* It should be quite obvious to anyone that the harder you push yourself physically, as happens in a competition, the higher the risk of physical injury. And this is especially true in the absence of the adequate preparation that should be provided by effective strength training and repetitive practice.

Coaches can disagree on which movements to use, but the simple reality is that ***the acquisition of both strength and skill is not a function of variation.*** It cannot be, because variation prevents the conditions necessary for the adaptations that make it possible. As anyone who has learned to play the piano can tell you, the processes must be repeated often – *on a keyboard* – with constant, regularly increasing levels of difficulty and ever-greater attention to detail. Strength and skill are both acquired through the diligent pursuit of more weight on the bar and more perfect movement execution, both of which must be performed repeatedly in a logical consistent manner. Infrequent exposure to skill-dependent movements under performance circumstances is the *polar opposite* of the method used in athletics, and everything else, to develop strength, accuracy, precision, and excellence of execution.

CrossFit also places a major emphasis on high-intensity, constantly-varied conditioning work, in a competitive atmosphere that rewards a faster performance or more work within a given period of time. This results in a lot of soreness and accumulated fatigue, an effect that many CrossFitters come to identify as “the prize” for doing the program. The intensity and volume of high-repetition conditioning exercises actively competes for the body’s most assuredly finite recovery capacity, effectively *preventing* a strength adaptation. Chronic soreness is a systemic inflammatory condition that makes skill-dependent movements more difficult to learn, because soreness interferes with flexibility and range of motion.

Not everyone wants to excel in competitive sports, but the competitive aspects of CrossFit keep even non-athletes motivated to keep coming. However, the emphasis on a competitive approach to a non-competitive fitness-exerciser’s workout – in which complex movements are employed which are neither practiced or trained for – certainly exposes unprepared people to injury risks they may not recognize.

## **“Functional Training” The Bastard Child of Strength & Conditioning**

Almost as pervasive as CrossFit is the interesting trend known within the industry as “functional training.” An offshoot of Physical Therapy rehabilitation techniques used with patients, it relies on the use of light weights, unstable surfaces, and lots of different unilateral exercises to produce better results than the machine-based programs commonly used in the fitness industry.

Many people have grasped the problems with machine-based exercise, which involve the lack of normal human movement patterning and the absence of a *balance* component during the use of equipment you sit on or in. Machines force the body to use the machine’s path of movement, not yours, and using an isolated muscle group to move the lever of a machine removes the important balance component – not falling down – as a training variable. “Functional” training is a misplaced

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overreaction to exercise machines, an attempt to restore the balance variable to the exercises. But in the process of doing so, a couple of serious mistakes have been made.

First, they forgot about barbells. If your primary interest is improving upon machine training, that’s just not very hard to do. *It is possible to fall down* when you lift barbells while standing on the floor. It is important to learn *not* to fall down when you squat, press, and deadlift, and everybody learns how the first day they do the movements. From that point forward, not falling down is a factor that is always present, but it is not the bottleneck. The ability to produce enough force to lift the increasingly heavier barbell – getting stronger – is the objective, and not falling down is just *normal*. Not falling down is merely a problem you have already solved; not falling down is not sufficiently difficult that it prevents your getting stronger.

Second, making balance the primary variable in the exercise precludes the use of enough weight to drive a strength increase. Single-leg squats on a wobble board or alternate dumbbell presses while seated on a balance ball cannot be done with as much weight as their stable parent exercises, performed on both feet on a stable surface. If the components of the program consist almost entirely of relatively light weights moved with one hand at a time while solving a complex balance problem on one leg at a time, while varying the exercises every workout,



“functional training” removes the production of progressively higher amounts of force as even an option, and replaces it with *not falling down* as the primary objective. If force production against the load is not the limiting factor, strength as a long-term adaptation cannot be achieved.

Third, one of the unfortunate reasons “functional training” has become popular is that unilateral dumbbell exercises using light weights and a balance variable are very easy to coach – much easier than technique-dependent loaded movement patterns such as squats, deadlifts, presses, cleans, and snatches. This may bias an inexperienced coach towards their use when they are not appropriate, since easy pays the bills just like hard does, especially if the trainees don’t complain. The fewer the number of joints working in a movement pattern, the fewer the joints that can move incorrectly in that movement, and the easier the movement is to coach.

A leg extension, for example, is pretty damned easy to supervise, while a snatch requires quite a bit of both personal and coaching experience to teach. Bulgarian split squats are down on the leg-extension end of the spectrum, because the range of motion is short, the load is light, the load doesn’t move very far, and because it’s light and short, the motion of the load is not the technical aspect of the exercise.

And if physical skill is the objective of “functional training,” developing it on wobble boards, bosu balls, and other contrived circumstances in the gym ignores the fact that skill is exquisitely context-dependent. One practices hockey skills on the ice, basketball on the court, football and baseball on the field, Olympic weightlifting on the platform, with the tools of the trade, the tools used on Performance Day. A tennis swing does not apply to baseball, or even to racquetball. A softball pitch does not prepare you for a baseball pitch. These things are obvious to anyone who has played them.

A skilled wobble board squat with a light barbell may look impressive on the internet, but it cannot translate to a skilled field performance in an actual sport, because it is so specific that it does not transfer, and it is so light that it did not make you stronger. It was a waste of time for the athlete, but it looks impressive to parents and uninformed Head Coaches.

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Strength is a general adaptation which transfers to every sport– again, this is why steroids are popular. The most effective way to get the strongest is the best way to use training time. Skill is specific to the sport, and functional training is neither a sport nor an effective way to get strong. It is the Bastard Child of strength and conditioning, and it must be stopped.

### **Strength and Skill Must Accumulate**

The most functional physical attribute is strength. Increased strength means the increased ability to produce force, which requires the use of progressively heavier weights. Increased strength also makes skill easier to acquire and display. Any effective approach to strength and skill must involve repeated, gradually increasing exposures to both, because both require repeated effort to accumulate. Sorry, but neither constant variation nor light weights are a shortcut.

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