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Using Workload to Move to the Next Strength Level

Bill Starr says a logbook and a calculator can help you avoid strength plateaus and keep your numbers marching upward.

By Bill Starr

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Mike Warkentin/CrossFit Journal

Everyone who has ever embarked on a strength program eventually comes face-to-face with a problem: how to move to the next strength level.

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A credible coach is most valuable in these situations, but the truth of the matter is not many of these are available, which means that the individual has to figure out the solution on his own. I had been weight training and even competed in Olympic meets for almost five years before I encountered my first coach, Sid Henry, a national heavy-weight champion at the Dallas, Texas, YMCA.

So prior to meeting Sid and learning a mountain of information from him, I was on my own, and I made most of the same mistakes other beginners make. Nearly all the lifters who started out in that same period related similar stories. We all learned through trial and error and used intuitive training, even though none of us understood what that term meant at the time.

All went quite well for a while—then my gains hit the wall.

Starting out with a balanced routine where all the major muscle groups are given equal attention helps, and that's what I did. My purpose behind lifting weights was to get bigger and stronger so I could perform better in a wide variety of sports activities. The improvement in my physique was a nice side benefit, but the real reason I lifted was to become a more proficient athlete.



Take the time to log your workouts. Accurate records are an invaluable resource.

My only guide for exercise selection was the manual I received from George Jowett when I sent away for his courses. I couldn't do any of the exercises he described because I didn't have access to any weights, but I recalled them when I came across my first weight room in the gym at Great Lakes Naval Training Center in 1955. I knew that if I wanted to get bigger and stronger, I needed to focus on the larger muscles groups, so my program consisted of back squats, power cleans, overhead presses and, later on, jerks. I also did ab work and something for my biceps and triceps because, like any teenager, I wanted impressive upper arms.

I trained two or three times a week, depending on my duties, and I got results. I gained a goodly amount of body weight and even grew two inches, so I was happy. I did the sets and reps that George had mentioned in his manual: 3 sets of 10 on everything, except the auxiliary work for my arms. Those exercises I did for a couple of sets of slightly higher reps.

After I finished medical-corpsman school and was assigned to West Palm Beach Air Force Base, I began experimenting with different set and rep formulas. I began trying lower reps: 5s, 3s and singles to see how my body would respond. When I did the lower reps, I did a few more sets, usually 5 or 6. It worked well and I got a bit stronger, although I wasn't setting the weightlifting world on fire by any stretch of the imagination.

Then I discovered the Olympic lifts and began revolving my routines around them. All went quite well for a while—then my gains hit the wall.

Word Hard, Work Smart

There was no one I could turn to for advice. The five others who trained with me knew less than I did. If I wanted to move to the next strength level, I would have to figure out how on my own. My first thought was that I was doing too much, so I cut back on the number of exercises I was doing in a workout. That made matters worse, so I reversed the procedure and added in yet more work. That didn't work either.

I stumbled on the solution accidentally. I had had a really good session on Monday, where I broke my clean-and-jerk record. On Wednesday, I decided to see if I could improve on that lift once again. I failed miserably, not even coming close to what I did on Monday. Disgusted with myself, I left the gym without finishing my usual session. On Friday, I was determined to at least equal what I did on the previous Monday, and I did—with ease.

I was confused and spent a great deal of time pondering what had happened,

Then it dawned on me: that light session in the middle of the week provided me with sufficient rest to have a strong workout on Friday. So I began doing a less difficult workout after a hard one, and at the third workout for the week, I would do more than I did on Wednesday but slightly less than what I had lifted on Monday. I was usually more tired on Friday anyway. Unknowingly, I was using the heavy, light, and medium system in a rough form.

Later on, when I started training with Sid, I learned the smaller points about this system that had been around since the early '30s. It was the brainchild of one of the pioneers of weight training, Alan Calvert, publisher of *Strength Magazine* and several books on the subject of strength and fitness. He also owned Milo Barbell Company. The system had a huge impact on the way I trained. I used it throughout my Olympic-lifting and powerlifting career and still employ it in my high-rep routine. It has proven most valuable to me as a strength coach and is one of the very first things I teach my athletes. I believe that it's absolutely essential to incorporate the heavy, light and medium concept into every program if that athlete wants to continually make progress. (I've gone into this system in more detail in the *CrossFit Journal* article [Heavy, Light and Medium](#).)

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And for a strength athlete to be able to move from beginner to intermediate and from intermediate to advanced, he must also utilize the concept of workload; that is, how much total tonnage has been moved in a session and in a week and month. No one taught me this; it just made sense. If I wanted to improve leg strength, I had to work them harder. Same for all the other muscle groups, and those that were the most difficult to get to respond had to be given even more direct attention. In addition, any strength gains had to be matched with the other groups to prevent having glaring weak areas.



Mike Markentin/CrossFit Journal

Which barbell you lift on which day will have a great effect on your overall gains.

When I was at York Barbell, I kept a record of all my workouts and used those to plan my future routines. Yet it wasn't done systematically. I went by how I felt more than just the raw numbers. I knew it was a bit hit or miss. Tony Garcy, the outstanding middleweight from El Paso, Texas, helped me clarify how to use workload. Tony used what was then referred to as "the European method," which consisted of figuring out to the pound how much weight was moved in a workout. These numbers were then used in conjunction with the heavy, light and medium concept to keep from falling into the trap of chronic overtraining. At one session at York Barbell, Tony handled an amazing 35,000 lb. Russ Knipp, who trained at York prior to the '66 Seniors and North Americans, upped this a notch to 36,000 lb. Bob Bednarski never bothered calculating his load, but it had to be in that same range.

At that stage, I didn't calculate my workload either. I was more intuitive. When I felt sluggish, I backed off. Lots of juice, I did more—but I believe I would have been more successful had I followed Garcy's example. It was later on when I started training sports teams that I began to understand how important it was to know exactly what every athlete was handling in the weight room at each workout.

The reason why most people do not utilize workload and a strict adherence to the heavy, light and medium system is they're lazy. It takes time to write down every set and how many reps were done with a certain amount of weight and then to do the math and chart those numbers so that you have a clear picture of what you lifted in a week or month. It's worth the effort.



Choose wisely for optimum training.

When I'm coaching an athlete, I insist that he keep a training log of what he does in the weight room at every workout. Then I use that as my guide to tell him what to do at the next session. Once he reaches the high intermediate level, I have him start calculating workload. It's simple math, yet it takes time to do the figuring and later on the charting. But I have found, without exception, that when an athlete starts figuring his workload, he invariably gets stronger than those who do not. Part of this is due to the fact that as he does the homework, he is mentally recalling his entire workout—what exercises went well and which ones were very difficult, as well as how he did on the high-skill movements like full snatches and clean and jerks.

Once the numbers are set down on paper, there's a lot that you can do with them to help you determine what to do for the remainder of that week or month. It's important for you to record the numbers soon after you've finished the session. Most people think they can remember clearly what they did a few days later, but they can't. Not even my pre-med students at Hopkins could do that. Some like to set the numbers down on paper or in their training log during the workout, while others prefer to wait until later on that night to do the math. But it needs to be done on the same day as the workout or some lifts will slip through the cracks and not get recorded.

Doing the Digits

"Workload" refers to the total amount of weight you lifted in a day, week and month. It's also called "volume," and intensity is also part of the total scheme of things. When I first start an athlete on keeping an accurate record of workload, I don't bother with intensity. This is because I

work lower reps into my entire program on a consistent basis, so that base is pretty well covered. Once you have everything on paper, it's rather easy to glance over the workouts and see if you are hitting some triples, doubles and singles on the exercises that need more intensity.

To obtain the amount of work you have done on an exercise, multiply the weight used by the number of reps you did, and add all your sets together. For instance, on his heavy day, our sample lifter back squatted with: 135, 225, 295, 345 and 375 for 5 reps. In addition, he did one back-off set of 8 with 295. The workload for the squat comes to 9,215 lb., and he did that in 33 reps. Not everyone is interested in the total rep count, but some are, so go ahead and record it.

Now follow that same procedure for all the other exercises in your program for that day, including the auxiliary movements for the smaller groups. At the end of the week, you'll end up with a lot of numbers beside all the exercises you did that week.

Next, make three columns for your three major muscle groups: shoulder girdle (or upper body), back and hips/legs. Put the numbers for the primary movements in the appropriate columns. I still want to include the amount of work done on the smaller groups, but I don't want them in the same columns as the primary work. I put the numbers for the ancillary movements in brackets right next to the columns for the primary work. I want the auxiliary work to be included in the overall total for the three groups, but if you throw them in with the primary exercises, it distorts what you have done.

For example, our lifter who back-squatted 375 for 5 also did 395 for 3 on his medium day and front-squatted 315 for 3 on his light day. His yield for the squats for the week is right at 25,000 lb. He also did calf raises twice that week because this is a weak area he is trying to improve. He used 200 lb. for 3 sets of 30. Times two that comes to 36,000 lb.—over 10,000 lb. more than what he moved in the squats. It's misleading because calf raises, even when they're pushed to the eye-crossing stage, just aren't as demanding as front and back squats.

Place the numbers for the calf raises in brackets right next to the hip/legs column along with any other auxiliary work you did for your legs. Do the same thing at the bottom of the columns so that at the end of the week you can see at a glance where your increases came from. That way you can separate apples from oranges.



Calculating volume requires commitment, but it will give you a lot of essential information you can use to plan future sessions.

Do the same thing for the shoulder girdle and back. Overhead presses, jerks, bench presses, inclines and weighted dips go in the primary column. Lateral and frontal raises, straight-arm pullovers, triceps pushdowns, curls, and any forearm work go in brackets. For the back, reverse back hypsers and regular back hypsers are auxiliary movements, and just about any other back exercise can be considered primary.

Combo movement needs special attention. When you clean a bar and then press or jerk it, you should have numbers for your back and more numbers for your shoulders. If you clean 200 lb. and press it five times, you get credit for 200 for your back and 1,000 for your shoulder girdle. Should you clean 200 three times and jerk it twice, that's 600 for your back and 400 for your upper body.

Finally, what about those free-hand movements, such as chins, free dips and even push-ups? They are definitely a part of the program, and the work needs to be included in the grand total. But what number should be used to multiply by the number of reps done? Body weight or some arbitrary figure? It doesn't matter; be consistent. These freehand exercises belong in their own category for the same reason auxiliary movements are separated from the primary lifts. I put them in parentheses. Then you can spot them right away when you study your weekly totals.

What the Numbers Tell You

Once you do the math, you have absolute proof of how much total work you are doing in a given week or month. I had a football player at Hopkins who converted his chart to a bar graph. These raw numbers will reveal a great many things. They will tell you if you are working the large muscles hard enough to influence gains. Are the three columns in balance or is one body part way out of whack? While there is no hard and fast rule to determine which body part should be receiving the most attention, if someone is trying to get considerably stronger so he can play some sport at a higher level, the back and legs should be close together, with the shoulder girdle coming in third spot. Of course, a great deal depends on what you're trying to accomplish. In a sport such as wrestling, the upper body is involved to a much greater extent than it is in basketball or soccer.

What most discover rather quickly is that they're doing more exercises and workload for their shoulder girdle than they are for their back and legs. This is often due to the fascination our culture has for the bench press. Some programs I've seen done in gyms are half for the upper body and half for the back and legs.

The numbers don't lie. Many actually believe that they're doing a well-balanced program to help them gain strength or to improve their Olympic lifts, but when they fill in all the columns at the end of the week, they discover they're not even close. Adjustments need to be made right away.

Eventually it comes down to who works the hardest in the weight room—and this is determined by your workload.

Another thing that workload reveals is how much total work you're doing in a given week and month. This gives you a solid benchmark from which to proceed. Our sample lifter does his homework and finds that he is moving just under 50,000 lb. a week, with a favorable portion of that coming from hip and leg work. That's his starting point.

He's strength training for football and is able to squat 395 for 3, power-clean 225 for 5 and incline-press 255 for 5. He's also doing good mornings, high pulls, shrugs, flat and overhead presses, weighted dips, and front squats. The only way he's going to improve those numbers is to expand the workload for those muscle groups involved in those exercises. The top-end lifts are entirely dependent on the base. A pyramid cannot be raised any higher than what the base will support. This is a truism in architecture and in strength training as well. Want to squat 425? Then the grunt work has to be done to make the base wider. There are no shortcuts, other than improving technique, but eventually it comes down to who works the hardest in the weight room—and this is determined by your workload.

"No problem," you might be thinking. "I'll just add in a few more sets on the primary stuff, couple more back-off sets, and maybe two or three more exercises per workout. Then I could add a day or try two-a-days."

Unfortunately, it doesn't work like that. Expanding the workload takes time. It cannot be hurried. Your body has to be able to recover from the extra work, and if you push the deal, you'll find yourself going in the wrong direction because you're going to become chronically overtrained.

Every significant increase in workload must be accompanied with a modification in your rest habits and diet. More work requires more rest or you will not be able to recover from the stress. Likewise, your body needs more fuel if you're going to be pushing the numbers higher and higher, and that basically translates to a lot more protein in your daily diet.

Of course, there are some strength athletes who are able to move at a faster pace than others, but eventually even those gifted individuals encounter the hard truth that they must proceed more deliberately. But it has never bothered me that gains must come slowly. A great many of the lifters I trained with who were genetically blessed in that regard usually dropped out when the going got tough. Norbert Schemansky once said that all a lifter had to do to become a national champion was just put 10 lb. on his total every year and lift long enough.



Staff/CrossFit Journal

Understanding how volume, intensity, rest and diet affect you can help you reach the highest levels of sport.



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Different loads affect athletes differently, but accurate records give each a chance to analyze training and improve future workouts.

Tonnage is to the strength athlete what mileage is to the long-distance runner. During the period of my life when I was still running 10 miles a week, I read many of the articles in running magazines. A fact that stuck out was that those training for a marathon only increased their monthly mileage by 10 percent. More than that and they would start to regress. So I applied that same thinking to workload and it fits nicely.

That means an athlete who is handling 50,000 lb. a week should only increase his monthly total by 5,000 lb. While this may not sound like much, it is because if you do that over the course of a full year the improvement is considerable. In truth, very few can make that sort of improvement.

Also, when an athlete nears 70,000 lb. a week, he should ease off every other week and do a bit less, say 65,000 lb. Then the following week he can nudge his total up to

73,000 lb. That slight variation makes a world of difference and allows the athlete to continue forward without falling into the trap of overtraining.

And keep in mind that when you add in extra work in the form of more exercises, back-off sets and extra sessions, everything has to fit into the heavy, light and medium concept. Should you just pile on more and more work and disregard this principle, you will hit the wall quickly. The day that's the most abused is the light day, which in many ways is the most critical of all. Because it is the least taxing and the shortest as well, there is a tendency to slip in more and more exercises, usually of the auxiliary kind, yet when there are a lot of those, they add up rapidly. In many cases, I have found that the workload on the light day exceeds that of the medium day and even takes longer to complete than the heavy day.

That's where your numbers chart comes in handy. Just by scanning the various columns, you can tell if you are adhering to the heavy, light and medium principle. Should you decide to add another training day, make it a light-light day in the beginning. Want to try two-a-days? Make sure one is light. Some are aware that there are foreign Olympic lifters who do three-a-days. I wondered how they could get away with that, even though I knew they were very advanced strength athletes. Then I saw a workout where they front squatted three times a day. They used the heavy, light and medium system.

The light days are critical to recovery, and that is a key element in making progress in any sport. To get stronger, you have to push. The body only remains in a state of equilibrium for a very short period of time. Then it either moves forward or backward. So the body has to be worked a bit more every week if you want to make it stronger. The trick is to do this at a steady yet unhurried pace while at the same time spending hours perfecting your technique on all the exercises in your routine. For Olympic-lifting hopefuls, form work should nearly match pure strength work.

The body only remains in a state of equilibrium for a very short period of time. Then it either moves forward or backward. So the body has to be worked a bit more every week if you want to make it stronger.

At the same time, pay closer attention to nutrition. There's no doubt in my mind that every serious strength athlete needs to take mega-dosages of nearly all the supplements and make sure he's consuming at least a gram of protein for every pound of body weight, and that has to be done on a daily basis.

The first step is to go out and buy a notebook and start recording your workouts. Then chart them and learn how to incorporate the heavy, light and medium system into your weekly workouts. No one promised easy in regards to gaining strength. It takes a great deal more than just showing up at the gym three days a week. But, believe me, the extra time spent doing the math and charting your workload will bring surprising results.



Jody Foster

About the author

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