

# **SECTION 1**

**BASIC PRINCIPLES & THEIR  
APPLICATION TO TRAINING**

## 1.1: BASIC PRINCIPLES

The program outlined in this book and the methods used to execute it work. Period. After over twenty years in the field of strength and conditioning, I've been able to test, refine, and implement a training methodology that gets results (28 Big Ten/WCHA titles, seven national championships, and over 375 All-Americans in numerous different sports). Now, don't get me wrong—I'm not saying that I'm responsible for or that my training methods are responsible for all those accolades. The accolades are due to two things—great recruitment efforts on the coaches' part and great work ethic on the athletes' part. I've been lucky to work with groups of very athletically gifted, dedicated young men and women. Conversely, because I've been fortunate to consistently work with such high caliber athletes year after year, it has allowed me to formulate, implement, tweak, and refine a system of training that gets results.

This system, and its success, is based on a set of three principles that I've adopted and stick with when writing programs for my athletes. These are 1) stress the human body, 2) stress it often, and 3) stress it differently each time. To accomplish all three, you have to be a little creative. The ultimate purpose of this book is to teach you how and when to apply different methods of stress with your athletes to not only improve performance but engage the athletes and get them excited about training.

## 1.2: STRESS, STRESS, STRESS!

If the athlete isn't being physically stressed, you're wasting your time. I honestly believe that. This philosophy—one of constantly applying stress to the human body—is the single most important component of any training program. Let me say it again—you must *constantly* be stressing the athlete. I was lucky because early in my own playing career as a wrestler and football player at Findlay College in Ohio, I was exposed to literature and training methods that showed me the value of stress and its initial negative, though eventually positive, effects on performance (more on that in a minute). Since my playing days, I've continued to learn everything I can about programming and training the human body to perform at its highest levels. I've looked at and dissected every successful training program I could get my hands on (and by “successful,” I mean world record setting), and they've all had one common theme—high levels of stress.

Taking those early lessons about stress that I learned at Findlay and combining them with what I've learned since through research and experimentation, I'm convinced that stress is the essential factor that must be a constant in athletes' training in order for them to maximize their athletic potential. That said, this isn't a book about stress. It's a book about how a coach should apply stress to the athlete to maximize performance. Yes, I'll discuss triphasic muscle action, undulation, the block system, and a host of other things, but you have to realize that these are all different methods of applying stress to the human body. Before a coach can effectively apply these methods to elicit performance benefits for an athletic population, a coach needs to have a firm grasp on the foundations on which those methods are built. Specifically, in this case, a coach must understand stress—its cause and effect relationship on the human body and how that relationship influences adaptations that improve sport performance.

Stress and the human body's mechanisms to cope with it are amazing things. Stress is caused by anything and everything the human body encounters. From the bumps you feel while driving to work in your car to the apprehension you feel on a first date to the sheer terror of stumbling across a grizzly bear in the woods, stress is your body's way of interpreting and cataloging the

world around you. The idea of stress as an all-encompassing stimulus was first presented as the general adaptation syndrome (GAS) by Dr. Hans Selye in the 1950s.<sup>1</sup> Often referred to as the “Grandfather of Stress,” Selye discovered that everyone interprets the world around them through stress.

By definition, GAS is the manifestation of stress in the human body as it builds over time. What this means is that stress isn't a single, isolated event. It must be thought of as a fluid stimulus that the human body must constantly deal with. Think of stress as a wave. When you're in the valley, you're experiencing low levels of stress. When you're at a peak, you're experiencing high levels of stress. The important thing to understand is that regardless of your place on the wave, you're always under stress.

Selye understood the interaction between stress and the body to be a battle to reach homeostasis.

The human body doesn't like change, which is why it doesn't like stress. Stress is the signal to the body that something has to change, something must adapt to reduce the amount of stress exerted by that stressor on the body if it were to come across it a second time. If the stressor is large enough, it triggers adaptation. The brain will then signal the body, through hormonal response, to adapt to that stressor. The body's thinking is that while it doesn't want to change, it is better off adapting to the stress so that if encountered a second time, it will be dealt with by the new mechanisms put in place for its facilitation and not have any negative effects on the body.

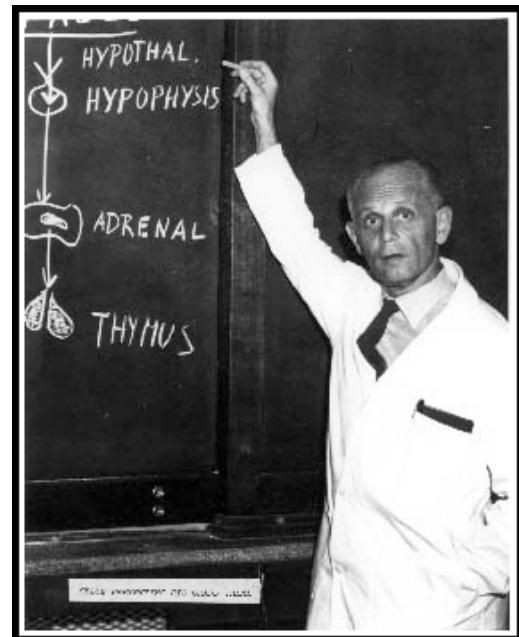


IMAGE 1.1 - HANS SELYE

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<sup>1</sup> Image 1: Used with permission from Steve Berczi and the *Hans Selye Institute*.

Think about this in terms of running because it is both the easiest and most relatable example. Imagine you haven't been out for a run for several months. Maybe you live in Minnesota like I do and outdoor running is difficult from January through March. Anyway, you go out for a run. The next morning you roll out of bed and almost fall over. Your feet are killing you, your quads are on fire, and your lower back feels like you slept on a concrete floor. After a brief analysis of the situation, you conclude that you're getting old and incredibly out of shape, but you're pretty sure that it won't kill you if you go run again. This process continues for a week or so. Each time you wake up, you're a little less sore than the previous day even though the number of miles you ran each subsequent time increased. Why? The simple and clear answer might seem to be that you're in better shape, but that isn't the real reason "why." The real reason is because your body has adapted to a new stressor—running. During the first run, your body was screaming at you, "What the \$@!\*% are you doing?!?!?" Your body had adapted to a state of homeostasis that didn't involve running. It was happy. By throwing in a new stressor, it forced the body to adapt, to change, so that the next time you went running, it said, "Oh, this again? I knew this was coming. It's easy." The human body is lazy and wants to be kept in the nice warm blanket of homeostasis as much as possible. As a strength coach, you need to rip that blanket off and dump a bucket of ice water over it to stimulate adaptation!

Entire volumes of books have been written on GAS and its implications since Selye first published his work over a half century ago, none of which I will go into here. For the purposes of strength and conditioning, as well as understanding the undulating model, you only need to understand how it pertains to athletic performance. Selye broke down GAS into three stages—alarm reaction, resistance, and exhaustion. Let's take a moment to examine each stage more closely as it pertains to an athlete.

1) **Alarm reaction** (workout): This is the athlete's "fight or flight" response. A strong training stimuli, elicited by workloads of high stress, mobilizes the athlete's energy resources in amounts that far exceed the metabolic level necessary for homeostatic response. It can also be thought of as an immediate, or acute, training effect that leads to the degradation of muscle

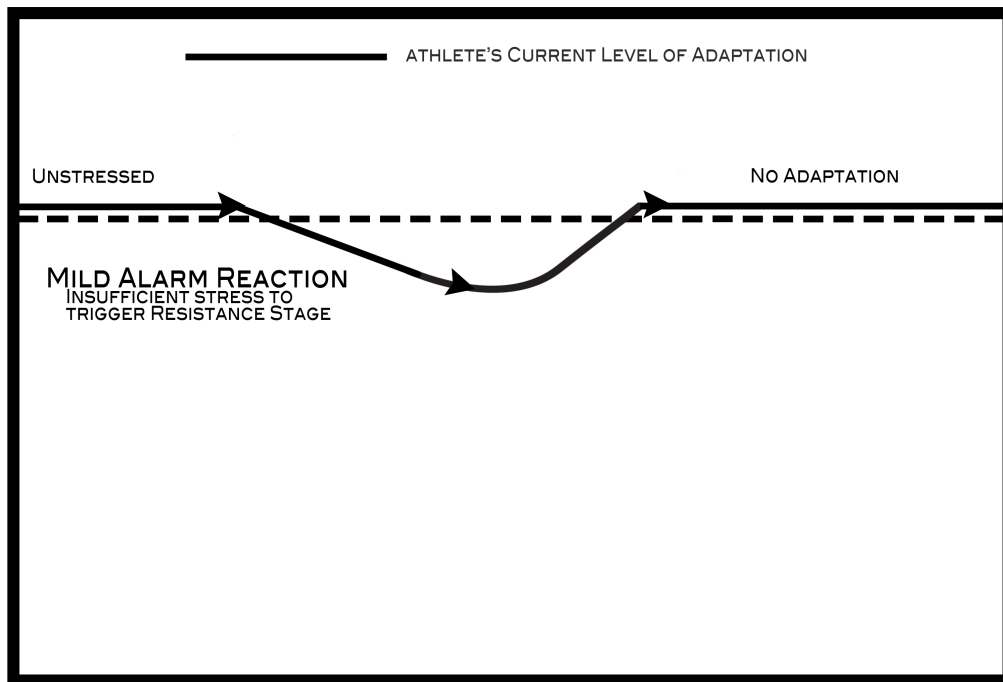
tissue and energy substrates. These increased demands trigger profound endocrine responses (i.e. the secretion of stress hormones such as cortisol, epinephrine, and norepinephrine, as well as human growth hormone (HGH)). This is a catabolic response.

- 2) **Resistance** (recovery): This stage begins after the workout and is the body's attempt to return to homeostasis, repairing the damage from the workout through an insulin response (repairing muscle damage and refilling glycogen stores). This is the anabolic stage. Stress hormone levels will return to normal but only if given sufficient time to dissipate. If another stressor returns before the athlete has completely recovered, the athlete will experience another alarm stage response, pushing him deeper into a catabolic state.
- 3) **Exhaustion** (severe overtraining): This stage is defined by very high levels of stress for the athlete. Other terms used to express this stage are overload, burnout, or adrenal fatigue. In this state, an athlete's endocrine system begins to shut down, as it is no longer able to keep up with the high stress loads placed on it. An athlete in this state will often have a deficient thyroid (low metabolism or constantly tired), severely impaired immune system, elevated cortisol levels, disturbed sleep patterns, and an inhibited insulin response. This stage is associated with decreased sport performance.

When you put the three GAS phases together along with an understanding of the physiological response they stimulate, you'll find that there are three possible results from training.

- 1) Low-grade stress that produces a mild alarm reaction response. This doesn't result in any positive adaptation because the training stimuli or workloads weren't stressful enough to upset the athlete's homeostatic balance by triggering a resistance stage response. These workouts are pointless and waste valuable training time.

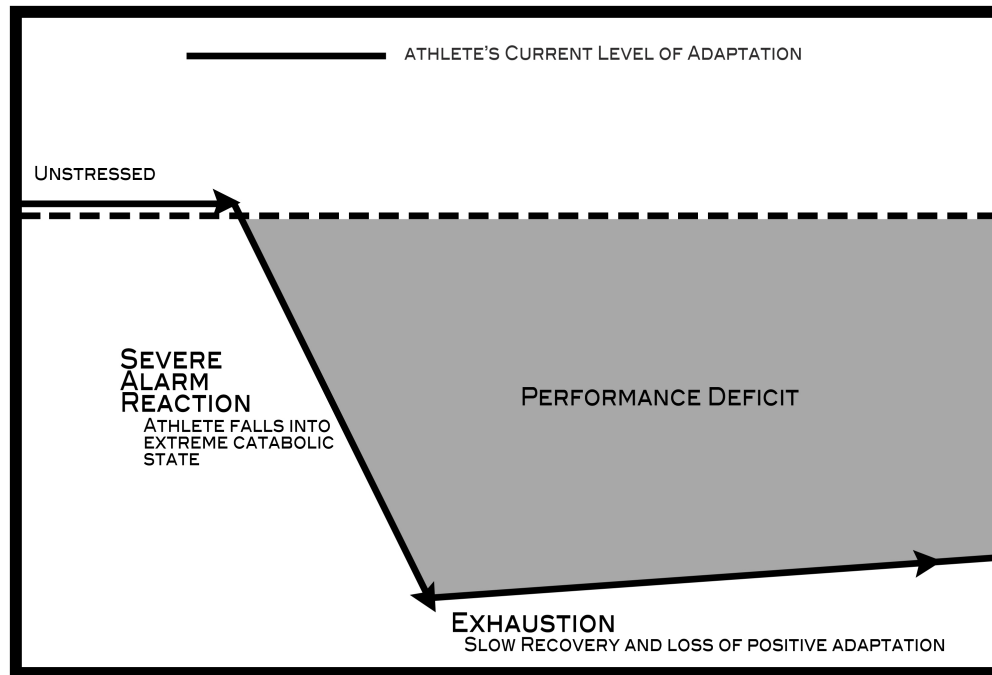
## GENERAL ADAPTATION SYNDROME (UNDERTRAINED ATHLETE)



**Figure 1.1:** Undertrained athlete—workout doesn't provide sufficient stress to trigger a resistance stage (anabolic) response. Doesn't result in any positive adaptation.

2) Long bouts of high-grade stress usually applied over a period of months or even years. Here the stress of numerous workouts compounds itself. Before the athlete's body can begin to build itself back up through the resistance stage, another stressor is applied that pushes the body into a deeper catabolic state. The athlete's body isn't given sufficient time to recover to its previous level of adaptation before another stressor is applied. If more and more stress is applied without adequate time given for recovery, the athlete falls further and further down the proverbial cliff, eventually reaching the bottom of the canyon. Classified as severe overtraining, this consists of extreme exhaustion as well as mental, neural, and adrenal fatigue. If an athlete is allowed to reach this point, it can take months, or even years, to climb back out.

## GENERAL ADAPTATION SYNDROME (OVERTRAINED ATHLETE)

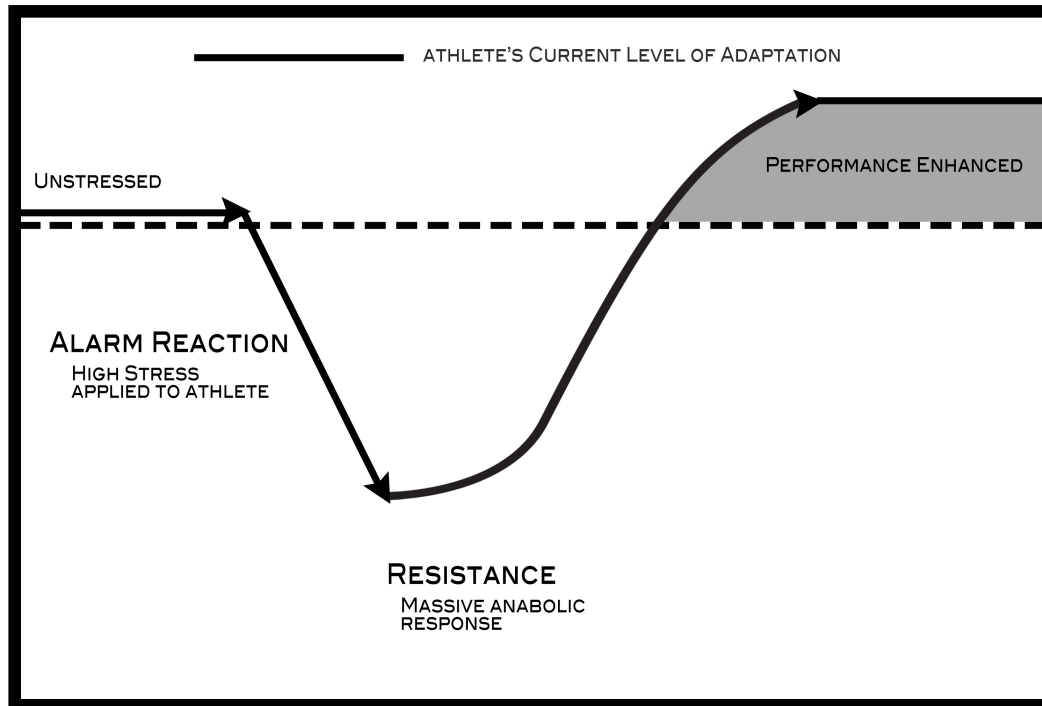


**Figure 1.2:** Overtrained athlete—excessive stress with little to no recovery time pushes the athlete into an extreme catabolic state or exhaustion. Also known as overtraining, this type of stress pattern produces a performance deficit and can take months, or years, to recover from.

- 3) Short bouts of exposure to high-grade stress usually applied over a period of weeks or months produces an alarm reaction response, signaling a massive, catabolic hormonal release. This, in turn, forces the body into the resistance stage, where it begins to rebuild the damaged tissue and refill metabolic stores. The result of these workouts is a *supercompensation* by the athlete's body, improving subsequent performance. Here, the athlete isn't allowed to fall all the way to the bottom of the canyon. Halfway down, additional stress (workouts) is stopped, and the athlete's physiological system begins to climb back up and recover.



## GENERAL ADAPTATION SYNDROME (SUPER COMPENSATED ATHLETE)



**Figure 1.3:** Supercompensated athlete—proper application of high-grade stress causes a severe alarm reaction and hormonal release within the athlete. This, in turn, signals a massive resistance stage response, turning the athlete anabolic and leading to positive adaptation.

Where most coaches fail their athletes is in their fear of overtraining them. When coaches think of overtraining, they often think of it only in its most severe form, as outlined by stage three of Seley's GAS—exhaustion. They are so afraid of producing results like the one in option two (see graph) that they never stress their athletes hard enough to see a full supercompensation response. While severely overtraining an athlete will have extremely negative effects on an athlete's performance, a more mild dose of overtraining, known as overreaching, will yield drastic improvements.

Overreaching is characterized by training to a point of fatigue that begins to show performance decrements and overtraining symptoms within the athlete. These symptoms can last anywhere from a few days to several weeks. Exposure to high bouts of stress, when given adequate time to recover, can lead to a delayed training effect, resulting in resynthesis of the damaged muscle

tissue and depleted energy substrates to a level above and beyond their previous state. This phenomenon is known as supercompensation.

Overreaching will force the athlete's body to adapt to higher levels of stress than normally obtained by less stressful alarm/reaction cycles. In this case, the athlete's body interprets the extreme stress load as a life-threatening stimulus. The body literally believes it could endure severe injury or even death if it encountered that same level of stress a second time. As a result, the body and its physiological mechanisms go into overdrive to rebuild bigger and stronger than before and make sure that when it meets that level of stress again, it won't just survive but will thrive!

*“Only when standing at the brink of destruction does  
man truly realize his potential.”*

— ANCIENT SAMURAI MAXIM

Clearly, you must not *severely* overtrain your athletes. However, as I just pointed out, you must overreach them to maximize their performance gains. How does a coach know how far and how hard to push an athlete? That is where the art of coaching and a solid understanding of stress and its application come into play. As a coach, you must not severely overtrain your athletes, throwing them over the proverbial cliff. They will never be able to climb back out. Instead, you need to tie a rope around their waist and throw them over, only letting them fall halfway down. Great coaches are the ones who know how far they can let an athlete fall and still have enough strength to climb back out. Be careful though—once you get good at this, you might not recognize the athletes as they climb back over the lip of the cliff. The athletes you threw over the edge won't be the same ones that climb back out. They will be bigger, stronger, and more powerful than before.

In a sense, there should never be anything fun about a workout, at least not from a physiological perspective. Sure, workouts can be fun in nature—competitive, rowdy, and energized. However, each workout should make your body think that you're trying to kill it. To progress, an athlete's body must constantly be introduced to new, more intense stressors.

A strength coach is a stress manager. In looking at the three possible outcomes stress can cause in an athlete, there is a fine line between spurring positive adaptation and overtraining an athlete to the point of severe physiological damage and performance deficit. Stress is a double-edged sword. It can build an athlete into a dominating force or it can cut him down to an inferior shell of his former self. The strength coach's most important job is learning how to wield that sword to constantly spur positive adaptation. The subsequent sections of this chapter not only show you how to stress the athlete on a daily basis—explaining the volumes, loads, and intensities that should be used—but also how an athlete must be stressed on a weekly (undulating) and monthly (block system) scale.

## 1.3: FIVE FACTORS FOR SUCCESS

Understanding that stress is *the* critical component, the question then becomes, “How much stress does an athlete need to maximize performance?” Where is that magic tipping point between undertraining and overtraining an athlete? As I said before, I’ve researched every world-class caliber program I could find. After much searching, referencing, and translating (some of the programs I obtained were in Russian and French!), I found the answer—a lot! Coaches too often are afraid of severely overtraining athletes. They never stress them hard enough or push them long enough to truly realize their potential. Whether it was cross country, Olympic weightlifting, swimming, powerlifting, throwing, sprinting, or any other sport for that matter, the programs that produced the best results applied the most stress. In looking at these programs and the world-class athletes they produced, I realized that there were five key factors in every program:

- 1) **High volume:** The total weight lifted per session or workout
- 2) **High intensity:** The percentage of an athlete’s maximum lift during a workout
- 3) **High frequency:** The number of times the athlete trains per week
- 4) **High expectations:** The expectations of the athlete (missed workouts, skipped sets, or failed reps are unacceptable)
- 5) **Overreaching:** The point the athlete is pushed to but not past (adrenal fatigue)

This isn’t to say that all five factors were present all the time in every workout. That would be suicidal! These guys were just crazy. Each program blended and combined two or three of these five qualities, cycling them throughout the training year or macro-cycle. When one form of stress began to lose its novelty on the athlete’s system (the athlete’s body begins to interpret what was formerly a high level of stress as the new level of homeostasis), the coach cycled in a new high-level stressor to spur further positive adaptation.

Let me give you an example of one such program. The Bulgarian National Olympic Weightlifting team was a dynasty during the 1970s. In the 1972 Olympics, the Bulgarian team dominated the competition by taking three gold and three silver medals, leaving the world and favored Soviet Union scratching their heads as to the reason for Bulgaria's success. To put this in perspective for you, the Soviet Union, at the time considered the world's best in this event, covered an area roughly two and a half times the size of the United States and had a population of over 200 million people. Bulgaria, on the other hand, was a country half the size of the state of Minnesota, with a population of about 3.5 million people. It was David versus Goliath, and David dominated.

Going into the games, the Soviet Union was expected to sweep the medal board in the Olympic weightlifting events. Meanwhile, the Bulgarians were relative unknowns on the world stage. The embarrassing loss to the Bulgarians forced the Soviets to rethink their entire methodology of training their athletes. In studying the Bulgarian method of training, the Soviets came to the following conclusion, noted in an issue of the *Soviet Sports Review* in 1974:

*“The main reason for the better results is the substantial increase in the training load volume to a degree never used in international lifting practice to this time. Indeed, Bulgarian trainers draw on Soviet experience. For example, their means and methods of training are the same that we have in our country. But, Bulgarian athletes have substantially increased their training load in recent years.”*<sup>2</sup>

There are two important points to take from the above excerpt. First, the Bulgarians weren't doing anything revolutionary. They didn't have a super secret training protocol or new methods that enabled them to surpass the Soviets. Everyone was doing the same thing. Second, the Soviets concluded that Bulgaria's success was “substantial increases in training load and volume to a degree never used in international lifting competition.” The truth was the Bulgarians were outworking everyone else. They were stressing the human body to a level higher than anyone thought possible.

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<sup>2</sup> Roman RA (1974). The training of Bulgarian weightlifters. *Soviet Sports Review* 1:41–42.

Table 1 summarizes the comparison of the two teams and their training protocol going into the 1972 Olympics.<sup>3</sup> As you can see, the Bulgarians lifted higher volumes, heavier percentage loads, and more often than the Soviet athletes.

<b>TABLE 1.1: SOVIET UNION VS. BULGARIAN WEIGHTLIFTING PROGRAM (BASED ON 106KG LIFTER)</b>		
	<b>SOVIET UNION</b>	<b>BULGARIA</b>
<b>VOLUME (LIFTS/MONTH)</b>	1,000	1,500
<b>LOAD (TONS/MONTH)</b>	106	135
<b>WORKOUTS (PER WEEK)</b>	4	15

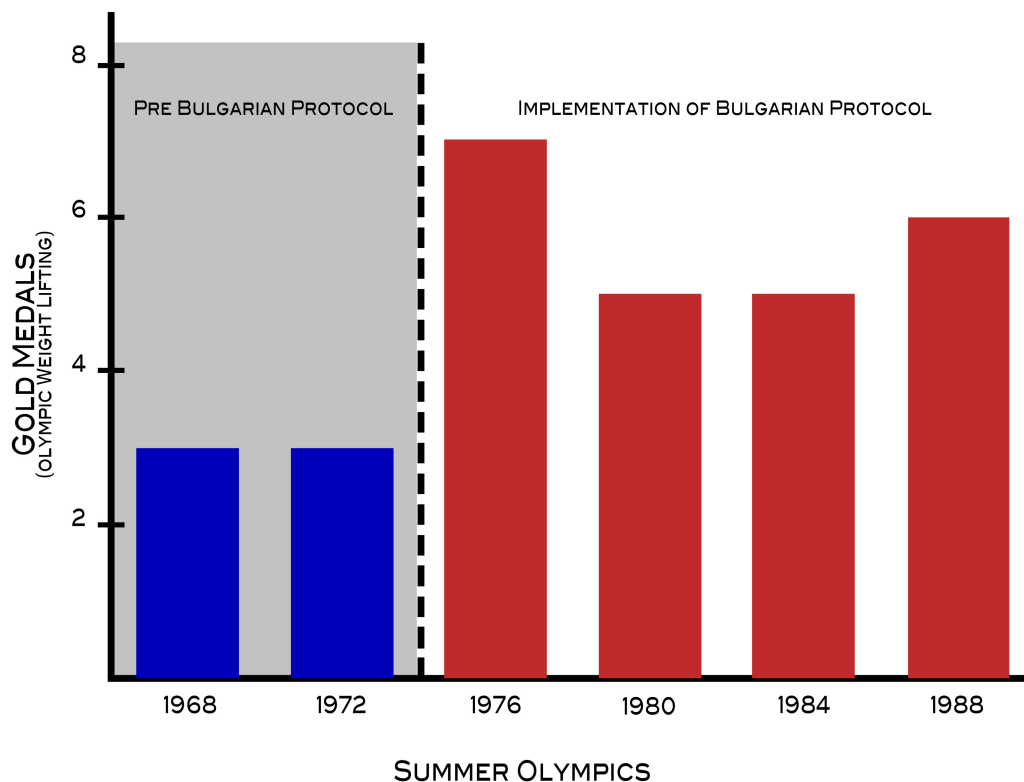
When the Soviet analysis was completed in early 1974, they instantly changed their training protocol to resemble that of the Bulgarians. What were the results? In the 1976 Olympic games, only two years after making the modifications to the program, the Soviets were back on top as a world power in Olympic weightlifting (winning seven gold medals), an event they would continue to dominate until the fall of the Soviet Union in 1991.

Interestingly, the Soviets decided to make similar modifications to the training protocols for many of their other Olympic sports teams including swimming, track and field, wrestling, and hockey. In the 1980 Summer Olympics, the Soviet Union won a record setting eighty gold medals. The next closest country was East Germany with forty-seven. In 1984, the Soviet Union boycotted the Olympic Games in Los Angeles, deciding instead to host their own Friendship Games in Moscow for all the Eastern Bloc Countries. Of the eighty-three gold medals won by the United States at the Los Angeles Olympics, over half of them would have been silver or bronze performances if they had competed against the Soviet athletes. Meanwhile, the Soviets did fairly well at their Friendship Games, winning 126 gold medals. The adaption of the

<sup>3</sup> Roman, R.A.; (1974). The training of bulgarian weightlifters. *Soviet Sports Review*, 1:41-42.

Bulgarian training method of high stress, high volume, and high intensity lifting turned the Soviet Union into a superpower until the dissolution of the Soviet Union in 1991, which divided up the team and resulted in severe budget cuts that made it impossible to continue such a rigorous training schedule for its athletes.

## GOLD MEDAL COUNT - SOVIET UNION



**Figure 1.4:** Graph depicting the number of gold medals won by the Soviet Union during the Summer Olympic Games before (blue bars) and after (red bars) implementation of Bulgarian lifting protocols.

Now, I'm not advocating the use of this specific type of training for high school or college athletes. A training protocol like the one used by the Bulgarian National Team is definitely outside the realm of NCAA regulations. I'm giving you an extreme example of the amazing capacities of the human body and how far it can be pushed with extreme levels of stress. While I don't think the same type of training should be used with most populations, I believe one hundred percent that the methods behind their approach are essential and will result in positive sport performance improvements in any population who chooses to adopt and apply them.

Just to give you a visual, at the end of this section you will find an example program that would have been followed by a Bulgarian Olympic lifter leading up to competition. If your jaw drops as you go over it, that's normal. I did the same thing when I first saw it. The workout consists of nine training sessions per day, four days a week, for a total of thirty-six weekly sessions. You heard me right. The lifter performs nine separate training sessions on Monday, Wednesday, Friday, and Saturday. Each session was to be completed by the lifter in under forty-five minutes without any more than ninety minutes to recover between each session. There is absolutely nothing fancy about this workout at all. There aren't any bands, chains, or fancy tempos. Just high volumes, high loads, and high frequency—high stress!

As a strength coach, you must learn to apply stress in a manner that elicits a supercompensation effect by overreaching if you want to maximize the performance of your athletes. Both high school and collegiate settings are ideal to implement these factors into a training program that can push an athlete to the brink. Due to the training time restrictions placed on teams imposed by the school calendar, it gives a strength coach specific mandatory blocks of time when the athletes must rest. During the school year, there are times when you don't have access to athletes (finals week, Christmas vacation, etc.). The goal of many of my training cycles is to overreach my athletes before they leave for break. That way, during training, I put their body through a maximal stress load, using the five factors to stress them before giving their bodies time to completely recover. As an example, my goal every May is to have as many of my hockey players sick with a cold or the flu going into finals week. I know that sounds terrible, but a sick athlete is an early warning sign of an overtrained athlete. When athletes are severely stressed and overtrained, their immune system is compromised and they get sick. During finals, there is a ten-day period when I'm not allowed to train the hockey players at all. Therefore, I overreach them going into finals (they are tired, sick, and miserable). Coming out of finals, however, when they get back to training ten days later, it isn't uncommon to see twenty- to thirty-pound increases in most of their major lifts as well as faster sprint times.



**TABLE 1.2: BULGARIAN NATIONAL OLYMPIC TEAM TRAINING PROGRAM**

SESSION 1	SESSION 2	SESSION 3	SESSION 4	SESSION 5	SESSION 6	SESSION 7	SESSION 8	SESSION 9												
SET 1 30% X 2 SET 2 38% X 2 SET 3 42% X 1 SET 4 54% X 1 SET 5 63% X 1 SET 6 70% X 1 SET 7 88% X 1 SET 8 96% X 2 SET 9 98% X 1 SET 10 96% X 1 SET 11 96% X 1 SET 12 92% X 2 SET 13 92% X 2	9:15-10:00AM SNATCH	SET 1 30% X 2 SET 2 38% X 2 SET 3 50% X 2 SET 4 56% X 1 SET 5 69% X 1 SET 6 75% X 1 SET 7 81% X 1 SET 8 91% X 1 SET 9 86% X 1 SET 10 91% X 1 SET 11 81% X 2 SET 12 81% X 2	SET 1 38% X 1 SET 2 50% X 1 SET 3 56% X 1 SET 4 69% X 1 SET 5 75% X 1 SET 6 81% X 1 SET 7 84% X 1 SET 8 88% X 1 SET 9 84% X 1 SET 10 88% X 1 SET 11 84% X 1 SET 12 88% X 1 SET 13 81% X 1	2:00-2:45PM FRONT SQUAT	SET 1 30% X 2 SET 2 38% X 2 SET 3 42% X 1 SET 4 54% X 1 SET 5 63% X 1 SET 6 70% X 1 SET 7 88% X 1 SET 8 96% X 2 SET 9 98% X 1 SET 10 96% X 1 SET 11 96% X 1 SET 12 92% X 2 SET 13 92% X 2	11:45-12:30PM SNATCH	SET 1 36% X 1 SET 2 46% X 1 SET 3 46% X 1 SET 4 56% X 1 SET 5 67% X 1 SET 6 77% X 1 SET 7 82% X 1 SET 8 87% X 1 SET 9 87% X 1 SET 10 92% X 1 SET 11 97% X 1 SET 12 100% X 1 SET 13 95% X 1 SET 14 100% X 1 SET 15 97% X 1 SET 16 95% X 1 SET 17 95% X 1	7:00-7:45PM SNATCH	SET 1 44% X 2 SET 2 50% X 2 SET 3 56% X 1 SET 4 69% X 1 SET 5 75% X 1 SET 6 81% X 1 SET 7 88% X 1 SET 8 91% X 1 SET 9 94% X 1 SET 10 91% X 1 SET 11 94% X 1 SET 12 88% X 1 SET 13 88% X 1	3:30-4:15PM SNATCH	SET 1 38% X 1 SET 2 38% X 1 SET 3 44% X 1 SET 4 44% X 1 SET 5 50% X 1 SET 6 56% X 1 SET 7 69% X 1 SET 8 75% X 1 SET 9 81% X 1 SET 10 86% X 1 SET 11 91% X 1 SET 12 94% X 1 SET 13 97% X 1 SET 14 94% X 1 SET 15 97% X 1 SET 16 94% X 1 SET 17 88% X 2 SET 18 88% X 2	8:15-9:00PM SNATCH	SET 1 36% X 2 SET 2 46% X 2 SET 3 56% X 1 SET 4 67% X 1 SET 5 77% X 1 SET 6 82% X 1 SET 7 87% X 1 SET 8 92% X 1 SET 9 95% X 1 SET 10 97% X 1 SET 11 95% X 1 SET 12 97% X 1 SET 13 95% X 1 SET 14 92% X 1 SET 15 92% X 1	8:30-9:00AM BACK SQUAT	SET 1 30% X 2 SET 2 38% X 2 SET 3 50% X 2 SET 4 56% X 1 SET 5 69% X 1 SET 6 75% X 1 SET 7 81% X 1 SET 8 91% X 1 SET 9 86% X 1 SET 10 91% X 1 SET 11 81% X 2 SET 12 81% X 2	10:30-11:15AM CLEAN & JERK	SET 1 36% X 2 SET 2 46% X 2 SET 3 56% X 1 SET 4 67% X 1 SET 5 77% X 1 SET 6 87% X 1 SET 7 92% X 1 SET 8 97% X 1 SET 9 95% X 1 SET 10 97% X 1 SET 11 95% X 1 SET 12 97% X 1 SET 13 92% X 1	4:45-5:30PM CLEAN & JERK	SET 1 44% X 2 SET 2 50% X 2 SET 3 56% X 1 SET 4 69% X 1 SET 5 75% X 1 SET 6 81% X 1 SET 7 88% X 1 SET 8 91% X 1 SET 9 94% X 1 SET 10 91% X 1 SET 11 94% X 1 SET 12 88% X 1 SET 13 88% X 1	SET 1 36% X 2 SET 2 46% X 2 SET 3 56% X 1 SET 4 67% X 1 SET 5 77% X 1 SET 6 82% X 1 SET 7 87% X 1 SET 8 92% X 1 SET 9 95% X 1 SET 10 97% X 1 SET 11 95% X 1 SET 12 97% X 1 SET 13 95% X 1 SET 14 92% X 1 SET 15 92% X 1

## 1.4: RESULTS SPEAK LOUDER THAN WORDS

I base all my theories and methodologies in this book on things that are measurable. By comparing the methods employed in the weight room to the results in competition, it will become instantly apparent whether or not a specific training method or protocol has resulted in improved sport performance. You *must* measure and evaluate everything that you do as a strength and conditioning coach. Sports like track and field, swimming, and weightlifting allow you to consistently measure performance-based results so that you can evaluate the methods you applied, see their transferability (how efficiently the athlete's gains in an exercise transferred to his improvement during competition), and then implement those methods to other sports.

Throughout my coaching career, I've been very fortunate to have coached at a school with a track and field team. Some coaches may view this as more of a curse than a blessing because track usually has dozens of athletes all competing in different events with unique needs. Add in the fact that the track season seems to run twelve months a year with athletes needing to peak every other meet, and it can turn into a program writing nightmare! If you can get past all that, however, you will find that a track and field team is the single best place to develop and test training methods and programs that can then be applied to a much wider athletic base.

The great thing about track and field events is that they are all one hundred percent performance based. Everything in track and field is measurable—how far the discus flies or how fast the sprinter runs. From one competition to the next, the extent of each event stay the same (except for weather conditions in outdoor competitions). There is very little variability within the track model compared to skill-based anaerobic sports such as hockey or basketball where no two games are ever the same. Variability in these sports is very high and thus any direct training effect is lost. I'm not saying that you can't see improvement in an athlete's performance from a training program. What I'm saying is that there isn't any way to show, definitively, that those improvements can be attributed to training.

If a basketball team has a horrible regular season but goes on to win their conference tournament, beating two ranked teams and gaining an automatic bid to the NCAA tournament, a strength coach could pat himself on the back and attribute it to having peaked his athletes at the right time. I will concede that is a possibility, but what if I told you that the team was young and it took them the majority of the season to learn to play as a team? Or that two of the wins in the conference tournament came off half-court buzzer beaters? These are examples of the two biggest reasons why a strength coach can't evaluate the validity of a program from team-based anaerobic sports—teamwork and luck (printed in bold in the table 1.3). When you add those two variables into the equation, it completely discredits any correlations that could be drawn from your training methods. A thrower never gets lucky on a good throw. A high jumper doesn't rely on a teammate to give him a push off going over the bar. Both are the result of perfect technique gained through thousands of hours of practice and proper strength training methods.

<b>TABLE 1.3: THE VARIABILITY OF SPORT</b>			
	<b>TRACK AND FIELD</b>	<b>HOCKEY</b>	<b>BASKETBALL</b>
<b>OUTCOME MEASURE</b>	DISTANCE	WIN/LOSE	WIN/LOSE
<b>CONTROL VARIABLES</b>	STRENGTH POWER NERVOUS SYSTEM	STRENGTH POWER NERVOUS SYSTEM	STRENGTH POWER NERVOUS SYSTEM
<b>RANDOM VARIABLES</b>	TECHNIQUE WEATHER	TECHNIQUE ICE CONDITIONS AWARENESS GOALTENDING EXECUTION DEFENSE OFFENSE COACHING STRATEGY SHIFT STRENGTH LINE MATCHING SKILL OF COMPETITION <b>TEAMWORK</b> <b>LUCK</b>	TECHNIQUE PASSING DRIBBLING DEFENSE OFFENSE CLOCK MANAGEMENT COACHING STRATEGY INBOUNDING AWARENESS SKILL OF COMPETITION <b>TEAMWORK</b> <b>LUCK</b>

Table 1.3 shows all the variables that go into factoring the outcome measure of different sports. Notice that team sports, such as hockey and basketball have exceedingly more random variables (variability) in their outcome measure. This increased variability makes it hard to find correlation between training and performance.

By using the training methods outlined in this book, you're getting a leg up on the competition because the methods have been tried and measured at the highest levels of competition and proven to be reliable in delivering sport performance gains. While you, as a strength coach, will never be able to stand up and take credit for a conference championship or national title, you can take pride in knowing that the methods you used with your athletes undoubtedly aided in their success.

## 1.5: VARIATION IS KEY

Finally, a quick word about variation. A program that doesn't change is an ineffective program. It is imperative that the five factors discussed previously are constantly rotated through the training cycle. Again, the factors are:

- 1) **High volume**
- 2) **High intensity**
- 3) **High frequency**
- 4) **High expectations**
- 5) **Overreaching**

The first three factors (volume, intensity, and frequency) can all be adjusted by altering the loading parameters (changing exercises, the weight on the bar, the method of movement being applied, or the number of training sessions per week). Below in table 1.4 is one example using horizontal pressing that shows the large spectrum coaches have to pick from when choosing how to stress an athlete. This is not a complete list, and only shows some of the possible loading parameters for a horizontal pressing exercise, the combination of which make a lifting method.

<b>TABLE 1.4: LOADING FOR HORIZONTAL PRESSING VARIATIONS</b>			
<b>EXERCISE</b>	<b>LOAD ON BAR</b>	<b>METHOD OF MOVEMENT</b>	<b>FREQUENCY</b>
SUPINE BENCH PRESS	55%	ECCENTRIC	1 DAY/WEEK
INCLINE BENCH PRESS	60%	ISOMETRIC	2 DAY/WEEK
CLOSED GRIP BENCH PRESS	65%	CONCENTRIC	3 DAY/WEEK
DB BENCH PRESS	70%	REACTIVE	4 DAY/WEEK
INCLINE DB BENCH PRESS	75%	CHAINS	5 DAY/WEEK
DIPS	80%	BANDS	6 DAY/WEEK
	85%	WEIGHT	
	90%	RELEASERS	

Again, if the athletes aren't constantly being forced to adapt to stress, you're wasting their time. This isn't to be mistaken for simply returning to the previous stimuli. You must come up with novel ways to stimulate and stress your athletes to spur change and see performance improvements. This serves a dual purpose—it keeps the athletes interested and engaged in the training and continually pushes their bodies to adapt. No one likes to go to work every day and do the same old routine over and over.

Keep in mind that new or increased levels of stress must be given to the athlete all the time to see continued increases in training effect. When I speak about training effect, I'm referring to results from continued training such as an increase in the key performance measures needed to benefit the demands of an athlete's sport. An example for a football player would be an increase in the ten-yard dash or vertical jump.

## 1.6: SUMMARY AND REVIEW

At first, this may seem like a lot to keep track of. Stress is a very complicated task, especially when you realize that its application, modification, and implementation can have either beneficial effects or detrimental effects on athletic performance. Just look back at the horizontal pressing table with just six exercise variations per lift, eight different percentages that can be used to load them, and seven different methods with which the load can be moved (not counting the dozens of variations and ways these can be manipulated). That's over 330 ways you can perform one single compound exercise. And that's just choosing the exercise! We haven't even considered how heavy the load should be on the bar, the volume or total reps that should be lifted, or the frequency of times the athlete should perform that pressing movement per week. Are you concerned yet? You should be. It's a daunting task.

That, right there, is why I decided I needed to write this book—to create a format that would simplify the application of stress and the tri-phasic undulating block system. Remember—as a coach, you must be a stress manager. You not only need to know what tools are out there (bands, chains, eccentric loading, high volume), but you must also know how to use them to elicit the greatest possible training effect for your athletes.

You know the old proverb, “Give a man a fish, he eats for a day. Teach a man to fish, he eats for a lifetime.” I didn't want to just write a programming book for coaches to take and simply rip out programs and throw at their athletes. I want coaches to be able to understand and apply sound, knowledge-based training principles in the sincere effort to improve the performance of the men and women they train.

The undulated block system will allow you to implement the *Five Factors of Success*. However, to truly learn how to “fish,” there is one more idea that you must grasp before we dive into the actual programs that will help develop explosive, powerful athletes. It is the one, single variable of training that ties all sport together, an integral piece to the puzzle that if missed or neglected will sabotage the potential gains of even the most gifted athlete. That variable is the triphasic nature of all muscle action.