Periodization for Sport, Part I

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"Failing to plan is planning to fail."
-John Wooden

That quote alone should suffice as an introduction to what you are about to read. The article that follows explains periodization and how I use it when planning programs for my athletes.

What is Periodization?

Contrary to what seems to be popular belief, periodization is not a mythical or secretive method in the strength and conditioning realm. Periodization is, in simple terms, a plan. The process of planning is researched and quite scientific. The ultimate goal is to achieve higher levels of performance through a properly mapped-out progression. An organized training program eliminates the random approach some coaches may use; program design is much more than purely sets and reps, and a daily workout. There are a number of factors to consider when writing a program; one must understand how the effects of Monday's workout will impact Tuesday's workout and subsequently Wednesday's. This is where the science and understanding physiological responses come into play.

Understanding Frequency

Frequency refers to the number of training sessions in a given period of time and is a very variable factor. Traditionally, athletes will train three on three non-consecutive days per week. As the athlete becomes fit, the frequency can be increased to meet training goals. Recovery is an important component in determining frequency and periodization. Muscles must be given the time to recover in order to allow for a positive adaptation.

Hans Selye's *GAS (General Adaptation Syndrome)* theory holds that the human body possesses a "non-specific response to stress." This theory encompasses three stages: (1) alarm reaction, (2) the stage of resistance, (3) and the stage of exhaustion.

The *alarm reaction* is an acute stage that often elicits a "fight or flight" response from the central nervous system (CNS). In resistance training, this stage may be characterized by a decrease in performance. Common symptoms of this phase are muscle soreness and fatigue. This stage is necessary for improved performance and positive adaptations.

The *stage of resistance* is also commonly referred to as the "stage of adaptation." For the resistance trainer,

performance increases during this stage as the body adapts to the program. Most of the physical or mental exertions, infections, and other stresses that act upon us produce changes corresponding only to the alarm reaction and stage of resistance.

Finally, the *stage of exhaustion* is reached when the body's ability to resist or adapt to a stress fails. In the resistance trainer, the exhaustion stage is marked by one of two possible events. In one case, despite strict adherence to a tried and true program, the participant notices that performance neither decreases nor increases but plateaus. In the second case, performance decreases as the resistance trainer reaches a state of overtraining characterized by the over-stressed body's inability to adapt to the program. Both cases are excellent examples of the dangers of paying too much attention to the absolute amount of weight lifted. Whether or not the weight can be lifted becomes irrelevant because the body has already failed to adapt.

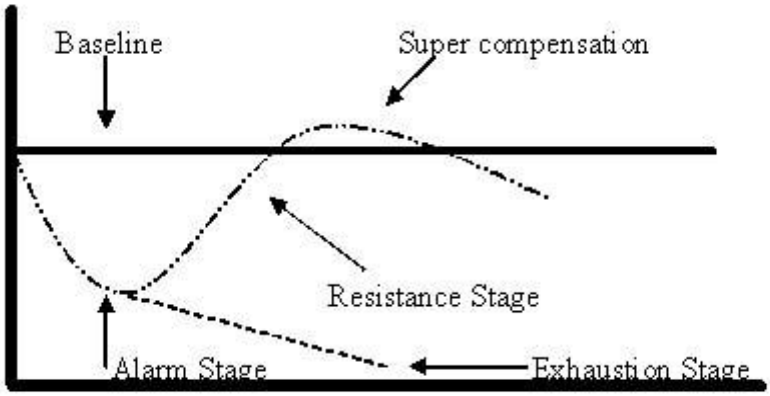

Figure 1. Supercompensation Curve

The goal of training is to successfully introduce the workout or stimulus when the athletes' fitness levels have improved over the baseline levels. This is very difficult procedure in a team setting, as athletes' will recover at different paces, and everything (recovery related) is not controlled.

Eastern Bloc

The periodization model was introduced to Americans via exposure to the Eastern Bloc countries. They initially used it to prepare their athletes for competition in world games and Olympic events. The difference between them and the Americans is that they controlled every single detail for the athlete. They controlled the athletes' training, rest, massage, nutrition, and other recovery modalities. Americans do not have the same luxuries and therefore cannot copy the exact classic model; very few strength coaches and trainers have complete control of their athletes at any point in time. They can tell them all the right things to do and eat after a training session, but it is completely up to the athlete to make the right decisions. College athletes who have tight budgets, eat cafeteria food, stay up late, and enjoy partying may find it difficult to do all the things necessary for improving performance and maximizing their supercompensation phase. Therefore, coaches cannot blindly copy different programs and must make them specific to their sport.

Periodization Models

A periodized training program can also be referred to as a Macrocycle. This term typically refers to a year's worth of training cycles. The macrocycle is made up of mesocycles, which are typically four-week training cycles with a specific training goal. The mesocyle is then comprised of microcycles, which are generally week-long training cycles. The broad overall goal of periodization is to scientifically plan a peak in performance. This is primarily accomplished through the systematic altering of intensity and volume. There are a number of periodization models that have been discussed in texts, but the primary ones that will be discussed are the linear model, non-linear model, and conjugate model.

\The linear model allows for a single peak in performance and begins with high volumes and lower loads/intensities. As time progresses, volume decreases and loads/intensities increase to ensure that athletes' are gaining strength and power for their sport. This model has many flaws in that hypertrophy is only focused on in the first mesocycle and the lean mass gains tend to diminish in the subsequent phases of strength and power due to the decrease in volume. Likewise, strength and power gains attained through neuromuscular adaptations during later phases are diminished during the return to the hypertrophy phase.

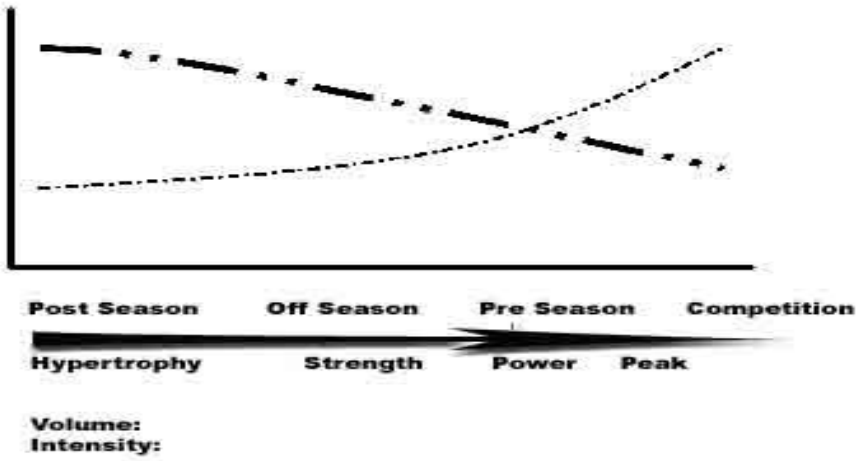

Figure 2. Linear Periodization

The non-linear model recognizes the problems of the linear model and attempts to alleviate the situation by alternating between high and low volume phases. There are a number of non-linear models. Charles Poliquin popularized the first model, and called his phases accumulation (high volume/low load), and intensification phases (low volume/high load); these phases are alternated throughout the year. This model is more effective for athletics because it recognized that many team sports rarely need to peak at the beginning of the season, and that they will need to have multiple peaks throughout their competition phase.

The next example of non-linear periodization is the undulating model. The undulating periodization model

actually adjusts the sets, reps, speed of movement (tempo), and rest period every single workout. So, in effect, your body would be receiving a different stimulus every workout and would make it more difficult for your body to adapt. The table below shows a three week program manipulating sets, reps, and load.

	Day 1	Load (% 1RM)	Day 2	Load (% 1RM)	Day 3	Load (% 1RM)
Week 1	10x3	85%	3x12	62.5%	4x8	72.5%
Week 2	3x12	65%	4x8	75%	10x3	87.5%
Week 3	4x8	77.5%	10x3	90%	3x12	67.5%

Another example of non-linear periodization is the conjugate method. Louie Simmons and the Westside Barbell Club popularized conjugate periodization, a style of periodization that focuses on improving all qualities of performance, concurrently. This means that speed, hypertrophy, strength, and power can be applied within the same microcycle. Initially put forth by Yuri Verkoshanksy, the conjugate model has evolved largely through the sport of powerlifting and can be applied to most team sports. Each day during the week will have a different emphasis, and the parts are combined to make the whole stronger. This method seems to be the most effective in that many performance attributes can be performed in the same week, but they must be organized correctly. You wouldn't want to do your speed work near the end of the week when your athletes' fatigue levels may be higher than at the beginning of the week. Likewise, you wouldn't want to do a high volume hypertrophy workout prior to performing your high quality strength and power work. All of these details must be taken into consideration when designing training programs.

In part II, I will present a new model for periodizing programs for sport and, in particular, progressing the different qualities of performance to prepare athletes' for their sport.