

THIS INFORMATION CAN BE FOUND IN YOUR TEXTBOOK HOWEVER, THIS SUPPLEMENT WILL HELP YOU TO FURTHER UNDERSTAND THIS ADVANCED CONCEPT. BE SURE TO BRING THIS WITH YOU TO THE COURSE AS IT WILL BE REVEIUED AT THAT TIME. PLEASE READ THIS HANDOUT BEFORE THE DAY OF THE COURSE.

PERIODIZATION

A) Introduction

Periodization is defined as the overall, long term cyclic structuring of training and practice to maximize performance. Or in simple terms, planned results. A periodized program systematically changes workouts at regular intervals so specific goals can be met. This type of training was originally developed for strength and power athletes preparing to peak for a competition. The idea behind the program came from Canadian endocrinologist Hans Selye who studied the adrenal gland and the effects of different types of stress on animals. His work created the "general adaptation syndrome," which inspired the former Soviet Union and East Germany scientists to develop a theory of training called "periodization" in the 1950s and 1960s. The traditional periodization models made changes in the workouts for weight lifters so that physical performance would be at a maximum for a competition. More modern models target goals in a health and fitness program in order to keep the exercise regimen interesting and challenging for many years.

Some benefits of periodization are:

- 1) Superior to non-periodized programs in the development of strength, power, muscle size, muscle endurance and power.
- 2) Decreased likelihood of overuse injuries through variation. Intensity of the exercise fluctuates throughout the program to avoid adverse effects of too much exercise.
- 3) Prevention of plateaus and boredom.
- 4) Optimizing your client's personal effort.
- 5) Enhance client compliance.

Begin planning by prioritizing your client's goals for the short term (first three months) and the long term (twelve months.) Your untrained clients will most likely see dramatic results of the program

early on, however, this 'general training effect' will diminish, requiring more effective programming to see continued results. Resetting goals and prioritizing needs on a regular basis will aid in continued success in the program.

The basic principle behind periodization consists of cycling volume (the quantity of work being performed) which is made up of reps, sets, minutes, distance and duration with intensity which is made up of load, force, weight lifted and speed over specific time periods. A well designed periodization program will provide adequate recovery while simultaneously prevent detraining or overtraining.

B) The first step in designing a periodization program is to break the training time into three different cycles. The first cycle is a short term cycle called a microcycle, which typically lasts seven days. It does not matter how many training sessions occur in one week, a microcycle is always seven days. It is a weekly training program that takes into account the daily and weekly variation involving intensity, loading and exercise selection. A microcycle also defines what is done for a particular training variable.

C) The midterm mesocycle begins with a high volume phase and ends with a high intensity peaking phase and is usually four to six weeks in duration.

Originally, the mesocycle was used to describe the major training phases of an entire year broken into 2-3 month spans. However, with research discovering optimal gains in physical conditioning are made with changes every four to six weeks, the mesocycle was altered.

D) The long term macrocycle is made up of several mesocycles and is usually one year in length. For athletes, a macrocycle commonly begins and ends after the last competition for a season. Macrocycles can also be longer than a year. If you have an Olympic athlete, the length between games is four years, creating a four year macrocycle.

The training year is broken up into training phases as well as cycles. Each training phase is made up of several mesocycles, which are made up of microcycles.

E) Sports and Conditioning Phases (European Terminology)

Preparation or early preseason phase works on general physical conditioning to prepare for the season. Workouts are normally high volume and low intensity.

First transition or late preseason phase bridges the preparation phase with the in-season or competition phase. The intensity of the workouts increases and the volume decreases.

Competition or in-season phase maintains physical condition and sport specific skills for the season while preparing the athlete for competitions. The end of this phase usually will involve a major

competition, possibly a state or national championship. Maximum intensity and minimum volume make up the workouts for this phase.

Second transition or off-season phase is made up of active rest. This phase allows for the individual to both mentally and physically recover from the competition phase. Some type of training is performed during this phase to keep the individual's physical condition from diminishing.

F) Power Sport Phases

After hearing about periodization from the Europeans, American coaches Stone, O'Bryant and Garhammer in 1981 decided to come up with their own terminology for a periodization training program. They developed the power sport phases for strength /power athletes such as Olympic weight lifters and the throwing events in track and field. They thought if the training phases were shorter, greater improvements could be made over the entire year. Instead of having 4 long training phases like the Europeans, the Americans shortened theirs to 4 weeks so that the periodization plan could just cycle throughout the year. This type of periodization program was originally designed for strength/power athletes only, but it can be adapted to almost anyone's training. Their model breaks a training program down into five mesocycles, beginning with high-volume / low-intensity phase.

Hypertrophy phase increases muscle mass and size and tolerance to resistance training, high-volume (8-20 reps per set) and low-intensity exercise.

Strength phase promotes body strength and prepares the body to develop power and maximal muscle force. A transition between the hypertrophy and power phase. Volume is decreased (2-6 reps per set) and intensity is increased.

Power phase develops maximal muscle power, the intensity is very high and the volume (1-3 reps per set) is very low. Allows one to recover physiologically from the previous high volume training.

Peaking phase increases peak strength and power for a particular competition, a decrease in volume helps to compensate for the increasingly heavier resistance used to promote maximal strength and power increases.

The athlete will prepare for maximal efforts needed for a competition (1-3 reps per set).

Active rest includes rest and recovery from the physical and emotional stress of the training cycles, low-volume or low-intensity, light weight training and exercises not performed during competition.

G) Training Categories

These are terms that can be combined with specific aspects of a cycle or phase. They are broad types of training.

General training: The training done prior to more intense workouts. Getting in shape to get in shape. This type of training will have at least one exercise for each major muscle group. Develops all-around

fitness. Makes up the majority of the activity done during the off season and early preseason or preparatory phase.

Sport-specific training encompasses drills and activities that directly relate to the athlete's sport. Develops muscular characteristics and strengthens the muscle groups to excel in a particular sport (sprinters will work on hips, thighs and lower legs). Can be done in all training phases.

Competition -specific training includes performing the sport in an environment or situation that is similar to the actual setting of a sport or competition. This type of training occurs in late preseason, in-season or competition training phases.

Examples are scrimmages, exhibition or preseason games.

A well planned program will consider the short term, mid term and long term needs of the client by planning daily workouts, workouts for the next three to four months and an annual plan.

MODELS OF PERIODIZATION

The most common models of periodization include increasing intensity and decreasing training volume as a competition approaches. Additionally, the volume of skill training and specific competition strategies will also increase at this time.

Just prior to competition, intensity will peak, thus allowing a recovery period right before the competition which will enhance maximal performance skills.

Yearly Models: This is the most widely used model varying training intensity, volume and skill training. As previously mentioned, increasing the intensity and decreasing the training volume prior to a major competition.

Weekly Models: Variations made to the workout with in one training week. Generally speaking, high intensity or high volume days should be followed by days of complete rest or low to moderate intensity. In order to recover from the harder training day, lighter days must be incorporated into the plan.

Variations of the exercise and exercise order are other changes that can be made during the week.

An example of weekly variation is as follows:

One day of high, moderate and low intensity all at a moderate volume

3 sets of each exercise: 100% 10RM, 10 reps (high intensity) Monday

80-85% 10 RM, 10 reps (low intensity) Tuesday

90% 10 RM, 10 reps (mod intensity) Wednesday

Note there is ample rest time between the two hardest training sessions for the body to fully recover.

NONLINEAR MODELS OF PERIODIZATION

What are they?

Also referred to as undulating models for resistance training, they are becoming increasingly popular as they prove to be just as effective as classic periodization methods. This type of periodization training is given its name because of the dramatic change in the resistance used by varying the workout within 1 or 2 week periods among light, moderate, heavy and very heavy resistance. An example of a nonlinear program is: an athlete trains with moderate 8-10 RM resistance on Monday, heavy 3-5 RM resistance on Wednesday and light 12-15 RM on Friday for 12 weeks. The 12-week period is followed by a short active-rest phase and the training cycle is then repeated.

What are they used for?

This form of periodization has shown to be most effective for team and individual sports in which peaking for one competition is not of prime importance because many competitions take place in a season

(basketball, baseball, wrestling, tennis.) A higher volume of training is performed when light and moderate resistance is used. Not only does the training intensity vary on a daily basis, but also the training volume.

Proper Progression

To ensure that your client is getting the maximum benefit from their periodization program, proper progression is essential. Keep in mind that training adaptations will be influenced by the individual's age, gender, health status, functional abilities and psychological as well as physical tolerance to exercise. Under or overestimating a client's physical ability is a common occurrence during the training cycles.

Preparatory Program

Beginning a training program with preparatory conditioning or a "base program" can eliminate many of these mistakes and gradually train the individual without under or overtraining.

Normally, the preparatory program will last anywhere from four to twelve weeks, depending on the client's age, health and fitness level. More de-conditioned client's will require a longer program than someone who has a higher fitness level. Gaining strength and endurance is not the goal with this program. The client should be made aware to 'feel' the changes in his/her body from the workouts. For example, does the individual have more energy from exercising? How does he/she feel afterwards? Are they sore? If so, for how long?

This program is also an ideal time for teaching proper lifting techniques (when the weight is at a minimum), educating the client about different types of exercise (cardiovascular, resistance), nutrition

and good pain vs. bad pain. It is important that the individual(s) have a solid understanding about these items prior to any intensive training to avoid any unnecessary injuries or unrealistic expectations. The clients that are just beginning a workout program who are in fairly bad shape will see some results rather quickly. The tough times come when change does not happen so quickly or dramatically and the client becomes depressed. This is a crucial time for both you and the client; it is when most dropouts occur. You as a trainer can combat that by keeping the program interesting, challenging and most importantly, individual to each client's needs.

PLANNING FOR ONE YEAR

Use the following steps to plan for the year:

- 1) Document the month(s) of major competition(s)-this will most likely occur at the end of the training year (weeks 49-52).
- 2) Work backwards from the major competition(s)-fill in dates and information of any minor competitions. If it is a season-mark the beginning and end of the season.
- 3) Fill in the months for the rest of the year starting with the month, which immediately follows the month of the last major competition.
- 4) Determine the length of the season (the time period between minor and major competitions. Estimate the total number of training phases in one year by placing lines where one phase will end and another one will begin.
- 5) Establish major goals of the program though various months and training phases.
- 6) Indicate low, medium or high intensity training and volume (they must be appropriate for the goals of each phase).
- 7) Make a sketch of the volume and intensity curves for the year to get a general training plan.

PLANNING A MESOCYCLE

Create a planning guide (on paper for your clients) with the following components and design the mesocycle from the guide.

- 1) Sport or activity: Identify the specific training to take place.
- 2) Training phase: State the name of the phase that is often named for the training goal (strength training phase, strengthening/power phase).

- 3) Length of the phase: The amount of time for the phase- usually expressed in weeks.
- 4) Dates of the training phase: The precise dates the phase will start and stop.
- 5) Training goals: Goals established for each phase.
- 6) Overall phase volume: Compared to other phases throughout the year (low/med/high).
- 7) Overall phase intensity: Compares to other intensities throughout the year (low/med/high).
- 8) Weekly variation of volume and intensity: How the V and I will increase or decrease on a weekly basis within a phase. (The overall phase can be low volume but there will be a week of higher volume)
- 9) The number of training sessions per week.
- 10) The types of exercises to be performed: Concentric, eccentric, plyometrics, power exercises, etc.
- 11) The number of exercises: Average 8-12 a session. Look at the total number for the entire workout not a particular body part.
- 12) The set-rep scheme: This is normally a range. Depending on the result you are trying to achieve, sets and reps will vary. Plan accordingly.
- 13) Rest between sets: Again, depending on the result-short, medium or long rest periods will be appropriate.

PLANNING A WEEK

By this time, the number and type of exercises should have already been decided upon. Now it is time to decide how many multi-joint, single-joint, single limb, arm, leg, abdominal, back or power type exercises will be done on a weekly basis.

In addition, a general range of reps, sets, and rest time should have been established for the mesocycle. During this planning session, the number of reps and sets for individual exercises and exact rest times will be determined.

To plan on a weekly basis, simply expand upon the decisions made in the macro and mesocycles.

DESIGNING A SINGLE TRAINING SESSION

Now that the goals have been set, the exercises chosen, sets, reps and rest times determined, it is now time to decide the order of the exercises, the resistance to be used for each exercise and what type of equipment (machines, dumbbells, barbells or a combo).

To choose the proper resistance, use 95-100% of the RM on heavy training days, 85-95% of the RM on moderate days and 75-85% of the RM on light days. Percentages of the RM will vary from exercise to exercise.

Do not be too particular if an individual has performed 9 reps instead of 10. You want them to work in the training zone, which is the desired number of reps plus or minus two reps. If an individual is constantly out of the training zone, the resistance needs to be adjusted.

Keep a weekly record of the activities, training phase, week, date, exercise, reps, sets, weight (planned and actual), rest time and comments regarding how the session went, pointers to keep in mind for future planning.

After the goals of the individual have been set and prioritized, designing the microcycle is the next step. There are virtually countless options available for program development, be creative and different. Two variables that are the most important with program design are: including the specific goals of the client (at that specific period in time) and where the client is in a specific cycle and phase of training. Make sure you keep accurate and up to date records, find out what works for the client and perform periodic assessments to ensure the program is doing what it is supposed to do.

IN REVIEW

To ensure that you are designing an effective periodization program for your clients, the following steps must be completed:

Document the client's current level of fitness, with any injuries, illnesses, etc. that may play a part in their exercise routine.

Write out the long and short-term goals, set by both you and the client.

Break the goals into phases, what will be immediate goals and goals that will be long term (six months out to twelve months.)

Develop the macro, meso and microcycle. Begin general planning for a year out and then specific planning for the next month.

Keep accurate records of what has and has not worked in previous training

sessions, seeing progress from session to session, comments on how the individual felt during the workout, etc. It also helps the client see progress and is a good indicator of when it is an appropriate time to change the intensity of the program.

Re-evaluate the effectiveness of the program every four to six weeks. Programs may need to be altered or completely changed at any time during the training process. Remember to be flexible and work with your client.

When used properly, periodization is a powerful training technique that brings together individualization, training goals, physical assessments and re-assessments, planned progression and prioritization of training.