Overview of Periodization Methods for Resistance Training

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Belgrade, 26. April 2006.
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1. Introduction

The reason for writing this article is to put my current knowledge regarding periodization in some systematisized form, thus allowing more deeper discussion and as a result more knowldege in mine, and yours, coaching toolbox. The purpose of this article is not to attach „good" or „bad" atributes to some forms of periodization, but rather to critically analyse them, their pros and cons, thus allowing an easyer choice/decisions for S&C coach implementing and combining them in some specific situations for specific athletes.

This article is not going in discussion „what is periodization or strength" and simmilar stuff, but it is going to be more general in its nature. Also, it is written for coaches with advanced knowledge regarding resistance training and periodization, altought I will try to make it readable and fun.

2. Before we start

For the sole purpose of this article I will define four goals resistance training should cover:
1. Structural and strength endurance (15-20 RM)
2. Hypertrophy goals (5-15 RM)
3. Max strength (1-5 RM)
4. Power/Explosivness or Dynamic Effort (50-70% 1RM & Olys)

Let me remind you that this classification is higly debatable and it is used only for easier explanation of different periodization methods, so please do not bother me or yourself with it, just accept it how it is and direct your attention to the periodization methods described. Thanks.

3. Many coaches, many methods

Basically, what you are going to read here are „pure" forms of periodizaion methods, a situation which is not happening so often in „real life". Real life periodization is more a combination of more periodization methods, especially if you training your athletes for skill,

endurance, strength, flexibility, (you name it)... You can combine different periodization methods for different components of your system, thus using one periodization method for strength work and another for speed work. Looked at the whole, it is hard to distinguish what method of periodization is used. Also, do not forget that the system as a whole is always bigger than the sum of its components, and one component will affect other and *vice versa*, so everything is interconnected so you should plan your training accordingly!

4. Three groups of periodization methods

There are three main groups of periodization methods for resistance training:
1. Sequential method
2. Concurent method
3. Conjugate Sequence System (or Emphasis Method)

You can combine the mentioned methods so you can easily create millions of combinations. You should not forget that the purpose of periodization is to achieve planned goals more easily and not to be „too" creative... Remember the KISS principle (Keep It Simple Simon) everytime you feel the need to create some way too complex variations of presented methods.

5. Sequential Method of Periodization

Sequential method uses specific time intervals to develop only one training goal at a time. There are numerous variations of sequential method, mostly classified according the following variables:
1. The duration of specific time intervals
2. The sequencing of training goals (methods, means, loads)

What I am going to do here is to describe common variations of sequential method. Note that I didn't said *all variation*, but only some mostly used. This should give you the undestanding of sequential method.

5.1 Long Linear Method

Maybe the most popular method in resistance training is Long Linear Method. Note that most popular is NOT the sinonim with the best! There is no best method, only optimal for reaching predefined goals for particular athlete at particular stage of his career.

Long Linear Method uses longer time intervals (3-4 weeks or microcycles) to develop only one training goal. It proceeds from high volume-low intensity to low volume-high intensity training and this is because it is termed *linear* (picture 2).

Basically, Long Linear Method uses one block (3-4 weeks) to develop strength endurance, one block for hypertrophy, one block for max strength and one block for power (picture 1).

Picture 1. Sequencing of Long Linear Method

If we depict average intensity (weight used) and volume (tonnage lifted) we will get the following picture:
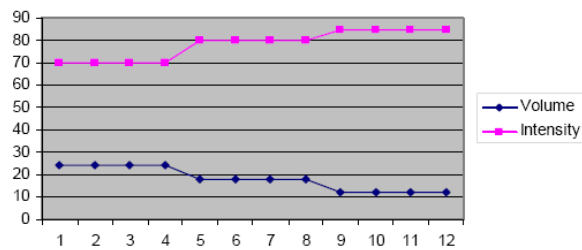
Picture 2. Intensity & volume during Long Linear Method

Note that we can develop „smooth" or „sharp-step like" switching between blocks, mainly using greater or smaller increase in weight.

But, what happens when the athlete finish proposed plan for four months? Does he go from the start again? To default: YES!

Advantages: The Long Linear Method is great for begginers, for those who lifts for the first time. It allows time and easy load for technique learning, and also develops ligaments, joints etc using lower intensity and greater volume. Its progression allows for slow and stable adaptation and result progression.

Shortcomings: The main shortcoming of Long Linear Method is that when developing one block, the others will decrease. For example, when developing structure or hypertrophy, max strength and power will decrease and *vice versa*. This is not so important for begginers, but as soon they develop minimal GPP and SPP levels, its „round and round" sequencing will lead only to stagnation. I know this from my own experience. Also, if there is no variety & progressions used, the athlete is soon going to be bored by using same methods, loads & exercises. Note that there are some powerlifters that developed great strength using this method, so don't say NO at the instant.

Variety & progression: As stated by Poliquin, the athlete's adapt to particular exercise in as long as 6 workouts. Cosgrove stated that athletes adapt faster to rep brackes than to exercises. So, when using this method, exercises should be changed once in a while (the exception is when the athlete is in in-season and maintaining current level of strength; in this situation it is better not to experiment because this may cause DOMS and affect main performance on the field, so it is better to keep it how it is, but you can refresh your athletes after 2month to extend sport form state if needed). Exercises can be changed every month (when switching to another goals-blocks). Athlete can progress from week to week, by trying to lift more for defined rep bracked, by increasing number of sets, decreasing the rest between sets, playing with tempo, buffer etc. Last week in each block can be unloading week. Unload can be done by reducing number or sets, reducing the weight lifted or both. This should prevent boredom and overtraining.

Variations to presented method: Use your imagination. From Power Block you can go backward instead of jumping to Structural Block. Just remember that block should follow „linear approach" ascending or descending. If you screw this up, then you don't have Long Linear Method, but rather Long Undulating Method.
Another variation is Reversed Long Linear Method, meaning that you start with low-volume high-intensity training and progress to high-volume low-intensity training.

5.2 Short Linear Method

The only difference between Short and Long Linear Method is in the duration of specific time intervals. While Long Linear Method uses longer time intervals (3-4 weeks or even more), Short Linear Method uses shorter time intevals (1-2weeks) to develop particular ability (picture 3).

Picture 3. Sequencing of Short Linear Method. Note that there is a same sequence as in Long Linear Method but only done in less time.

Simmilar to Long Linear Method, the Short Linear Method progress from high-volume low-intensity to low-volume high-intensity training (in linear fascion) but in shorter time. Again, there can be „smoothed" and „step like" variations of Short Linear Method.

Advantages: Short Linear Method have more advantages than his „bigger brother" Long Linear Method, and it is more appropriate for mediocre (non-begginers) lifters. Shorter cycles should prevent from de-training of abilities that are not currently developed and it should prevent from boredom and over-training (because stimulus is short – 1 week). Also, „waves" of loading are natural progression of this method, so you dont need to bother „planning" them.

Shortcomings: It is not appropriate for begginers, because of its too fast building of the intensity. On the other hand, one week of concetrated development of particular ability may not be optimal-enough for progress in advanced lifters (stimuli is too short in duration). Advanced lifter may be needing for more prolonged concentrated development of one particular ability. As also true for Longer version, Short Linear Method may fatigue athlete with its linear progression to high-intensity training, so does athlete, when he reaches the final block (Max strength or Power) is too tired from previous blocks so he cannot give his bests. This is highly dependent on the „build up" time (how much blocks preceeds high intensity ones). This can be solved by using undulating periodization (which is described later in the text).

Variety & progression: The simpliest variety method (which also prevents staleness) is to change exercises every cycle. There is no need for planning of „waves" and unloading in this method, because its short cycles will do it by themself. Just change exercises (or use some variations in them: new positions, grip, etc) to „refresh" your CNS and to stimulate your muscles from various positions. This should prevent form boredom and stimulate your progression. You can play with number of sets, tempo, rest etc. in every following cycle.

Variations to presented method: Again, use your imagination. You can try the revese method, and you can try to go „upward" during a mont and then „backward" (reversed) during another. Simmilar method is presented by Chris Thibaudeau in his Pendulum Method. Just dont forget that the progression should be in linear fascion, or you are implementind undulating method.

5.3 Long Undulating Method

Undulating, as contrary to linear methods, uses more „waving" approach in progression. In undulating periodizations there is no linear increse (or decrease) from high-volume low-intensity to low-volume high intensity training but rather „waves" (picture 4). Long Undulating Method uses longer specific time intervals (3-4 microcylces/weeks) to develop one particular ability.

Picture 4. Sequencing of Long Undulating Method. The only difference between this method and linear is in its „breaking" of linear approach, but rather using „waveing" approach.

Advantages: I dont see any advantages in Long Undulating Method comparing to Long Linear Method, and it is actually worse. On the first sight, the advantage can be the „non-linear" fascion of progression, thus allowing greater rest when it comes to max strength and power development, but this is not the case becasue specific time intervals are too long and there is unloading at the end of each cycle.

Shortcomings: This is the WORST method of all described! Why? Because it has all the shortcomings as Long Linear Method plus some new ones. Basically, when you develop one particular ability the others will fall. As a bonus, a begginer lifter will jump to fast to more intense training unprepared, so this may cause injuries. I dont see any particular situation where this method can be used unless if you want to put some begginer into problems, or to spin some mediocre level lifter „round and round" without progression.

Variety & progression: I dont want to spend my time and energy writing posible solutions for this „crappy" method. If you are interested, then use same methods outlined in Long Linear Method

Variations to presented method: All posible sequencing that you can figure out! But keep in mind that they should not be in „linear" fascion, because it is going to become Long Linear Method.

5.4 Short Undulating Method.

Same sequencing as in Long Undulating Method but in shorter time (picture 5). Short Undulating Method is simmilar to Short Linear Method, but insted of linear progression, undulating uses „non-linear" or waving progression.

Picture 5. Sequencing of Short Undulating Method.

Advantages: Short Undulating Method have the all advantages of Short Linear Method. Its shorter specific time intervals prevent from detraining and boredom and also from overtraining. Plus, Short Undulating Method may be better than Short Linear Method because of its „non-linear" progression, thus allows greater refreshment of an athlete when he reaches max strength and power week. Non-linear progression may be also more enjoyable to some athletes. Short Linear Method linearly increases intensity which can fatigue athletes, but Short Unudlating Method uses weeks of „accumulation" followed by weeks of „intensification" and thus provides greater frequency of

unloading which is great. It is also great for mediocre lifters (non-begginers). This is my favourite sequence method.

Shortcomings: Same as Short Linear Method. It is not for begginers and it is not for elite lifters. Its periods of concentrated development may be too short to induce progression in high level lifters. This also depends on number of different weeks in one cycle.

Variety & progression: Same as in Short Linear Method. Use new exercises every cycle, or play with number of sets, tempo, rest intervals etc.

Variations to presented method: All posible sequencing that you can figure out! But keep in mind that they should not be in „linear" fascion, because it is going to become Short Linear Method. Also, if you shorten specific time intervals too much, so that all the components are done in one microcycle (Daily Undulating Periodization), we are not more talking about sequence method but rather about concurent method.

5.5 Hybrids between Long and Short variations

As I stated at the beggining of this article, in real life there are offten no „pure" methods of periodization presented here. So, you can combine with Long and Short variations. For example use one month to develop develop structure, and then switch to Short Linear Method (or undulating) to develop hypertrophy, max strength and power, and then repeat (picture 6).
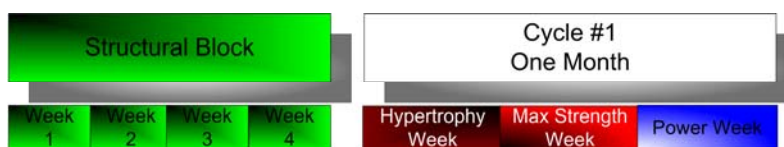

Picture 6. Hybrid between Long and Short Linear Method.

Note that with this approach you can reach some setted goals for particular athletes, but dont forget that, altought you can use all the advantages from combined methods, you can also use their shortcommings. Combine all the methods to reach setted goals, but dont forget that the whole is allways biger then the sum of its components. This is true for advantages, but also for shorcomings.

5.6. Hybrids between Linear and Undulating variations

Simmilar to above example, you can combine linear and undulating approach (picture 7).
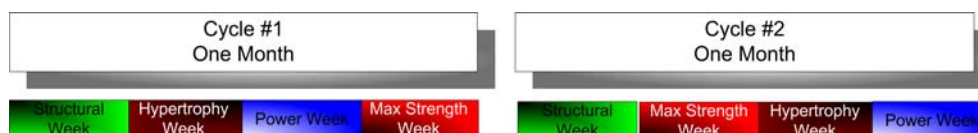
Picture 7. Hybrid between Short Linear and Undulating Method.

What is said for above hybrids is also true for this ones. Possibilities are unlimited if you are creative. But dont be creative for creativity-sake, but only for reaching predefined goals in particular situation with particular criteria. You can play with durations of periods for particular ability, sequencing and combinations of both.

The important thing that should be remembered is that the stagnation or improvement in Sequence Methods is determined by

1. Duration of particular block
2. Duration of its cycle (mainly determined by number of other cycles and their durations)
3. The inter-dependance between abilities

If the number of abilities that should be developed is way too large, then even the shorter variant will not be enough to allow progression. If the numeber of abilities is 2-3, then Longer variants may also be good, because time between development of particular ability is too small to induce stagnation or de-adaptation.


6. Concurent Method of Periodization

Concurent Method develops all abilities in a given time period, mostly one microcycle (week). This doesn't necessairly means that all the abilities are developed in one training session. Other sinonims of Cocnurent are Conjugated and Complex.

Concurent Methods of periodization can be futher classified according the emphasis on particular ability:
1. All abilities have same emphasis (volume, training time)
2. One or more abilities are more emphasised than others

6.1 Ordinary Concurent Method

Ordinary Concurent Method of periodization uses the same emphasis to develop all targeted motor abilities in a given time period (one microcycle – week). The problem is that some abilities need more volume to be developed than others (for example Structural and Hypertrophy work), so the problem is how to define „emphasis"? It could be defined as the time spent on development of particular ability in one microcycle rather than volume (because volume of Hypertrophy and Structural work will be allways bigger than Power and Max strength work, but when expressed as time, they will be simmilar). The example of Ordinary Concurent Method is depicted in picture 8.
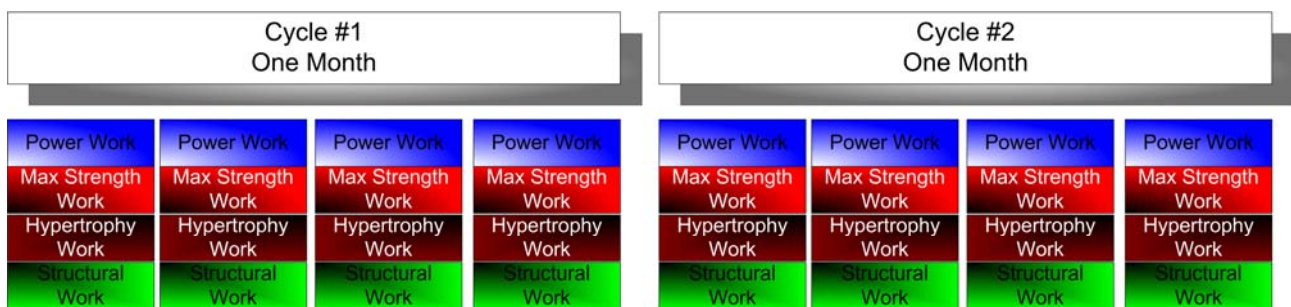
Picture 8. Sequencing of Ordinary Concurent Method

Advantages: The main advantage of Ordinary Concurent Method is that all abilities are developed at the same time, without any drop in any one of them. This is great method for mediocre and advanced lifters. Also, it is interesting because it provides variety in used methods, loads, exercises etc. Prevents boredom.

Shortcomings: It is harder to plan workouts. Advanced lifter are unable to adapt to larger number of stimuli and they need some concentrated block of particular ability to progress (while maintaining others). This highly depends on number of developed abilities and their inter-relations. Sometimes may be confused with „shotgun principle" or, using everything in a hope of achieving

everything. But, don't be fooled, because Ordinary Conjugated Method needs for advanced planning to avoid this situation. It can be also time and energy consuming, thus there is a need for really good planning of workouts and recovery procedures and this can be only done by advanced lifter or coach.

Variety & progression: There are enourmous number of methods for providing variety and progression in Ordinary Concurent Method. One of them is to pick different exercises every 1-3 weeks (depends on the level of a lifter). Unloading should be also provided by reducing volume, intensity or both every couple of weeks. You can play with reps (withing boundaries of rep bracket for particular ability) or with load (implementing buffer and waving of intensity), tempo, rest between set and number of sets etc. Another posibility is to change the order of exercises (or abilities) in a week or in one training session (but this is also form of emphasis).

Variations to presented method: You can change the order of performing particular exercises (and abilities) in particular session or in one microcycle. But, note that the emphasis should be the same for all developed abilities. You can choose not to develop all abilies in one week, and this option is explained in more detail later in text (in Hybrid and Combination section). One thing that bothers me the most is: are the all rep brackets being done within particular exercises (simmilar to pyramid method) or just only one per one exercise? I believe in that using more than one rep-bracket for one particular exercise can be detrimental (the body cannot adapt to different stimuly in one exercises, it is better to spread stimuly to greater number of exercises), so it is better to use only one rep bracket for one exercise (or even better: one movement pattern). I believe that you can finally see how it is bloody hard to define and distinguish different periodization method in real life!!! Should all the work presented (Stucture, Hypertrophy, Max Strength, Power) here be done on all movement patterns (or muscles if you use this BS classification) in one microcylce to be considered as Concurent?

6.2 Emphasised Concurent Method

The only difference between Emphasised Concurent Method and Ordinary Concurent Method is that Emphaised variation emphasise one (or more) particular ability within others that are developed concurently (picture 9).
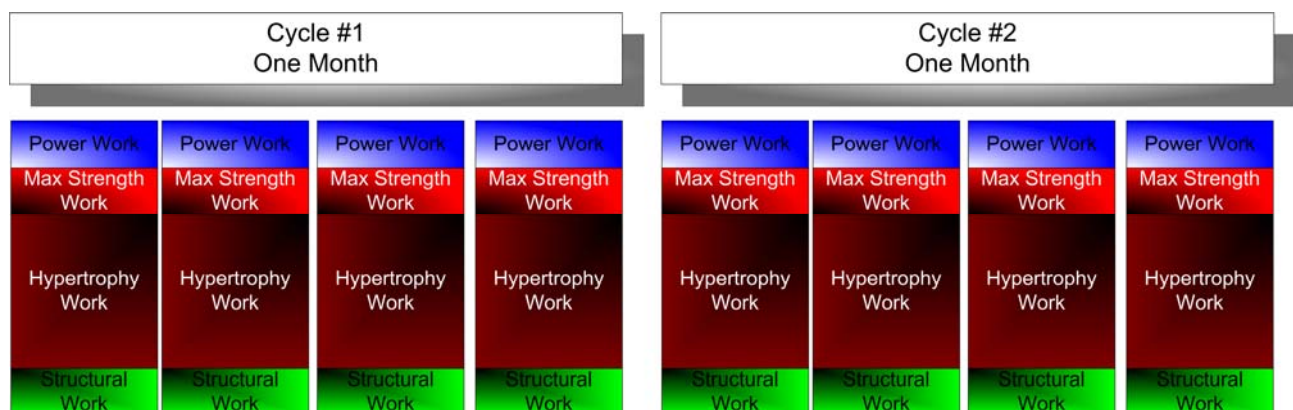
Picture 9. Sequencing of Emphasised Concurent Method

Advantages: Same as with Ordinary Concurent method, altought Emphasised Concurent Method also concentrate on particular ability while developing (or maintaining) others. Great method for advanced lifters who know their weakness and would love to improve it.

Shortcomings: Same as in Ordinary variation. Sometimes, advanced athletes are unable to adapt to larger number of stimuli so, emphasised ability should be developed and other should be put on maintenance rather than tried to develop (which may cause overtraining and de-adaptation). The problem with this approach is that the athlete should switch the emphaisis on other qualities to develop them, and this is called Conjugate Sequence System and it represents another periodization method (most advanced).

Variety & progression: Pretty much the same as in Ordinary variation. For emphasised work you may choose new exercises every 1-3 weeks, and for others you can keep same exercises for longer time.

Variations to presented method: Changing the order of exercises or training sessions in a week.

6.3 Hybrids of Concurent Method

Variations and hybrids are unlimited. You can actually use Daily Undulating Periodization, or switching of work on every training sessions in non-linear manner. You can concurrently develop couple of abilities (not all of them) and switch them in a circuit fascion (picture 10). Choice is yours, I am just throwing basic ideas and principles here.
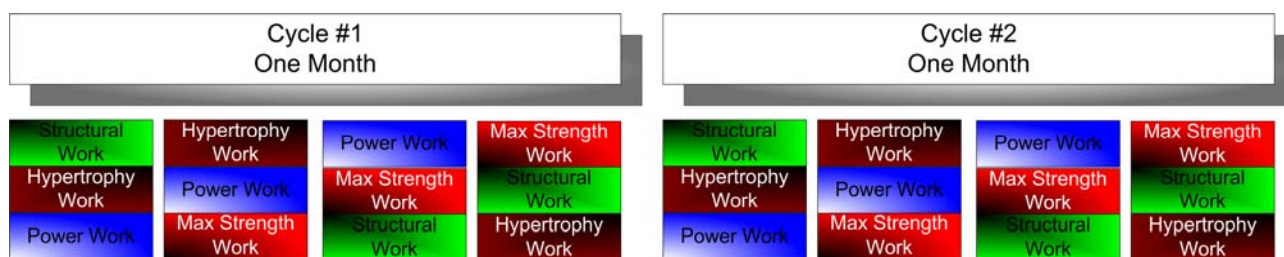
Picture 10. Rotational sequencing implementing both Sequential and Concurrent Method of periodization.

I hope that you have realised till now that there is no „pure" form of periodization in real life (read: training). There are too much of a factors, criteria, situations, exercises, movement patterns, loads, abilities and their sub-groups, to just classify things in one of the presented models here. Remember that those are only tools in your toolbox, to be used in particular instances to reach setted goals. Nothing else! So, please read this article only as a rough guide and not as a „written in stone" info.

7. Conjugate Sequnce System (CSS)

Conjugate Sequence System (CSS) is the most advanced method of periodization. It is based on the pros and cons of sequential and concurrent methods, trying to apply all the advantages and avoid all the shortcomings. It is based on the premise that the elite lifter is unable to optimally adapt (and recover) to larger number of stimuli (abilities) in the same time. Elite athlete needs concentrated loading of one particular ability, but this method will lead to decrease in another non-developed needfull abilities.

The solution is to develop (emphasise) one ability while maintaining all others with minimal volume. With this approach, athlete is optimally adapting to one stimuli while maintaining others and avoids stagnation, overtraining and fatigue. After some time, emphasis is switched to another ability. The „switch" can be more „sharp" or „smooth", thus we can differentiate between Sharp or Block and Smoothed version of Conjugate Sequnce System.

There are numerous variations of CSS , mostly classified according the following variables:

1. The duration of emphasis block
2. The sequencing of emphasis

Simmilar to Sequential Method, we can differentiate between Long and Short Emphasis period, and Linear or Undulating Switching of emphasis. The Long and Short versions will be described here, and you are going to use you critical thinking for Linear and Undulation variations.

7.1 Short Conjugate Sequence System

Short CSS is depicted in picture 11. Everything is done while the emphasis/volume varies during one microcycle. This basically means that only one ability is developed while the others are maintened (or slighty improved). The sequencing is done on micro level, thus every microcycle (week) there is a switch of emphasis on particular ability.
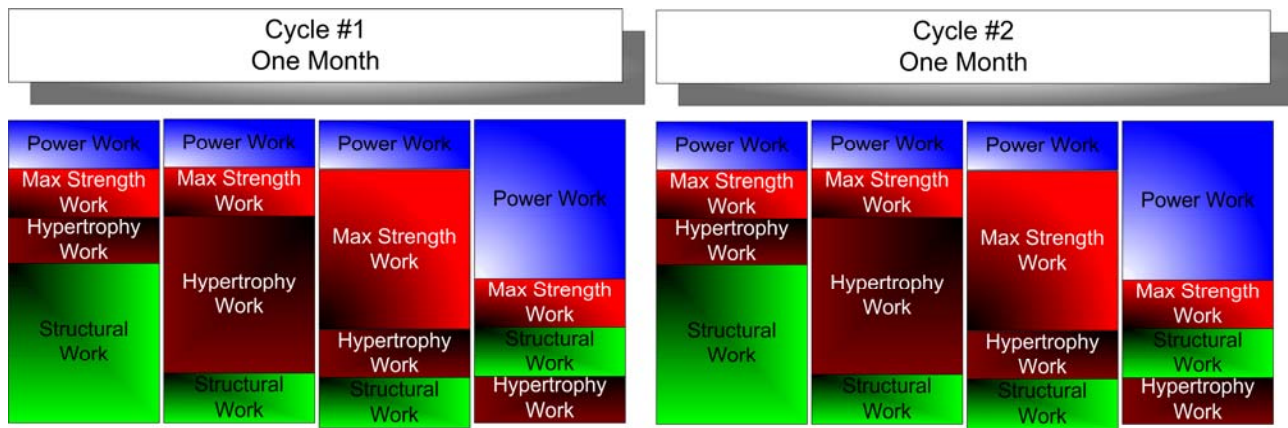
Picture 11. Short Conjugate Sequence System

Advantages: It develops one ability while maintaining others. Lower level of fatigue than in Concurent Methods. Appropriate for higher level lifters. Avoids stagnation, overtraining, boredeom.

Shortcomings: One week of emphasis may be too short to develop particular ability in most advanced lifters. There is a need for advanced planning, thus the athlete and a coach must be experienced with planning and programming of training. There is also a need for recovery procedures.

Variety & progression: Basically, the sequencing of emphasis provides enough variety and waving. New exercises can be choosed following every cycle. You can choose some varieties presented in Concurent Methods.

Variations to presented method: You can choose another sequence of emphasised blocks (unudulating for example) and their durations. You can use „smooth" or „sharp" change between the sequences.

7.2 Long Conjugate Sequence System

The only difference between Short CSS and Long CSS is in the duration of particular emphasised blocks. Long CSS uses longer time periods to develop particular ability (picture 12).
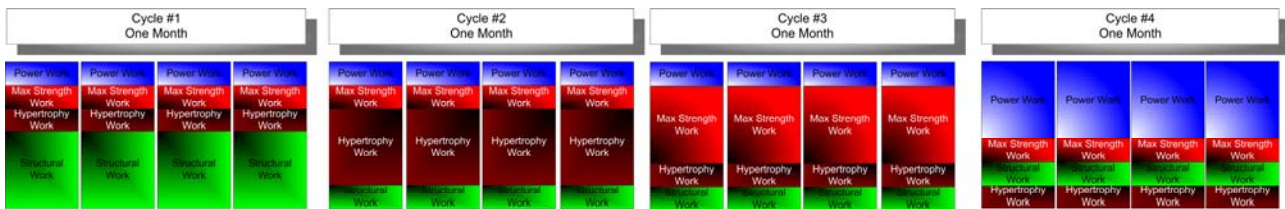
Picture 12. Long Conjugate Sequence System

<u>Advantages:</u> Same as Short CSS but it also allows better development of particular ability in advanced lifters, because they may need a longer duration of emphasised block.

<u>Shortcomings:</u> Longer durations of emphasis may need better planning and recovery procedures to avoid development of overtraining. There is a need for variety to avoid stagnation and boredom.

<u>Variety & progression:</u> Pick another exercise every block or even every microcycle (most advanced lifters) for emphasised ability, while for maintaining ones you dont need to pick new exercises to often. There is a need for unloading periods following couple of weeks of emphasised work. You can choose to progress with load (using buffer, or lifting same weight for greater number of times), sets, tempo, rest periods etc. I am just throwing some ideas here...

<u>Variations to presented method:</u> You can choose another sequence of emphasised blocks (unundulating for example) and their durations. You can use „smooth" or „sharp" change between the sequences.

7.3 Hybrids of Conjugate Sequence System

There are unlimited posibilities... For example you can emphasise 1-2 abilities while rotating couple of them for maintenance (picture 13). Try to combine Sequential and Conjugated method with CSS.

Picture 13. Variation of Short CSS

8. Conclusion

The presented three groups of periodization are just that: GROUPS. In real life everything is possible! You can combine them to achive selected goals for particular situation, for particular athlete and criteria. Note that in real life training systems it is very hard to differentiate which method is used (mostly more of them).

This article didn't provided more info on exercises selection and classification, progression, week and training structure. As stated before, the goal of this article is just in providing basic info

on periodization methods. How are you going to distribute various works (structural, hypertrophy, max strength, power) over various exercises and movement patterns (or muscles is you preffer this BS classification) in particular time frame it is your PROBLEM. Note, that thing are not so clear in real life as in paper...

I hope this article provided some elementary knowledge of peridioziation methods in resistance training and a starting point for futher discussion and implementation in real life training situations.