Concurrent strategies in strength training

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Concurrent training by definition means training for achieving multiple training goals at the same time. Concurrent training in iron game was made popular by Westside Barbell Club and Louie Simmons, who erroneously called it 'conjugate' (which is a term coined by Yuri Verkhoshanski, a method utilizing *delayed training effect* and *training residuals* and other fancy adaptation terms) instead of concurrent. Synonyms with concurrent are parallel and mixed training.

Why is concurrent training so hot topic lately? Because, in theory, when you utilize *sequential training* (or traditional, or linear training) you constantly move away from qualities you have just developed, and by the rule 'use it or lose it' you start de-training in those qualities (if there is no maintenance work aimed at maintaining those qualities).

Please note that *Block training* (or conjugate training, or *conjugate sequence system*) developed by Yuri Verkhoshanski is a special form of sequential training organized into blocks, where each block is aimed at provoking strong delayed training effect by utilizing concentrated loading (which induces overreaching). The blocks are 'conjugated' into specific sequence, so does training residuals and delayed training effects are maximally used at the most important time of the year (read: competition period, meets, matches, etc, etc).

Concurrent training, contrary, try to develop all important qualities at the same time. This approach, as any other, have its own pros and cons. The most major advantage of the concurrent approach is the parallel (hence the synonym with concurrent) development of all qualities. But the most major disadvantage is the fact that after some time (or with the most advanced athletes) you simply cannot develop all the important qualities at the same time, without risking over-training and limiting potential training effects.

This is where a modification of concurrent training comes into play. The modification is simple and it is based on training emphasis. You still train all the qualities, but you emphasize only few of them while maintaining others, then you switch. In my old articles I confused this modification of concurrent training (emphasis methods) with conjugate sequence system and Block training. My bad! Although it is very similar to Block training it is NOT Block training, nor it is conjugate nor conjugate sequence system. It is modified concurrent training.

This little rant of mine was aimed at 'solving' (or confusing you even more) this concurrent vs. conjugate problem. The topic of this article is concurrent strategies in strength training and this is the topic I will hold on for now on, with a little talk about possible use of emphasis method at the end of this article. Stay with me, because fun is just about to start.

Basically, there are numerous goals that can be achieved with strength training. Depending on the author, there may be different number and names of them. For the sole purpose of this article, I will define those goals, mostly relying on Westside terminology

1. **Maximal and Relative Strength**
   - The goal is the development of maximal strength
   - The method used for developing this motor quality is **Maximal Effort**, or **ME**
2. **Explosive Strength**
   - The goal is the development of explosive strength, or the ability to produce great force in least amount of time
   - The method used for developing this motor quality is **Dynamic Effort**, or **DE**

3. Muscular Hypertrophy

- The goal is the development of muscular hypertrophy, without going into the debate of *sarcoplasmatic* vs. *myofibrilar hypertrophy*
- The method used for developing this motor quality is **Submaximal Effort**, or **SE** (mostly for *functional* or *myofibrilar hypertrophy*) and **Repetition Effort**, or **RE** (mostly for *total* or *sarcoplasmatic hypertrophy*).

4. Muscular Endurance

- The goal is the development of muscular endurance, fat loss, *anatomic adaptation* and sarcoplasmatic hypertrophy (depending on the context). Some also put 'vascularization', 'glycogen depletion', 'mitochondria development' as the goal of this method
- The method used for developing this motor quality is **Repetition Effort**, or **RE**

As you may see, even in this classification there are 'conflicting areas' regarding the goals and methods used. I am very familiar with the fact that this classification can be criticized, broaden, reduced etc., but anyway, it is useful for the purpose of this article, which is description of *how to* use different *concurrent schemes* to develop all those goals at the same time (and time is very relative term, just ask Einstein).

It can be said that reaching of the mentioned four goals (and thus motor qualities) is based on utilizing different loading protocols (weight, reps, sets, tempo, rest, etc.) or *methods*. So, each of the mentioned four methods (ME, SE, DE, RE) utilize different loading protocols. This is based on the *repetition continuum*, or the 'idea' that different goals can be achieved utilizing different reps per set. There is a dynamic interaction between the variables of reps, sets and loads. The load used (% of 1RM) ultimately determines how many reps per set are done. Reps per set (or set time) ultimately determines how many total sets must be done. The interaction between the three will affect what adaptation is seen. Although not all authorities agree, there is thought to be a continuum of adaptations which may occur with different repetition sets. This continuum is called *repetition continuum*.

According to Christian Thibaudeau (one of the coaches that have great influence on my philosophy), this repetition continuum changes as the athlete advances. Here is the modified table from 'The Black Book of Training Secrets – Enhanced Edition'.

	Beginner	Intermediate	Advanced
Strength [ME]	5-9 reps/set	3-7 reps/set	1-5 reps/set
Functional Hypertrophy [SE]	10-12 reps/set	8-10 reps/set	6-8 reps/set
Total Hypertrophy [RE]	13-16 reps/set	11-14 reps/set	9-12 reps/set
Strength Endurance [RE]	17-24+ reps/set	15-22+ reps/set	13-20+ reps/set

Another repetition continuum is presented by another bright guy, Lyle McDonald. Here is modified classification of loading protocols (motor qualities) from 'Periodization for bodybuilders' article (which can be downloaded from Lyle's website).

Type of training	Reps (%1RM)	Rest	Tempo	TUT (time under tension)
Strength training [ME]	1-5 (85%+)	3-5 min	3/0/X	20 sec or less
Intensive bodybuilding [SE]	4-6 (80-85%)	2-3 min	3-4/0/1	20-30 sec
Extensive bodybuilding [RE]	6-8 (75-80%) 10-15 (70-75%)	1-2 min 1-2 min	3/0/2 3/0/2	30-40 sec 40-60 sec
Really Extensive bodybuilding [RE]	N/A (60-65%)	1 min	2/0/2	60-120 sec

And to finish this copy-paste part of this article, here is the 'repetition continuum' from James Smith, author of 'High/Low Sequences of Programming and Organizing Training'.

- **ME** → (+90%) 1-3RM depending on strength preparedness
- **SE** → (80-90%) 4-7RM depending on strength preparedness, 4-10 repetition range
- **RE** → (<80%) +8RM, >8 repetitions
- **DE** → (up to 80% for Olympic lifts/derivatives) (up to 70% for classic Powerlifts/derivatives)

As I pointed earlier, each author utilize slightly different classification, but look for the 'common denominator' --- every one of them classified the goal they want to reach (motor quality), method they used to reach it and loading protocol that determines that method (based on repetition continuum).

But guess what? Different people respond differently to rep ranges. Some may 'grow' by doing triples and doubles (3 and 2 reps per set with 2 and 3RM load), and some may grow doing 15s. Anyway, you won't grow if you don't eat. Same stuff for strength – some may increase their strength by doing maxes and some may increase it pretty good by doing 6s. As coach Thibaudeau pointed, those responses depend on athletes level, but I would love to add: it depends on athletes characteristics (muscle fiber dominance) and nutritional status (caloric sufficit, maintenance or deficit level, amount of protein and carb, etc, etc). You may grow doing 5x5 and you may not, depending how much you eat, what other training you are doing, how are you sleeping, etc.

What is the point of this? The point is that I am NOT negating the existence of repetition continuum, but rather I am trying to point out that it must be put into context (other training, athletes characteristic, nutritional status, recovery, etc). With the concurrent approach to strength training you are doing all mentioned methods (maybe not all of them, depending on your philosophy) and you are trying to develop all qualities at the same time. It is possible to develop muscular hypertrophy and strength, but it is near impossible (except for fat beginners and those coming from long lay off) to develop strength and fat loss and even more impossible to develop fat loss and muscle mass increase (without clenbuterol and AAS, anyway).

This is why I said the things must be put into context and they must be goal oriented for a given athlete. These 'problems' are universal to other methods too (sequential, alternating) not solely to concurrent. Concurrent method solves some drawbacks of sequential method ('use it or lose it' law), along with utilizing 'cross-over' effect between methods.

What I mean by this 'cross-over' effect is that doing ME training will increase number of reps or weight used during RE and SE training, and RE and SE training will provoke different stimuli to muscles and CNS (variety) along with increasing muscle mass which will in turn improve ME performance. Same thing with ME and DE method. Yet again, this may become negative 'cross-over' if recovery capacities of the athlete are exceeded, and RE/SE work may impair ME/DE performance and vice versa (as visible with advanced lifters). This is why smart planning with

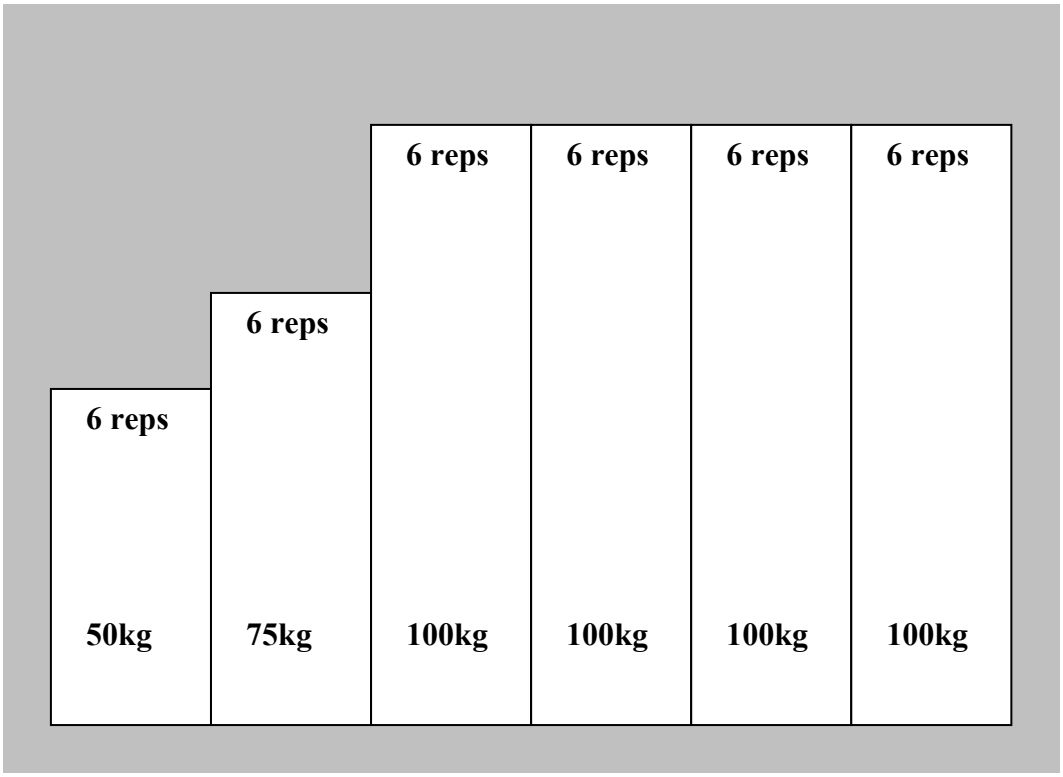
concurrent approach is a must, and after some time (with most advanced athletes) modified concurrent method must be used (emphasis switch and maintenance loads). More on this later.

If you are still reading this and you are not confused or sleepy, and since I described everything I needed to describe, I can start talking about different strategies toward implementing concurrent approach in real life strength training. Based on my current knowledge I can identify three groups of such strategies, namely:

1. **Rep Schemes**
2. **Daily Undulating Periodization (DUP)**
3. **Priority Lifts**

1. Rep Schemes

The most simple method of utilizing concurrent approach to training would simply be to do whole 'rep continuum' on a given exercise. In the following picture, there is an example of 'straight sets' (or sets across) which are most commonly used in strength training.

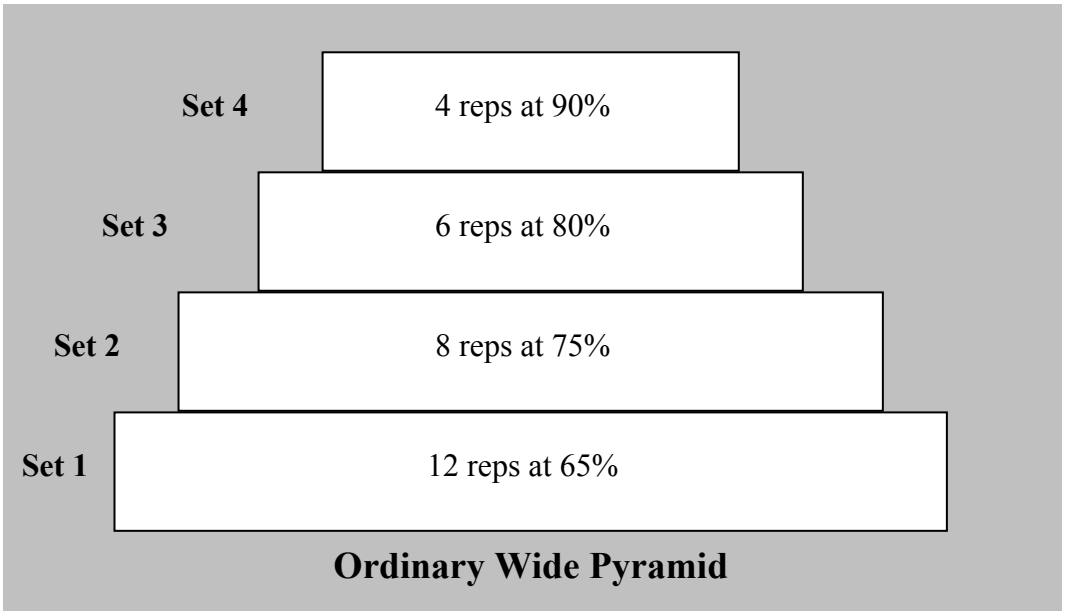


Straight sets or sets across utilize same number of reps with same weight used. They are very popular and famous for their strength increasing and muscular mass building effects. Some of the variations of the straight sets may be 'narrow pyramid', descending and ascending sets, narrow stages, narrow waves, etc. The only pre-requisite is that the load and the reps done STAY in the SAME rep-bracket (intensity zone) of the repetition continuum. This way the work is aimed at achieving only one adaptation effect (motor quality). Coach Charles Poliquin in his awesome book 'Reps and Sets' proposed a '10% rule', where he suggests that the load used in a given exercise should stay within 10% zone of 1RM. This way the only one adaptation effect is aimed for, and the body 'confusion' (when couple of adaption are aimed, exactly what I am about to explain next) is avoided.

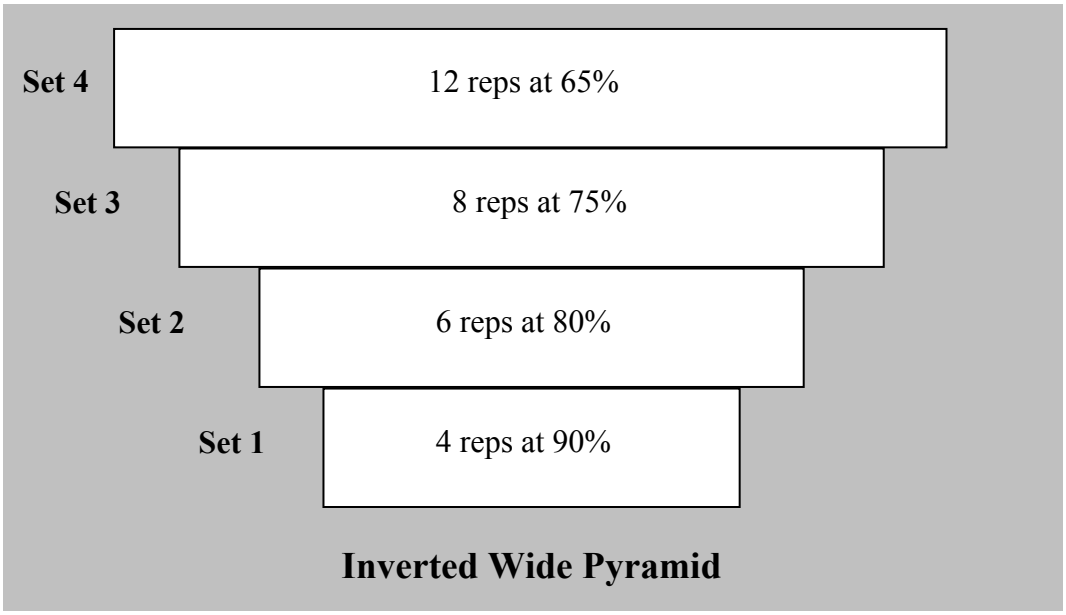
I don't know about you, but I noticed that straight sets are pretty boring, and I also noticed more and 'psychologically' easier gains in strength when some kind of rep and load fluctuations (loading protocols) are used, but that's just me. I also believe in Poliquin recommendation of 10% intensity zone. But some people don't. This is why they utilize most, if not all repetition continuum on a given exercise. The most common method to achieve this would be *wide pyramids*, *wide stages* and *wide waves*.

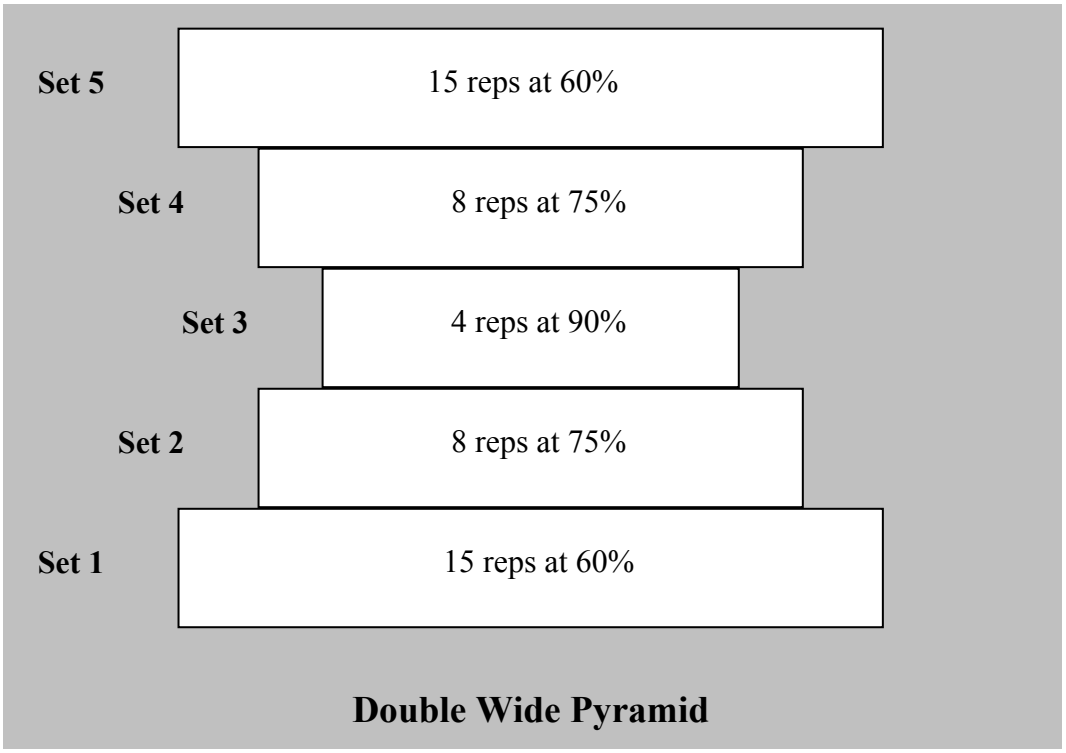
I must also note that great amount of lifters increased their strength and muscular mass utilizing straight sets (and being under 10% rule, without knowing it), but also great amount of them increased both their strength and muscular mass doing wide pyramids. Is their body 'confused'? Hell, I don't know!

The 'wide' variations of stages, pyramids and waves are based on utilizing whole (or most of) repetition continuum (or more than 10% load fluctuation). So, basically you do couple of sets in ME zone, couple of sets in SE zone, couple of sets in RE zone. How do you organize the stuff is actually what differs between those methods. But the common thing is that you do all the reps from repetition continuum and aiming at increasing maximal strength, muscular hypertrophy and muscular endurance at the same time, which is the major idea of concurrent training. In the following pictures there are examples of wide pyramids.



Ordinary Wide Pyramid





Waves are very much similar to pyramid. Here is the example of wide wave loading protocol.

Set	Reps
Set 1	15 reps
Set 2	10 reps
Set 3	5 reps
Set 4	15 reps
Set 5	10 reps
Set 6	5 reps

Stages or plateau loading are combination of pyramids and straight sets. Here are couple of an examples

Set	Reps
Set 1	15 reps
Set 2	15 reps
Set 3	10 reps
Set 4	10 reps
Set 5	5 reps
Set 6	5 reps

Set	Reps
Set 1	10 reps
Set 2	10 reps
Set 3	10 reps
Set 4	3 reps
Set 5	3 reps
Set 6	3 reps

For more examples regarding loading protocols I would highly recommend reading Christian Thibaudeau's 'Black Book of Training Secrets – Enhanced Edition' from which most of this graphs are taken. Another interesting book to consider would be Joe Kenn's 'Coach's strength training playbook' which is another awesome read.

My opinion regarding waves, pyramids and stages is that they are very useful when the load stays within 10% of 1RM. In another words: narrow variants are ok, while I think wide variants (those explained) are mostly crap (although gross amount of liters still use it; I guess they haven't read Zatsiorsky's book from 95' nor Poliquin stuff). It is ok if you utilize reps and loads from two near repetition zones (ME/SE, SE/RE), but if you try to utilize whole repetition continuum, I guess you are 'confusing' your body (whatever that would be). Also, you don't have appropriate volume within each zone to drain potential adaptation effects, compared to narrow variants. I again highly suggest looking at 'Black Book' for great ideas how to organize narrow variants for different level of athletes.

To conclude – Rep schemes (utilizing whole repetition continuum) on a given exercise, as a form of concurrent training is a BAD CHOICE. Avoid it.

2. Daily Undulating Periodization (DUP)

The idea of Daily Undulating Periodization (or what is also called non-linear periodization in some circles) is to basically devote a whole training session toward a given goal (maximal strength, muscular hypertrophy, muscular endurance, etc.). Suppose you have two different training sessions – Training A and Training B.

Training A	Training B
1. Squat	1. Front Squat
2. Bench Press	2. Inclined Bench Press
3. Romanian Dead Lift	3. Lunges
4. Pull-ups	4. Horizontal Rowing

Now, you identify different training goals you want concurrently (paralelly) achive at the same time. Suppose they are maximal strength, muscular hypertrophy and muscular endurance. For achieving them you plan to use ME, SE and RE method and loading protocols. Now you 'mix and match' and get this kind of training organization:

	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
Training	A	B	A	B	A	B
Protocol	ME	SE	RE	ME	SE	RE
Reps/Sets	5x1-3	4x6-8	3x10-12	5x1-3	4x6-8	3x10-12

Now you have six combinations of training sessions, combining Training A and B and combining three different loading protocols ME, SE and RE. If you do three training sessions per week you have two weeks to 'pass' the full circle.

This kind of planning allows for week loading waves (or undulations), that may provide variety and some kind of integrated unloading. There is couple of studies (which I am to lazy to find) showing better goal achievement with DUP than with Linear (or traditional) periodization. I don't want to open huge can of worms discussing the study design and subjects, but I guess this kind of concurrent training organization has its place under the Sun, for a given individual aiming to achieve specific goals under specific situation.

Coach Alwyn Cosgrove believes in DUP. I trust Alwyn Cosgrove. So, I guess I find DUP a good tool in your toolbox. Use it when you find it appropriate. To be honest, I haven't used it yet, nor on me, nor on people I coach, but that doesn't necessary mean I will not use it one day. Now, lets discuss 'priority lifts' strategy.

3. Priority Lifts

I openly admit – this is my favorite approach to concurrent strength training. I don't know did anyone called it 'priority lifts' before me, or does anyone know what the hell I am going to talk about here, but I gotta called it somehow. Since we are going to differ between different exercise categories and give them priorities, I hoped that calling this method 'priority lifts' was a smart idea. If you think it is not, be free to contact me and curse me.

According to its importance, each exercise can be classified into separate group. Depending on the author, there could be different classification of the exercises. For example Joe Kenn in his book 'The Coach's Strength Training Playbook' uses the following classification of exercises:

- Foundation Exercises
- Supplemental Exercises
- Major Assistance Exercises
- Secondary Assistance Exercises

One classification of exercises that I will use here, is the classification Christian Thibaudeau, presented in his series of articles entitled 'How to design a damn good program' published at t-nation.com site. If you haven't read this series of articles (and actually everything this guy has ever wrote), then you are missing a lot, because there is more practical info in those couple of pages than in 500+ pages strength training textbook. It is awesome article, one of my favorites.

Exercise Classification by CT	
Primary Exercises	This category includes a small number of multi-joint, multi-muscle, free-weight and preferably multi-plane movements. These movements allow you to use the most weight for each muscle group, and place the highest demand on the body and nervous system.
Secondary Exercises	Similar to the above, except that the exercises in this category place a slightly lower demand on the body and CNS.
Auxiliary Exercises	This very broad category includes the isolation movements and most machine exercises. These exercises allow the use of considerably less weight than exercises in the first two categories, and so place far less demand on the nervous system.
Remedial	This category contains movements, mostly isolation, whose purpose is to

Exercises	correct problems such as muscle imbalances or a very specific weak points. Rotator cuff work, balance and proprioception drills also fall into this category.

Basically, Joe Kenn and Chris Thibaudeau use the same classification with some minor differences between groups.

Most coaches usually reduce exercise classification to CORE and ASSISTANCE exercises which is more practical and easier to use. Again, everything depends on the goal of training and context, so does exercise classification you use. If exercises are tools, then their classifications can be different types and organizations of the toolbox. Be flexible with classifications, they are not set in stone.

According to your sport and goal, different exercises may be considered under given group. For example, Olympic lifter may use the following classification:

Olympic lifter	
Primary Exercises	Clean & Jerk; Snatch; Squat; Dead Lift; Press; Push press
Secondary Exercises	Hang Clean; Hang Snatch; High Pulls; Front Squat
Auxiliary Exercises	RDLs; Lunges; Step-Up; Bench Press; Chins; Rows; Shrugs
Remedial Exercises	Rotator Cuff; Adductors/Abductors; Calf; etc, etc.

This could be an example of exercise classification for a powerlifter:

Powerlifter	
Primary Exercises	Squat; Bench Press; Dead Lift
Secondary Exercises	Front Squat; Box Squat; Sumo Dead Lift; Good Morning; RDL; Wide/Narrow grip Bench Press; Military Press; Floor Press; Chains; Bands; Incline/Decline Bench Press
Auxiliary Exercises	Pull-Through; GHR; Lunges; Step-Ups; Rows; Chins; Bulgarians; Reverse Hyper; DB variations and isolation stuff (delts, triceps, biceps, calfs)
Remedial Exercises	Rotator-Cuff; Shoulder Stability work; TKE; etc

For an average athlete, looking for strength training, the following classification could be used:

Athlete	
Primary Exercises	Clean; Squat; Dead Lift; Bench Press
Secondary Exercises	Front Squat; RDLs; Lunges; Military Press; Chins; Rows; DB variations
Auxiliary Exercises	Dips; Delts; Calfs; Biceps; Triceps; Grip
Remedial Exercises	Shoulder, ankle and knee prehab; Neck

Please note that different classifications may be used depending on the weak and strong points of athlete, his level of development, training period, emphasis and other stuff.

Those classifications are used to help the coach to organize the training system and prioritize things according to the demands of sport and position. With average athlete, Primary Exercise would be those that gives the 'most bang for bucks' and have greatest transfer to field, while other exercises will aim to assist that transfer and provide whole body development (if that is your philosophy anyway) and injury prevention.

Since every exercise category can (or should?) have its own planning (different loading, progression and periodization plans for different exercise categories and their usage/rotation in training system), concurrent training can be easily achieved. For example, powerlifter would build explosive strength with DE box squats, chains and bands bench press and speed deadlifts, maximal strength with ME squats, presses and deadlifts and their special variations (secondary exercises) and muscular hypertrophy with SE and RE single-leg exercises and DB variations of presses, some chins and rows.

With average athlete, explosive strength would be developed with olympic lifts variations, plyos and explosive jumps, maximal strength with ME/SE squats, benches and dead lifts and muscular hypertrophy with SE/RE single leg stuff, DB variations, isolation stuff, chins and rows.

In other words, Primary Exercises may use ME loading protocol, Secondary Exercises may use SE loading protocol and Auxiliary and Remedial Exercises may use RE loading protocol to achieve concurrent training approach.

Concurrent Training with Priority Lifts		
Exercise Group	**Training Goal**	**Loading Protocol**
Primary Exercises	Explosive Strength; Maximal Strength	DE; ME
Secondary Exercises	Maximal Strength; Muscular Hypertrophy	ME; SE
Auxiliary Exercises	Muscular Hypertrophy; Muscular Endurance	SE; RE
Remedial Exercises	Muscular Endurance; Anatomic Adaptation; (pre)hab	RE

But if someone wants to nitpick (and that would be me), this can be considered concurrent training 'in a whole' (because all loading protocols are present) and may not be considered concurrent depending on which movement pattern or muscle groups we are talking about. For example, in mentioned athlete situation, legs would receive both explosive strength work, maximal strength work and muscular hypertrophy work. The situation is similar for upper body 'push' muscles, but upper body 'pull' muscles (used for chins and rows) will receive only muscular hypertrophy work. Ring a bell, or not?

To be considered 'totally' concurrent, in a training program all movement patterns must receive same treatment (ME, SE and RE work, not necessary DE), or it would be only 'partially' concurrent. For this reason most, if not all, concurrent powerlifting, olympic lifting and athletic training programs are 'partially' concurrent since only legs and push muscle groups receive 'concurrent treatment' with the exception of upper body pull muscles. Is this bad thing? Certainly NOT! I am just pointing it out, and since most sports revolve around legs and push muscles, this is fine situation for me.

But, in bodybuilding this would under-develop certain muscle groups, that's for sure. And since goals in athletic training, olympic lifting, powerlifting are not bodybuilding in nature, and since I don't talk about bodybuilding here (although some ideas can be certainly used with minor modifications) there shouldn't be much concern about it anyway.

Certainly, it would be very usable to classify exercises for every movement pattern (or muscle group) in addition to sport classification already explained. This way we could differ between:

- **Sport based or athletic-oriented classification** of exercises (according to greatest transfer to field, event; most used muscle groups/movement patterns in sport, etc)

- **Movement-pattern** or **muscle group** (bodybuilding) based **classification** of exercises

Since I already gave hypothetical examples of exercises classification for Olympic lifting, powerlifting and average athletic training, here is a modified exercises classification based on movement patterns taken from already mentioned awesome article by Christian Thibaudeau 'How to design a damn good program'.

Knee Dominant Pattern (or Quads)	
Category	**Sample Exercises**
Primary	Olympic back squat (hip width stance, upright torso), power squat (wide stance, moderate torso lean), front squat
Secondary	Lunge variations, split squat variations, leg press, barbell hack squat, dumbbell squat
Auxiliary	Machine hack squat, step-up variations, leg extension variations, sissy squat
Remedial	Terminal knee extension (with band), band leg extension

Hip Dominant Pattern (or Hams/Glutes)	
Category	**Sample Exercises**
Primary	Dead Lift, Romanian deadlift, stiff-leg deadlift, sumo deadlift, snatch grip deadlift
Secondary	Good morning variations, glute-ham raises, leg press (feet high on pad), single leg RDL
Auxiliary	Reverse hyper, pull through, leg curl variations, cable hip extension, hyperextension
Remedial	X-band walks, Cook lift, Swiss ball leg curl, band leg curl

Upper Body Horizontal Push (or Pecs)	
Category	**Sample Exercises**
Primary	Bench Press
Secondary	Incline bench press, DB bench press, DB incline press, neck press, plate loaded push-ups
Auxiliary	Cable cross-over, flies variations, pec deck machine, chest press machine
Remedial	Swiss ball push ups, wobble board push-ups

Upper Body Vertical Pull (or Back Width, Lats & Teres Major)	
Category	**Sample Exercises**
Primary	Pull-ups, chin-ups
Secondary	Parallel pull-ups, mixed grip pull-ups, towel pull-ups
Auxiliary	Lat-Pull down variations, straight arm lat-pull down, pull-over
Remedial	External/Internal shoulder rotation, scap push-up

Upper Body Vertical Push (or Shoulders/ Delts)	
Category	**Sample Exercises**
Primary	Military Press, push press
Secondary	Press behind the neck, log press, seated press, DB press variations, bradford press
Auxiliary	Machine shoulder press, lateral raise variations, front raise variations, lateral raise machine
Remedial	Cuban press, external shoulder rotation

Upper Body Horizontal Pull (or Back Thickness – rear delts, traps, rhomboids)	
Category	**Sample Exercises**
Primary	Barbell rowing, log row, chest supported rowing, seated rowing
Secondary	One-arm DB row, corner row, fatman pull-ups, DB chest supported rowing
Auxiliary	High pulley cross-rowing, low-pulley cross-row, bent-over rear delt raise, machine rear delt, chest-supported incline rear delt raise
Remedial	Chest-supported incline DB shrugs, seated cable shrugs (scapular retraction), traps 3 raise, YTWL, cuban row

Elbow Flexion (or Biceps)	
Category	**Sample Exercises**
Primary	Standing barbell curl, Scott bench barbell curl
Secondary	Hammer curl, seated DB curl variations, Scott bench dumbbell curl, reverse barbell curl (standing or Scott bench), Zottman curl
Auxiliary	Machine curl, cable curl variations,concentration curl
Remedial	Upper arm supination with sledgehammer or Thor's hammer

Elbow Extension (or Triceps)	
Category	**Sample Exercises**
Primary	Close grip bench press, close-grip decline press, triceps dips
Secondary	Close-grip incline press, reverse-grip bench press, JM press, decline barbell triceps extension, decline DB triceps extension, flat barbell triceps extension, flat DB triceps extension
Auxiliary	Overhead DB triceps extension, overhead bar triceps extension, cable triceps extension variations, triceps extension machines
Remedial	Close-grip push up on Swiss ball, close-grip push-up on wobble board

Total Body (Olympic Lifts)	
Category	**Sample Exercises**
Primary	Clean & jerk, snatch
Secondary	Hang clean, hang snatch, push press, pulls, shrugs
Auxiliary	Jump squats, depth jumps, split squat jumps, step-up jumps
Remedial	DB clean and snatch variations

Using this movement-pattern based exercise classification, different goals can be achived via different distribution of loading protocols. I will give an example using Chris Thibaudeau's classification of loading protocols.

Distribution of loading protocols according to the goal selected			
	Relative strength	**Absolute strength**	**Muscular Hypertrophy**
Primary	Strength	Strength	Functional Hypertrophy
Secondary	Strength	Strength; Functional Hypertrophy	Functional Hypertrophy; Total Hypertrophy
Auxiliary	Strength; Functional Hypertrophy	Functional Hypertrophy; Total Hypertrophy	Total Hypertrophy
Remedial	Strength Endurance	Strength Endurance	Strength Endurance

The training sessions for intermediate lifters can be easily designed using presented information. The attribute 'intermediate' is based on the work of Mark Rippetoe and Lon Kilgore, authors of 'Starting Strength' and 'Practical Programming' books, both of which are a must in your

training library. For more info please read my 'review' entitled 'What I have learned from Practical Programming Book' published at elitefts.com.

I will give two examples aimed at increasing both explosive strength (via Olympic lifts and explosive jumping), maximal strength and muscular hypertrophy, one based on Whole Body Split and another based on Lower/Upper Split. Here is the example of Whole Body Split:

Whole Body - Training Session A				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Auxiliary	*Step-up jumps*	DE
B.	Knee Dominant	Primary	*Squat*	ME
C1.	Vertical Push	Primary	*Military Press*	ME
C2.	Vertical Pull	Primary	*Chin-Ups*	ME
D.	Hip Dominant	Secondary	*Romanian DL*	SE
E1.	Horizontal Push	Auxiliary	*Push-Ups*	RE
E2.	Horizontal Pull	Auxiliary	*Cuban Row*	RE

Whole Body - Training Session B				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Primary	*Clean*	DE/ME
B1.	Horizontal Push	Primary	*Bench Press*	ME
B2.	Horizontal Pull	Primary	*Barbell Row*	ME
C.	Knee Dominant	Secondary	*Front Squat*	SE
D1.	Vertical Push	Secondary	*DB Press*	SE
D2.	Vertical Pull	Secondary	*Pull-Ups*	SE
E.	Hip Dominant	Auxiliary	*Single leg RDL*	RE

Whole Body - Training Session C				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Secondary	*Hang Clean*	DE/SE-*technique*
B.	Hip Dominant	Primary	*Dead Lift*	ME
C1.	Horizontal Push	Secondary	*DB Bench Press*	SE
C2.	Horizontal Pull	Secondary	*Seated Rowing*	SE
D.	Knee Dominant	Auxiliary	*Lunges*	RE
E1.	Vertical Push	Auxiliary	*DB L-rises*	RE
E2.	Vertical Pull	Auxiliary	*Pull-over*	RE

And here it is Lower/Upper Split:

Training A – Lower Body Squat				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Primary	*Clean*	DE/ME
B.	Knee Dominant	Primary	*Squat*	ME
C.	Hip Dominant	Secondary	*Romanian DL*	SE
D.	Knee Dominant	Auxiliary	*Lunges*	RE
E.	Abs and pre-hab stuff			RE

Training B – Upper Body Horizontal				
	Movement Pattern	Category	Example	Loading Protocol
A1.	Horizontal Push	Primary	*Bench Press*	ME
A2.	Horizontal Pull	Primary	*Barbell Row*	ME
B1.	Vertical Push	Secondary	*DB Press*	SE
B2.	Vertical Pull	Secondary	*Pull-Ups*	SE
C1.	Horizontal Push	Auxiliary	*Push-ups*	RE
C2.	Horizontal Pull	Auxiliary	*Cuban Row*	RE

Training C – Lower Body Dead Lift				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Secondary	*Hang Clean*	DE/SE-technique
B.	Hip Dominant	Primary	*Deadlift*	ME
C.	Knee Dominant	Secondary	*Front Squat*	SE
D.	Hip Dominant	Auxiliary	*Single Leg RDL*	RE
E.	Abs and pre-hab stuff			RE

Training D – Upper Body Vertical				
	Movement Pattern	Category	Example	Loading Protocol
A1.	Vertical Push	Primary	*Military Press*	ME
A2.	Vertical Pull	Primary	*Chin-Ups*	ME
B1.	Horizontal Push	Secondary	*DB Bench Press*	SE
B2.	Horizontal Pull	Secondary	*Seated Rowing*	SE
C1.	Vertical Push	Auxiliary	*L-rises*	RE
C2.	Vertical Pull	Auxiliary	*Pull-over*	RE

Once we arranged the training sessions, we can plan progressions for loading protocols. For example:

Weekly Progressions for loading protocols				
Loading Protocol	**Week 1**	**Week 2**	**Week 3**	**Week 4 Unload**
ME	5x3	3,2,1,3,2,1	6x1	4x1 -10% weight
SE	4x6	5x5	5x5	3x5 -10% weight
RE	3x12	3x10	3x8	2x10
Olys	ME: 5x1 SE: 4x2 RE: 3x5	ME: 5x1 SE: 4x2 RE: 3x5	ME: 5x1 SE: 4x2 RE: 3x5	ME: 5x1 SE: 4x2 RE: 3x5

Different types of weekly progressions can be implemented, with or without unload period. You can use modified Poliquin accumulation/Intensification scheme for ME and DUP for SE, to name a few. You could also use narrow pyramids, waves, stages, whatever cross your mind and that allows increase in defined goals concurrently and avoidance of injury and overtraining. Please note that the mezocycle (usually one month) progressions depends on goals, context and the level of the athlete, so don't get too creative. Keep it simple stupid. KISS.

One may also implement Starr Texas Method into proposed system. For example, for ME work one will do Primary Lifts in 1x5 scheme (ramp-up) and for SE work one would also do primary lifts but for 5x5 (sets across). For RE work one may do secondary/auxiliary exercises with less weight as recovery. This scheme uses Intensity/Volume/Recovery instead of ME/SE/RE and it

is not considered concurrent training, so it is not the subject of this article, but I am still going to present modified system (just to show it can be done). Here is modified Whole Body Split:

Whole Body - Training Session A				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Auxiliary	*Step-up jumps*	DE
B.	Knee Dominant	Primary	*Squat*	Intensity (1x5)
C1.	Vertical Push	Primary	*Military Press*	Intensity (1x5)
C2.	Vertical Pull	Primary	*Chin-Ups*	Intensity (1x5)
D.	Hip Dominant	Secondary	*Romanian DL*	Recovery
E1.	Horizontal Push	Auxiliary	*Push-Ups*	Recovery
E2.	Horizontal Pull	Auxiliary	*Cuban Row*	Recovery

Whole Body - Training Session B				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Primary	*Clean*	DE/ME
B1.	Horizontal Push	Primary	*Bench Press*	Intensity (1x5)
B2.	Horizontal Pull	Primary	*Barbell Row*	Intensity (1x5)
C.	Knee Dominant	Primary	*Squat*	Volume (5x5)
D1.	Vertical Push	Primary	*Military Press*	Volume (5x5)
D2.	Vertical Pull	Secondary	*Pull-Ups*	Volume (5x5)
E.	Hip Dominant	Auxiliary	*Single leg RDL*	Recovery

Whole Body - Training Session C				
	Movement Pattern	Category	Example	Loading Protocol
A.	Total Body	Secondary	*Hang Clean*	DE/SE-*technique*
B.	Hip Dominant	Primary	*Dead Lift*	Intensity (1x5)
C1.	Horizontal Push	Primary	*Bench Press*	Volume (5x5)
C2.	Horizontal Pull	Primary	*Barbell Rowing*	Volume (5x5)
D.	Knee Dominant	Auxiliary	*Lunges*	Recovery
E1.	Vertical Push	Auxiliary	*DB L-rises*	Recovery
E2.	Vertical Pull	Auxiliary	*Pull-over*	Recovery

As I have pointed out earlier, this concurrent solutions will work very well with intermediate lifters. Some of the characteristics of intermediate lifters are the following (taken from my review article entitled 'What I have learned from practical programming book'):

1. **They progress from week to week (hit PRs) due greater need for recovery**
   - This is why ME is done only once per week for a movement pattern

2. **They need regular off-days during a week or within-week load fluctuations (wave-like)**
   - The DE/ME/SE/RE rotations within a week provide variety and 'unload' (in some cases), also the Lower/Upper split provides this kind of 'unload' during a week
   - This doesn't necessary mean total 'unload', but rather unload for a particular movement pattern

3. **They need longer unload (mostly a week) with greater reduction in load**
   - Unloading week every 4-6 weeks may be benefical
   - Dave Tate gave the following 'recommendations' in one of his Q&A at elitefts.com:

Loading protocol	Average Cycle Length	Deload
Dynamic Work (DE)	3-4 weeks	after one or two cycles
Max Effort Work (ME)	1-3 weeks	every 3 to 6 weeks
Supplemental Work "Main" (ME/SE)	5-8 weeks	every 8 to 10 weeks
Supplemental "Hypertrophy" Work (SE/RE)	N/A	every 6-8 weeks
Accessory Work "Prehab" (RE)	8-12 weeks	every 8-12 weeks

- Average cycle is the duration of the usage of specific exercise. After this cycle the exercise rotates and the lifter uses another exercise from movement pattern group.
- Please note that those numbers are just estimates and they will be different for everyone because we all have different recovery needs and training backgrounds. (*Dave Tate*)
- Some abilities may be de-loaded while others are being pounded. This should be the way most of the year goes. (*This is further discussed later in this article*). Before a meet or when worn down a full blown de-load should take place. A full blown de-load will involve de-loading all abilities. (*Dave Tate*)..
- The 'art' of deloading is a topic for itself, and I guess Eric Cressey did a fine job explaining it in his new manual entitled 'The Art of the Deload Special Report', although I haven't read it yet.

4. **They can use larger number of exercises and their variations**
   - This is why usage of Primary, Secondary, Auxiliary and Remedial exercises has its place

For beginners, this is too complex. They can improve at much faster rate and with less complexity with beginner programs, which utilize only Primary lifts with higher frequency during a week (they can hit PBs every time they take the bar) with much less volume.

Luckily for me, almost every team sport athlete never exit the intermediate stage. This is because their other obligations (skill work, speed work, plyometrics, general and specific conditioning) and different priorities limit the strength increase compared to iron sport athletes.

Advanced athletes are notorious because of their following characteristics:

1. **They cannot develop everything at once. They need to prioritize the training goals or they will suffer from overtraining and limited progress**
2. **The cumulative/delayed training effects of series of workouts becomes more and more important**
3. **Training must be organized into longer periods of time, and those periods progress from higher volume and lower intensity toward lower volume and higher intensity**

Before I write anything here, I must openly admit that I haven't had a chance to work with advanced lifters yet, so the text that follows is my 'opinion' based on other people work (as is most of the text anyway) and not my own 'experience'. Have that on your mind if you keep reading.

One would be also advised to explore the Block Training (Conjugate Sequence System). Although it is sequential in its nature (and also criticize concurrent, or mixed training) it is a valid form of training for advanced athletes that utlize cumulative/delayed training effects and training residuals. I suggest reading Vladimir Issurin article 'Block periodization *versus* traditional training theory: a review' published at *J Sports Med Phys Fitness 2008;48:65-75*. In my opinion it is far more readable and understandable than most Verkhoskansky's stuff.

In mentioned programs for intermediates, lifters seek to improve everything at once: Olympic lifts, squat, deadlifts, benches, chins, presses and rows, while also pounding secondary and auxiliary movements for muscle mass. This will work for a decent ammount of time (if the week structure is optimally organized based on athletes adaptability and recoverability), but after some time you will soon find out that you cannot do everything at once. Trying to increase Clean performance will leave you fatigued for squats. Squats will leave you fatigued for presses, etc, etc. This is the time when you need to prioritize your training, **you need to focus on couple of things while maintaining others** (unless you utilize Block Training where you are using training residuals instead of maintaining them). This is the basis of Emphasis Method (Modified Concurrent training)

In my humble opinion there are three things that may direct 'prioritization' in strength training:

1. **Movement pattern.** One may decide to pursuit Olympic lifts (or Clean, or Snatch, or Jerk), one may decide to concentrate on improving his bench press, or one may decide to concentrate on his deltoids development. In bodybuilding world this is called 'muscle specialization'.

2. **Physical quality.** One may decide to pursuit relative strength and maintain his hypertrophy, or one may maintain fat levels and strength while aiming for maximal muscular hypertrophy, etc, etc.

3. **A combination.** One may decide to pursuit his speed in his bench press and work on his sticking point, while also maintaining strength and hypertrophy in his pecs and the rest of his body.

Lyle McDonald, a guy that I quoted earlier, in his article 'Periodization for Bodybuilders' presented a loading guidelines for loading and maintaining different strength qualities:

Lyle McDonald's Loading Guidelines		
Type	**Training load**	**Maintaining load**
Strength training	6-10 sets	2-3 sets
Intensive bodybuilding	2-8 sets	1-2 sets
Extensive bodybuilding	3-6 sets	1-2 sets
Really Extensive	1-2 sets	1 set

Certainly this depends on a lot of factors, like the level of lifter, number of exercises per movement pattern/muscle group, etc, etc. But you get the point. Thanks Lyle.

Implementing this idea would be pretty easy. For example a lifter may use couple of training blocks (note the similarity with block training? Do not let me confuse you, because this is not Block training *per se*, although there are some similar points) to develop muscular endurance, muscular hypertrophy and maximal strength.

Emphasis Method			
	Block #1	**Block #2**	**Block #3**
Emphasis	Muscular Endurance (RE)	Muscular Hypertrophy (SE)	Maximal Strength (ME)
Maintenance	Muscular Hypertrophy (SE)	Maximal Strength (ME)	Muscular Hypertrophy (SE)
Maintenance	Maximal Strength (ME)	Muscular Endurance (RE)	Muscular Endurance (RE)
Loading recommendations	ME: 2-3 sets of 1 reps over 90% 1RM SE: 1-2 sets RE: 3-6 sets	ME: 2-3 sets of 1 reps over 90% 1RM SE: 2-8 sets RE: 1-2 sets	ME: 6-10 sets SE: 1-2 sets RE: 1-2 sets

Weekly progressions can be utilized for ME/SE/RE loading protocols for each training block and easily implemented into Whole Body Split and Lower/Upper body split example I gave earlier. This would allow advanced lifter to concentrate on a given physical quality, while maintaining others without overtraining and limited progress.

Another solution for a powerlifter would be to devise special blocks toward improving squat, deadlift and bench press.

Example for advanced powerlifter			
Block #1	**Block #1**	**Block #2**	**Block #3**
General Bulking	Squat	Bench Press	DeadLift
▪ Increasing whole body muscle mass and GPP ▪ Maintaining ME qualities in bench, squat and DL with maintenance loads	▪ Aiming at increasing ME, SE, RE in squat ▪ Maintaining strength in bench and deadlift ▪ Maintaining muscle mass and GPP	▪ Aiming at increasing ME, SE, RE in bench press ▪ Maintaining strength in squat and deadlift ▪ Maintaining muscle mass and GPP	▪ Aiming at increasing ME, SE, RE in deadlift ▪ Maintaining strength in squat and bench press ▪ Maintaining muscle mass and GPP

It is pretty easy for me to get 'creative' with this emphasis switch utilizing training loads and maintenance loads, but once again I must repeat: I haven't done this yet! Take my words with caution.

Another solution that can be utilized with advanced lifters is based on volume/intensity interaction. Accumulation phases (where the aim is to accumulate training volume and elicit cumulative/delayed training effect) may rotate with Intensification phases (where the aim is to express delayed training effects and utilize maximal training intensity with lowered volume). This is pretty much simmilar with Volume/Recovery/Intensity solution from Starr/Texas Method for intermediate athletes, although with intermediates we are talking about workouts, and here we are talking about weeks and even months. The more advanced the lifter, the longer the durations of the phases.

Accumulation/Intensification with no emphasis				
Strength Quality	**Phase 1 Accumulation**	**Phase 2 Intensification**	**Phase 3 Accumulation**	**Phase 4 Intensification**
ME	6x3	1x3	8x1	1x1
SE	5x7	1x7	5x5	1x5
RE	4x12	1x12	3x10	1x10

I guess this may kill someone, so we could rotate between Accumulation/Intensification for a particualar strength quality:

Accumulation/Intensification with no emphasis				
Strength Quality	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
ME	Accumulation 6x3	Intensification 1x3	Accumulation 8x1	Intensification 1x1
SE	Intensification 1x7	Accumulation 5x7	Intensification 1x5	Accumulation 5x5
RE	Accumulation 4x12	Intensification 1x12	Accumulation 3x10	Intensification 1x10

Advanced athletes may use 1-2 weeks phases, while the most advanced athletes may use longer phases up to 4-6 weeks to accumulate and express strength potential.

In addition, classical linear scheme (higher volume/low intensity to low volume/high intensity) may be used in ME block. This is just an example.

Linear scheme in ME block				
Quality	**Week 1**	**Week 2**	**Week 3**	**Week 4**
ME	7x5	6x4	5x3	4x2
SE	3x6-8	3x6-8	2x6-8	2x6-8
RE	2x10-15	2x10-15	1x10-15	1x10-15

Various other schemes may be developed for advanced athletes utilizing mentioned three requirements. For more valuable information I would suggest looking at Mark Rippetoe's 'Practical Programming' book. For me, I fulfilled my need to 'spare my wisdom' although I haven't tried this advanced stuff yet, but I love to have pre-planned plan of action if I find myself in that situation. Maybe I won't use it as written here, but I guess it is ok to have some starting opinion and solution from which you build after, depending on the situation and experience. As Mark pointed out in his book, the programming of strength training for advanced athletes is so complex that it must be approached individually without any generalizations, and to be honest, talking about programming for advanced athletes is way out of my league – I deal with bunch of kids who can't even squat well.

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