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Advance Methods in Triphasic Training

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University of Minnesota

Olympic Sport Strength Coach

30 BIG TEN Titles

10 National Champions

Over 400 All Americans

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Advance Methods in Triphasic Training

- A Brief Review
- Newest Methods
 - Supra-Maximal
 - [High Velocity Potentiation Clusters](#)
 - [Biochemical Adaptation](#)

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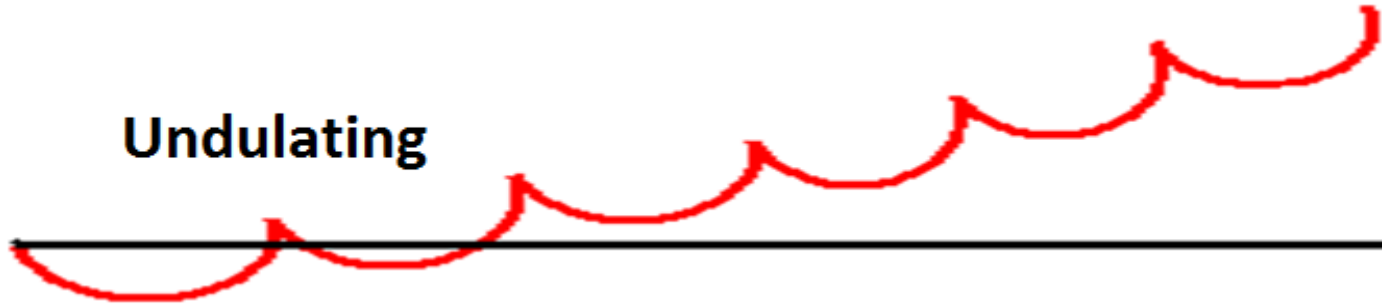
Organizing Peaking Training

Periodization vs. Undulating Model

Classic linear



Undulating



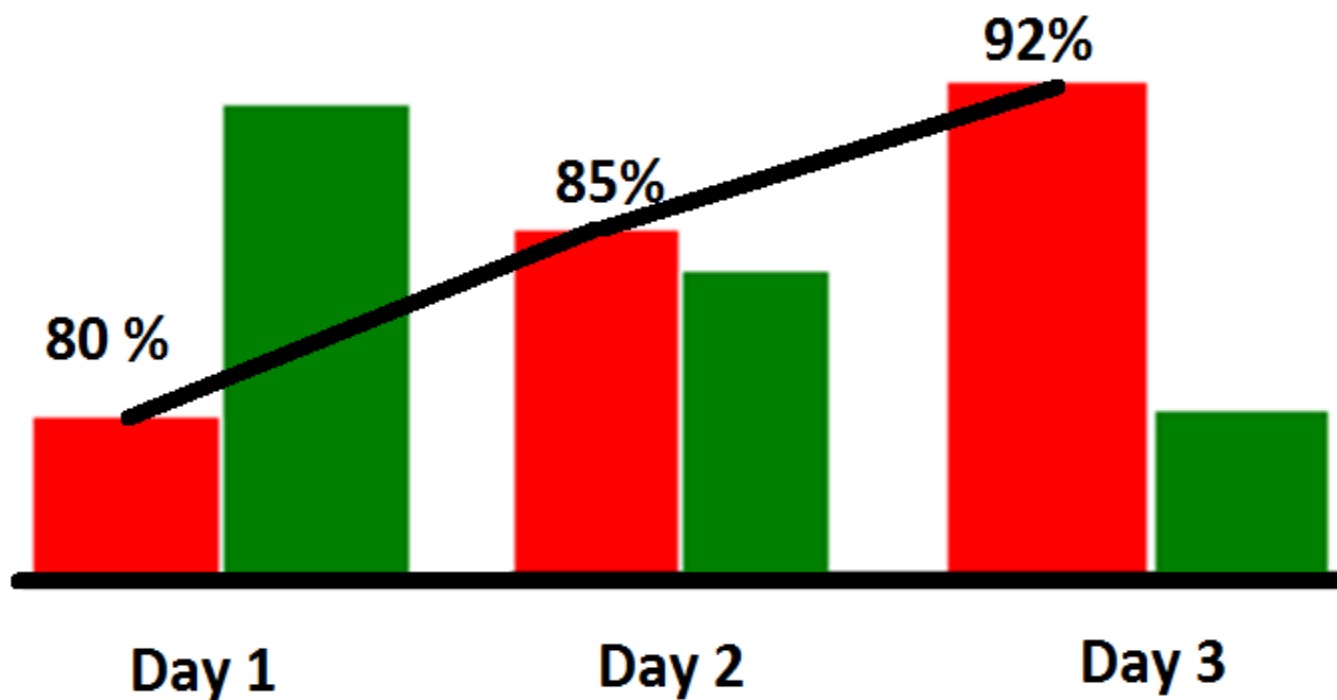
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Organizing Weekly Training

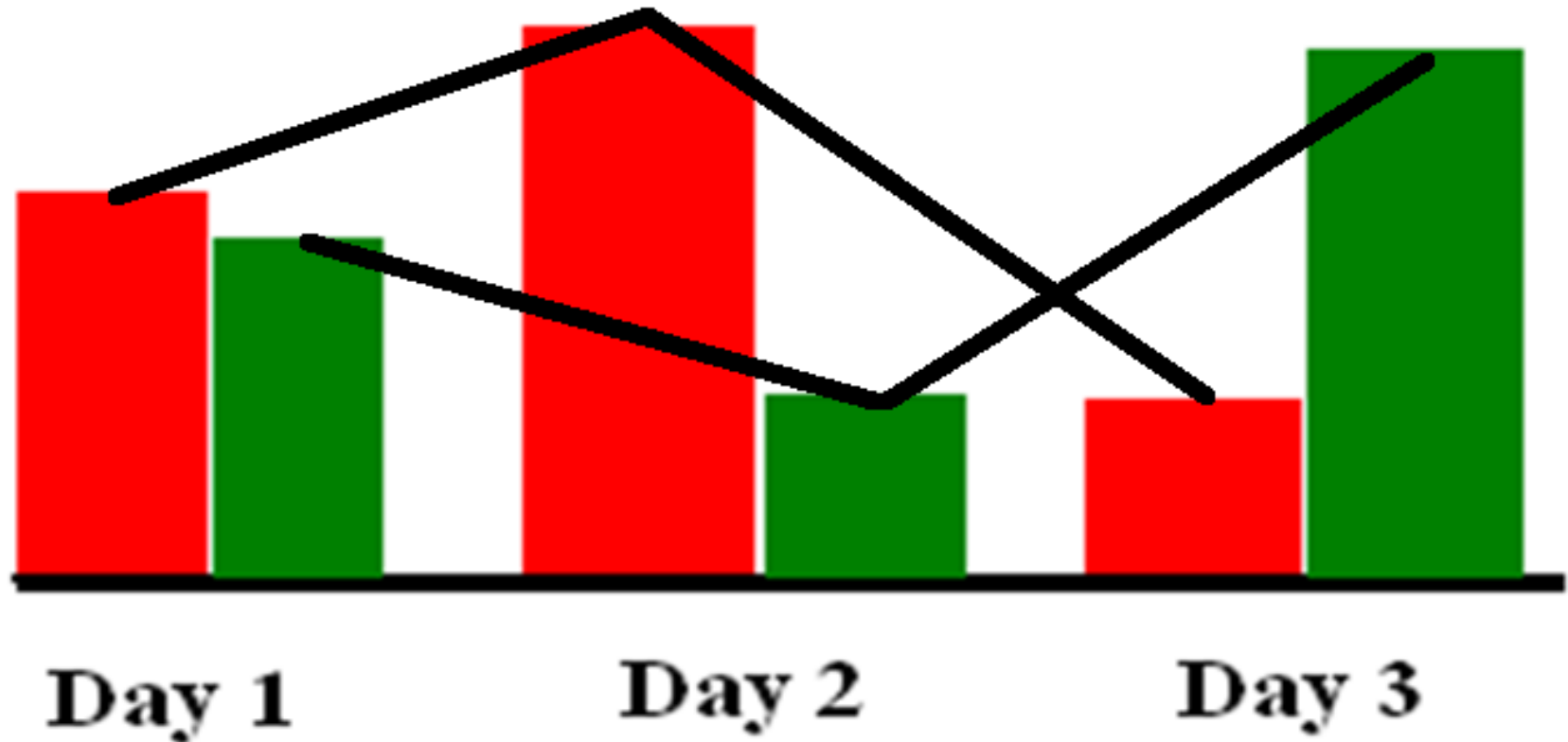
Classic Undulating Model



Intensity / Load

Volume = Green

Shifted – Day 1 goes to 3

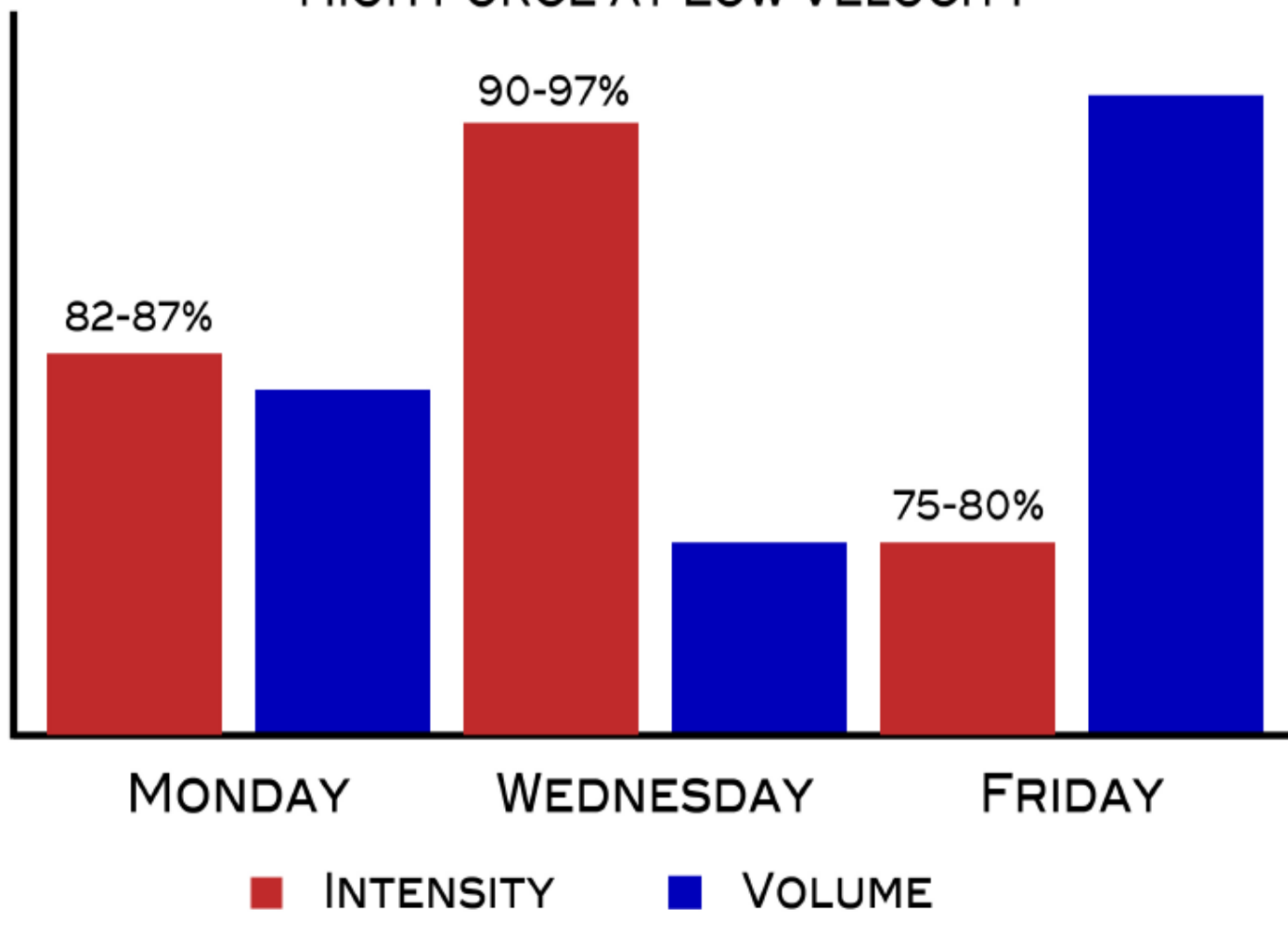


Intensity / Load

Volume = Green

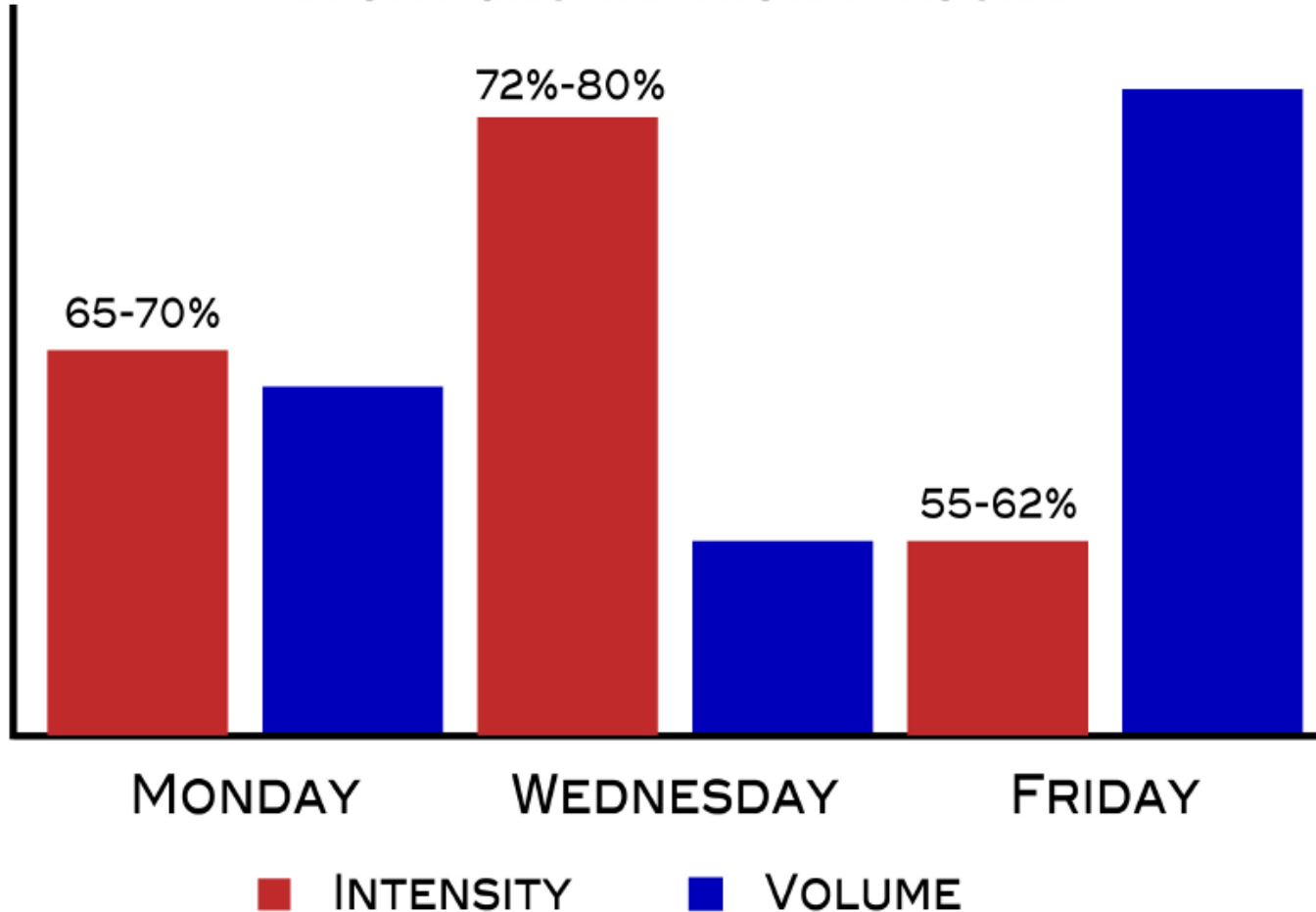
High Force at Low Velocity

ABOVE 80%
HIGH FORCE AT LOW VELOCITY



High Force at High Velocity

80% - 55%
HIGH FORCE AT HIGH VELOCITY



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Undulated Versus/ Traditional Block

- Method 1
 - 6 Straight workouts over 2 weeks at 85% Load
- Method 2

	Monday	Wednesday	Friday
Week 1	85% load	92% Load	80 % load
Week 2	85% load	92% Load	80 % load

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Undulating Periodization

- Undulating periodization involves the acute variation of volume and intensity on a weekly (microcycle) or daily basis.

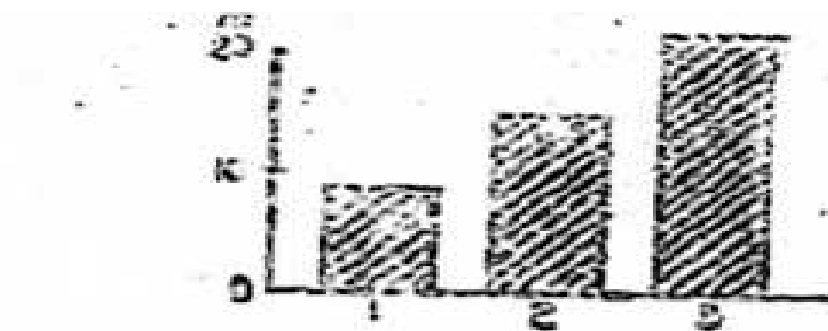
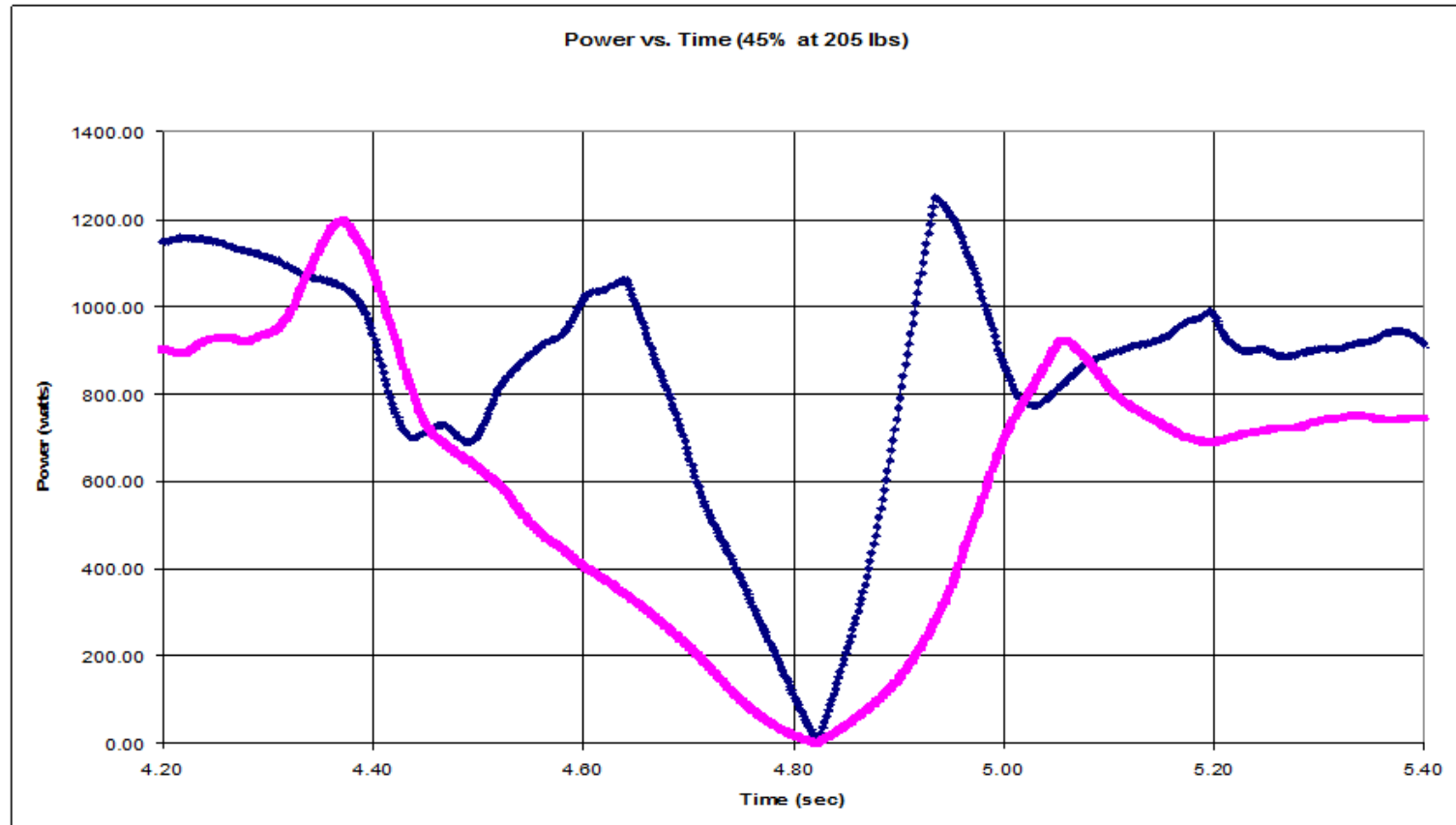


Figure 20: Increase in power in the vertical jump in place after 6 weeks of training with various weights: 1) 50% of maximum. 2) 90% of maximum and 3) combination of 90% and 50% of maximum.

Triphasic Action

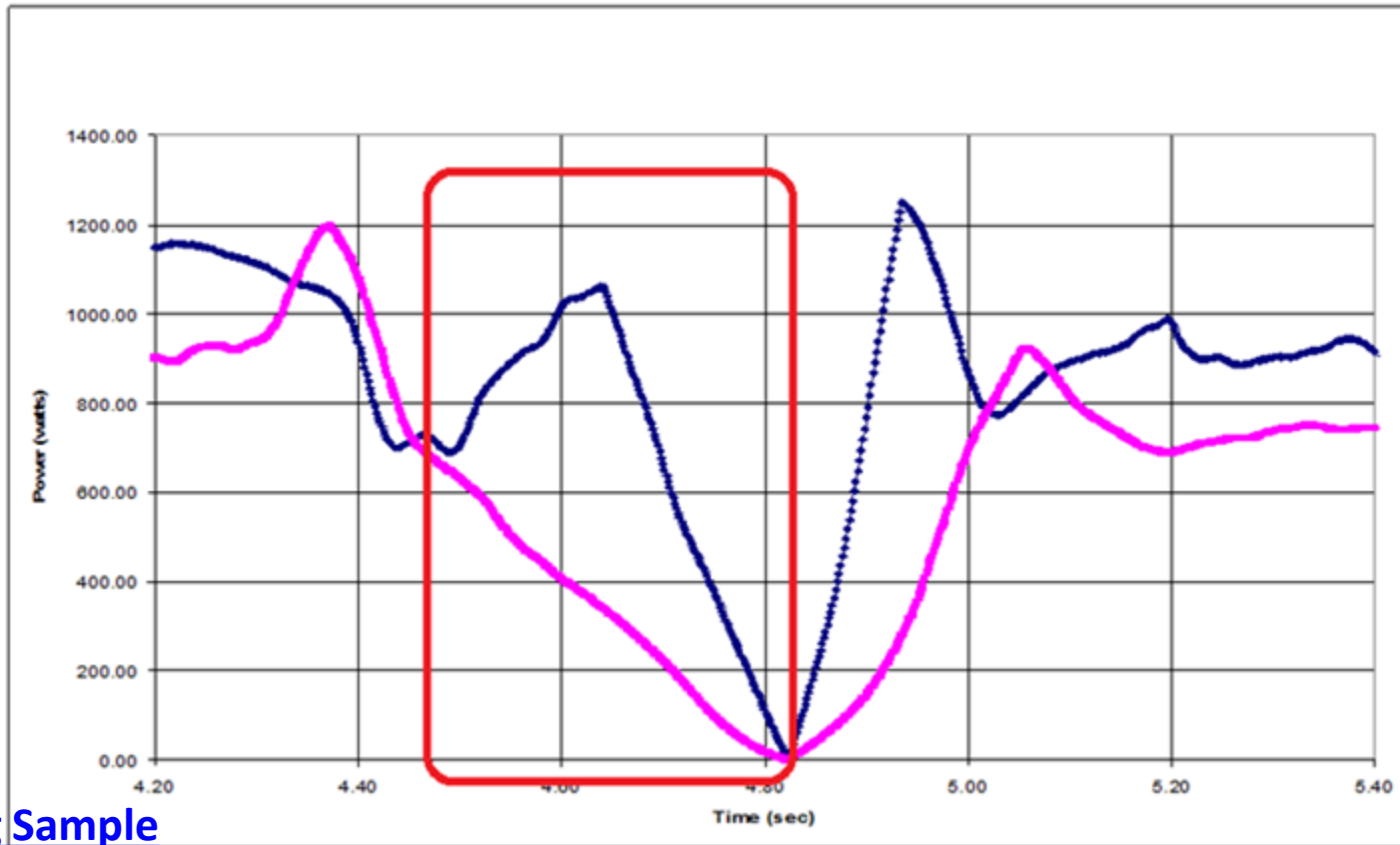


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Eccentric Phase



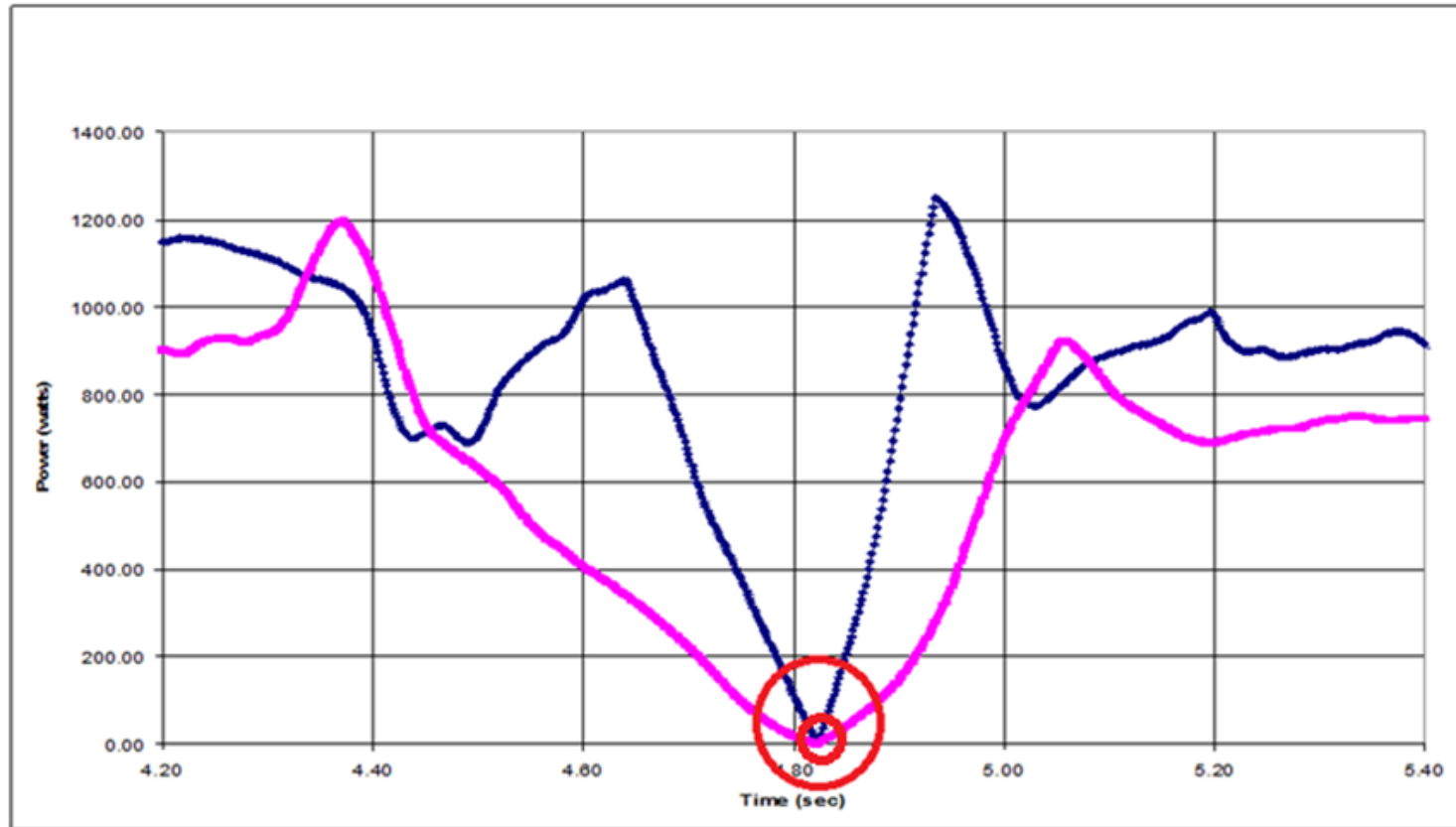
Throwing Sample

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Isometric Phase

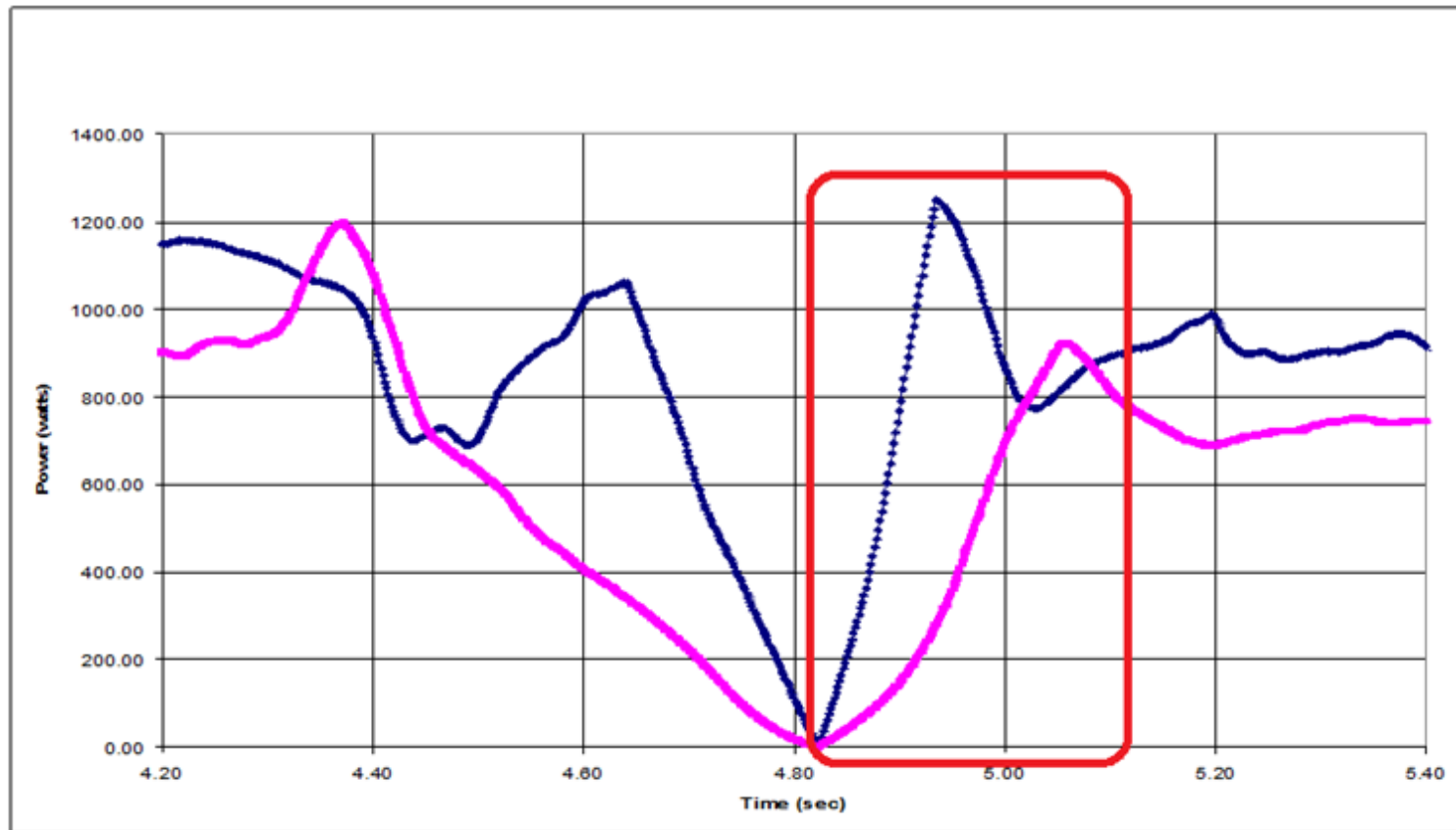


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Concentric Phase



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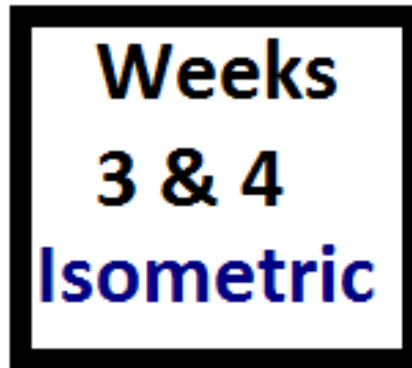
Tri-Phasic Undulating Block Method – Squat Example

Block 1



Eccentric
Squat
6:0:0:0

Block 2



Isometric
Squat
0:3:0:0

Block 3



Explosive
Squat
0:0:0:0

Technique : Ecc , Iso , Con

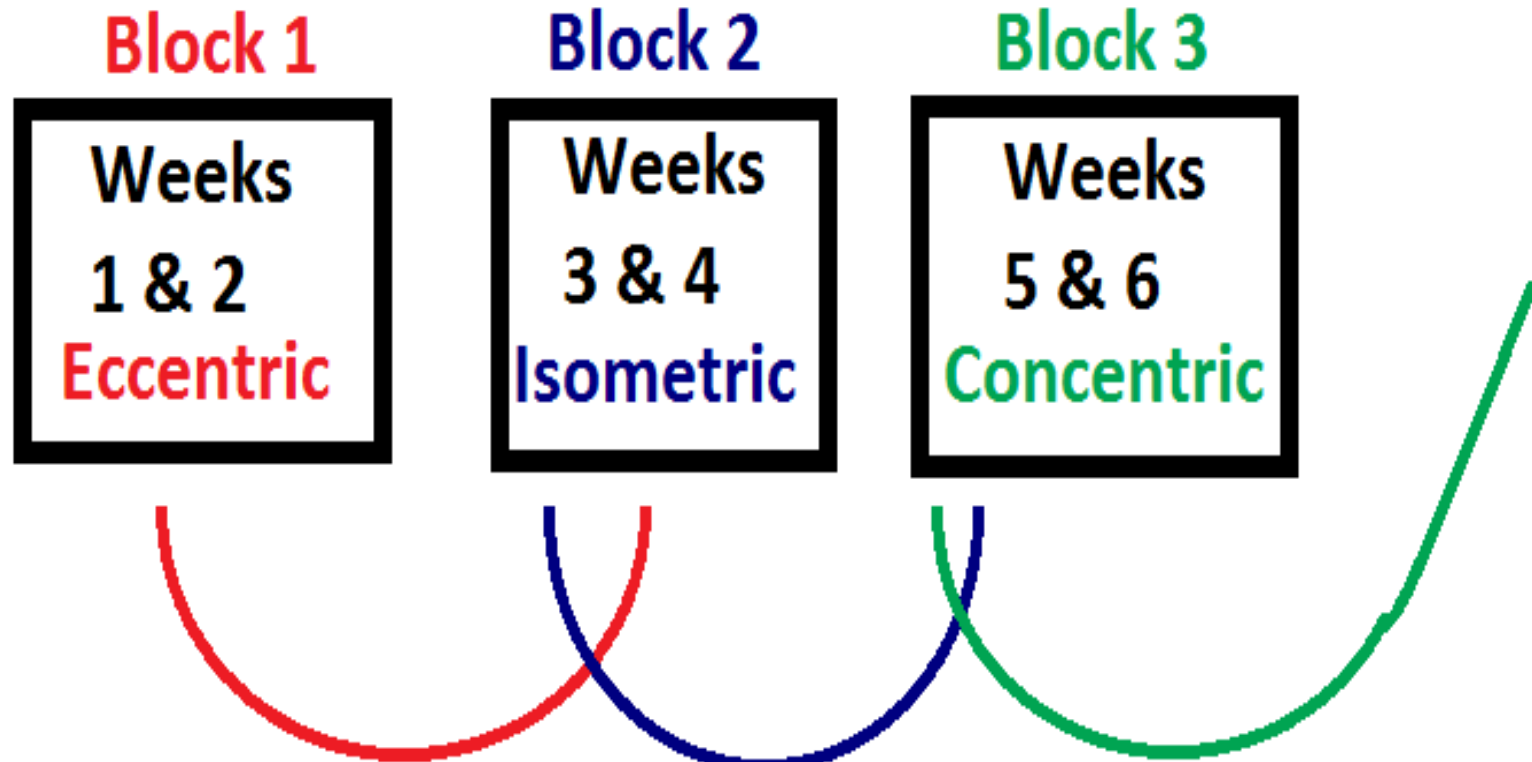
[Throwing Sample](#)

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Tri phasic Undulating Block Method - Peaking



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Most Advanced Method

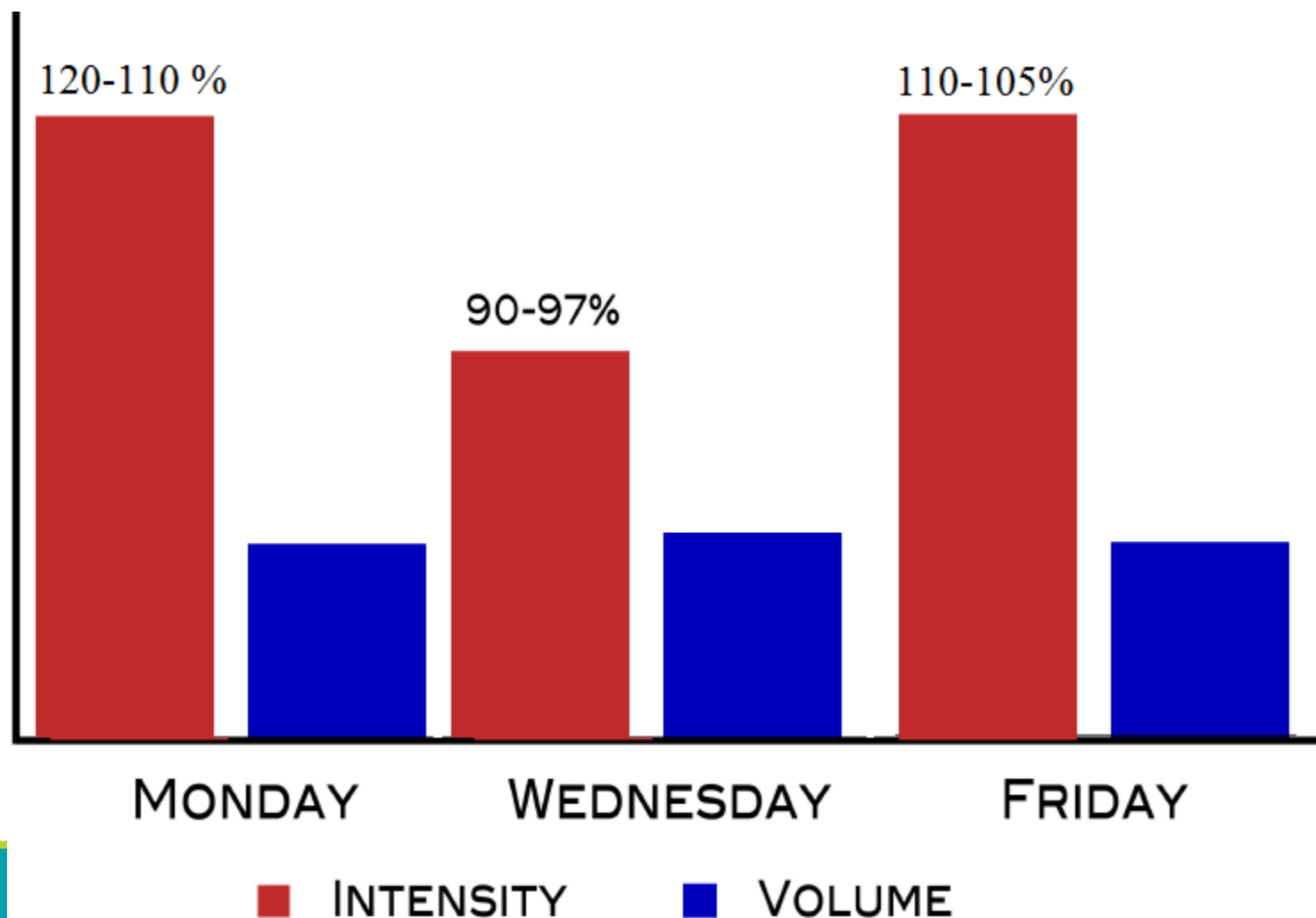
- Supra-maximal Loading
- 120 to 100 % + Loading During Eccentric/Isometric
- Most Effective Results in Speed and Reactiveness
- Compressed Training Effect

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Supramaximal Loading



Example of the Methods

- Safety Bar Single Leg Squat – [Ecc](#) – [Iso](#)
 - Concentric Movement is 80 to 92% Load Blk3
 - Spotter Used on Both Sides and Back
 - Safety Pins are Positioned so only 5 or 6 inches Drop if lift is Missed.
 - Examples Females 136 pounds – Single leg 305
 - Examples Male 190 pounds – Single leg 585
500/10 sec

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Weekly Block Loading Model

Block Focus	Monday		Wednesday	Friday	
Block 1-2 Weeks	Loading Day 1		Loading Day 2		Loading Day 3
Eccentric	120-110%		90-92%		110-105%
Block 2-2 Weeks	De-load week		De-load week		De-load week
Isometric	120-110%		90-92%		110-105%
	De-load week		De-load week		De-load week
Block 3-2 Weeks					
Con- Strength	85%		90-92%		85%
Con- Speed	65%		80%		55%

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Various Aspects of Supramaximal

- Strength for powerlifting movements
- Strength for sport—Enzyme
- Maximal Muscle Recruitment
- Maximal Fast Twitch
- Taxing on CNS
- Hyperplasia of myofibrils in muscle fibers
- Increase in free creatine in muscle fibers
- Increase concentration of hydrogen ions if duration enough and or rest reduced
- Hyperplasia of myofibrils in fast muscle fibers
- Negatives
- Joints and safety , tissue damage

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Male 3 day Model – French Contrast

474	SL Safety Squat	5	215 - 260	1	
	Pair w/				
474	SL Safety Squat	3	280 - 310	1	
	Pair w/				
474	SL Safety Squat	1	370 - 380	1	
474	SL Safety Squat	1	425 - 450	1	
	Pair w/				Partners Help
474	SL Safety Squat	T	520 - 570	4	7:0:0:10:7:0
					2 Cluster Cycle
	Hurdle Hop	4	\$N/A .. \$N/A	4	Height
	Pair w/NO REST				
	SQ Jump Weighted	4	\$N/A .. \$N/A	4	0:1:0:0:0:0
	Pair w/NO REST				
	Acc Band Jump Pause	4		4	0:1:0:0:0:0

Safety Squat	340 - 415	1	
Pair w/			
Safety Squat	3	445 - 495	1 0:6:0:0:6:10
Pair w/			
Safety Squat	1	590 - 605	1
Safety Squat	T	680 - 700	4 0:0:0:0:5:10
Pair w/	ED		
Safety Squat	T	680 - 700	4 0:0:0:0:5:10
	EU		

SL Safety Squat	215 - 260	1	
Pair w/			
SL Safety Squat	3	280 - 310	1 Fly 60
Pair w/			
SL Safety Squat	1	370 - 380	1
SL Safety Squat	1	425 - 450	1
Pair w/	ED		Partners Help
SL Safety Squat	T	520 - 570	4 10:0:0:10:10:0
	EU		1 Cluster Reps
Hurdle Hop	4	\$N/A .. \$N/A	4 Height
PW / no Rest			Pause
USSR Plyo Box	4	\$N/A .. \$N/A	4 Pause
PW / no Rest			Rest
Acc Band Jump Pause	4		4 Rest HR 110

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My Sample Program

Video Split Squat
Safety Bar

Accelerated Band
Jumps

Reading My Sheets

	REPS	LOAD	SETS	NOTES
SL Safety Squat	5	160 - 195	1	
Pair w/				
SL Safety Squat	3	210 - 230	1	
Pair w/				
SL Safety Squat	1	275 - 285	1	
SL Safety Squat	1	320 - 340	1	
Pair w/				Partners Help
SL Safety Squat	T	390 - 425	4	7:0:0:10:7:0
				2 Cluster Cycle
Hurdle Hop	4	\$N/A .. \$N/A	4	Height
Pair w/NO REST				
SQ Jump Weighted	4	\$N/A .. \$N/A	4	0:1:0:0:0:0
Pair w/NO REST				
Acc Band Jump Pause	4		4	0:1:0:0:0:0
4 way neck	T	\$N/A .. \$N/A	3	0:7:0:0:7:20
PW / 45 rest/BB/RT	EU			7 sec 2-way
Bench Add Groin	T	\$N/A .. \$N/A	3	0:7:0:0:7:20
PW / 45 rest/BB/RT	EU			
ANT TIB BND	T		3	0:7:0:0:7:10

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Potential Clusters

- French Contrast Model
 - Exercise Selection
 - Acceleration/ Top End Speed
 - Bio Chemical Aspect of Method
 - Various Samples

SL Safety Squat	T	520 - 570	4	7:0:0:10:7:0
				2 Cluster Cycle
Hurdle Hop	4	\$N/A .. \$N/A	4	Height
Pair w/NO REST				
SQ Jump Weighted	4	\$N/A .. \$N/A	4	0:1:0:0:0:0
Pair w/NO REST				
Acc Band Jump Pause	4		4	0:1:0:0:0:0

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Potential Clusters

- Simple Contrast Model for high school - Acceleration
- [Sport Back Squat](#) - 1 rep 65-80% + Box Jump / 1 rep...15-20 seconds Rest
- Sport Back Squat - 1 rep 65-80% + Box Jump / 1 rep...15-20 seconds Rest
- Sport Back Squat - 1 rep 65-80% + Box Jump / 1 rep...15-20 seconds Rest
- Sport Back Squat - 1 rep 65-80% + Box Jump / 1 rep
- Rest 2-3 minutes, then repeat for a total of 2 to 4 sets

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Potential Clusters

- Top end Speed Running
- Hex Dead lift - 1 rep 65-80% + Hurdle Hop / 1 rep...15-20 seconds Rest
- Hex Dead lift - 1 rep 65-80% + Hurdle Hop / 1 rep...15-20 seconds Rest
- Hex Dead lift - 1 rep 65-80% + Hurdle Hop / 1 rep...15-20 seconds Rest
- Hex Dead lift - 1 rep 65-80% + Hurdle Hop / 1 rep
- Rest 2-3 minutes, then repeat for a total of 2 to 4 sets

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Potential Clusters

- Peaking Focus for Team Sports, Basic Approach
- 25-30% Load Squat jump 1 rep + Drop box Jump / 1 rep...15-20 seconds Rest
- 25-30% Load Squat jump 1 rep + Drop box Jump /1 rep...15-20 seconds Rest
- 25-30% Load Squat jump 1 rep + Drop box Jump / 1 rep...15-20 seconds Rest
- 25-30% Load Squat jump 1 rep +Drop box Jump / 1 rep
- Rest 2-3 minutes, then repeat for a total of 1 to 3 sets

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Potential Clusters

- Peaking Focus for Team Sports, Advanced Athletes
- 25-30% Load Squat jump/1 rep + Drop box Jump/1 rep + Acc. Band Jump/1 rep...15-20 seconds Rest
- 25-30% Load Squat jump/1 rep + Drop box Jump/1 rep + Acc. Band Jump/1 rep...15-20 seconds Rest
- 25-30% Load Squat jump/1 rep + Drop box Jump/1 rep + Accelerated Band Jump/1 rep
- Rest 2-3 minutes, then repeat for a total of 2 to 4 sets

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Theories based on Advance Biochemical Programming

- Intensity and Duration should be the focal point of the program for that day.
- Specificity of exercise program is critical to adaptation

Maxim Sokolov Moscow 2003 - VN Seluyanov – 1996 - Vladimir Platonov – Issurin - Yessis in Conversation

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Theories based on Advance Biochemical Programming

- Train in a method so all Systems, Organs, Plastic Structures of the metabolism, Grouping of Cells and Cells Adapt to same Stress- Results are going to be deep adaptations with less negative stress response because of less stress on the functional reserves of adaption energy.
- Pull the organism in multiple directions is not optimal for the highest result. Ex-Triathlon and Powerlifting

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Biochemical Programming/High Speed

- Training at high-speed, intensive loads is accompanied by the largest changes in the nervous system apparatus of muscle – CNS, myelination – sarcoplasmic reticulum (site of calcium release, facilitates muscular contraction, and the myoglobin and creatine phosphate contents – **How?**

High Speed Methods

Biochemical parameters of fitness of the organism - Russian

- **Work is Key to All Adaptions for Sport.**
- Dynamic System Theory

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Theories Based on Advance Biochemical Programming

- **Biochemical Control of your programming through** - Intensity and Duration should be the focal point of the program for that day
- Your use of Block Methods or Conjugate you can controlled by the Biochemical aspects of training.

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Theories Based on Advance Biochemical Programming

- Since biochemical adaptive changes do not develop simultaneously, blocks of oxidative, lactic, and alactic work is needed. This can be done in the offseason - Protasenko B - N.N Yakovlev -

“Preparation that entails the use of both types of training concurrently demand energy needs that surpass the limits of homeostatic regulation. Correspondingly, stress reactions become stronger. This more strained metabolic and hormonal body environment suppresses homeostatic responses and has a deleterious effect on workloads intended to develop basic athletic abilities. Such conflicting responses, which are typical of mixed training among high-performance athletes, lead to a decline in general aerobic abilities, a reduction in muscle strength, and cases of overtraining.”

- VLADIMIR ISSURIN

Key Reason For Biochemical

- Regular physical exercise leads to the expression and multidirectional biochemical and morphological changes in the human organism. All of these changes are specific, and they are closely related to the nature, intensity and duration of exercise.
- The specificity of the adaptive changes in the body, developing under the influence of training is clearly evident in terms of both immediate and cumulative training effect, and can be traced at all levels - from the molecular to the organismic

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New Tissue Consideration

- You should never lose sight of the ultimate goal, to add new tissue. This requires balancing the hyperplastic effect of the training against the strong tendency of the body toward catabolism. Cortisol is the body's biochemical agent for catabolism. Training, particularly heavy training, raises Cortisol levels. When Cortisol levels rise, new tissue is favored over old tissue. This raises the potential for a net loss of muscle tissue. This is clearly counterproductive. Wesley James
- Triphasic tissue remodeling – the consideration to keep cortisol down should play a role in programming
- Triphasic first to blocks with eccentric and isometric with maximal tissue adaption with 20 and 25 second sets.
- After those sets possible sets rest periods are extended and sets are reduced to under 10 seconds. Cluster Training concept. Or all blocks 10s

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Biochemical Adaption Considerations

- Gleeson 2005 –
- Group 1 –
- Aerobic training with carb's provide greater performance results in 3 weeks
- Group 2 –
- Aerobic training low carb's provide greater adaption results in 3 weeks.

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Benefits Of Time Training

- Increased Density Per Set
- Competitiveness/Competition of athletes
- [AFSM – Dynamic Correspondence](#)
- Relaxing – Enzyme Control -
- Regulation of Specificity of sport in Regard to duration and energy systems
- Regulation of the Biochemistry of Training

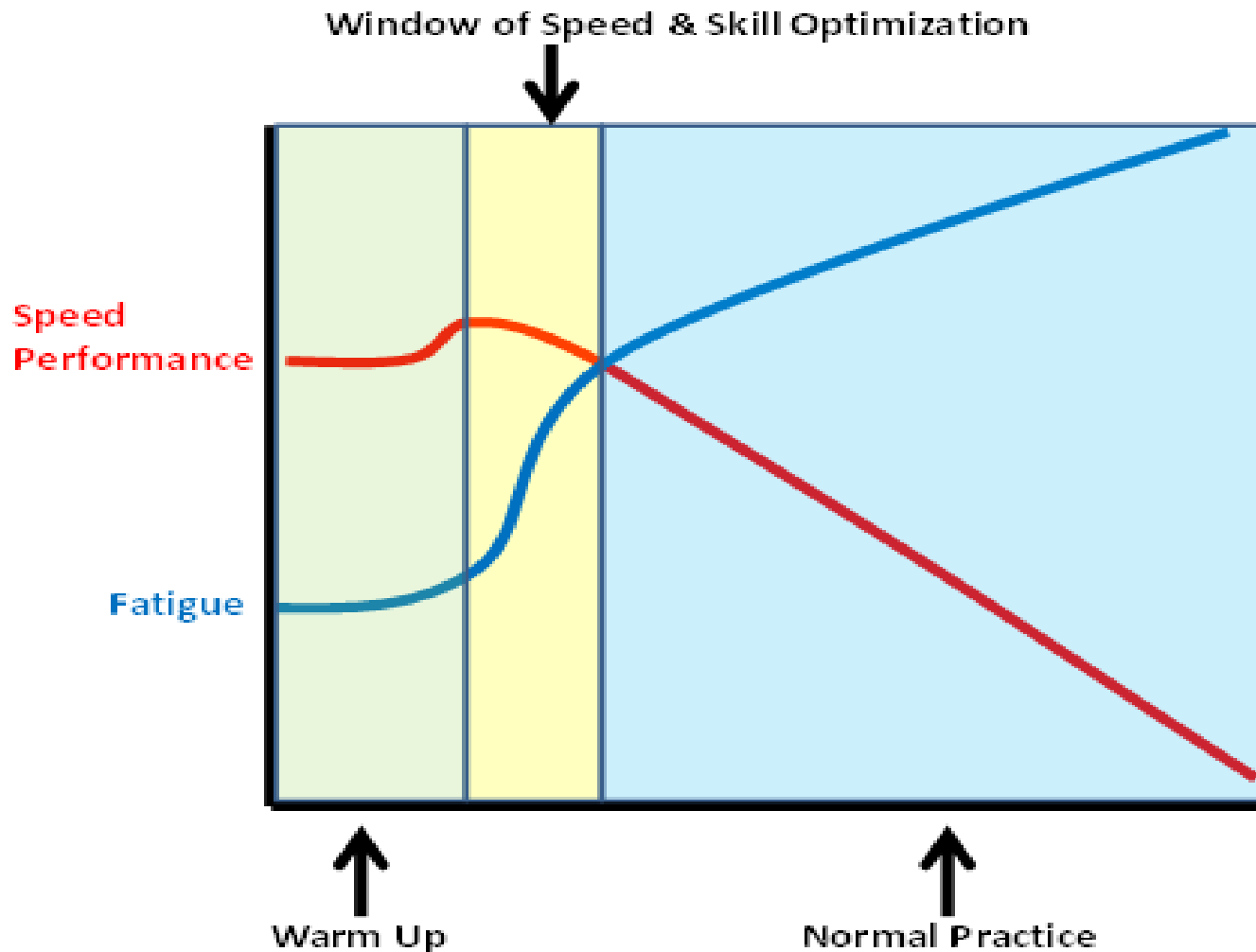
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Speed and Skill Optimization

A Proposal for a New Practice Paradigm



Speed and Skill Optimization

A Proposal for a New Practice Paradigm

Table 1. *Guidelines for Duration, Rest Intervals, and Repetitions*

Duration of the Drill	Rest Period	Repetition Guidelines
3 seconds	50 to 75 seconds	8 -12
5 seconds	75 to 90 seconds	6 - 8
7 or 8 seconds	90 to 120 seconds	4 - 6

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Enzyme Considerations

- mTORC1
- AMPK

Genetic Marker – for Mitochondria Density

- PPARDelta
- PRC
- PGC-1alpha

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