

# Comprehensive Program Design and Progression for Strength

*Part 2: Progression Strategies and Autoregulation*

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MASS Issue 6, September 2017

## Everything To Cover

**Today:  
Part 2**

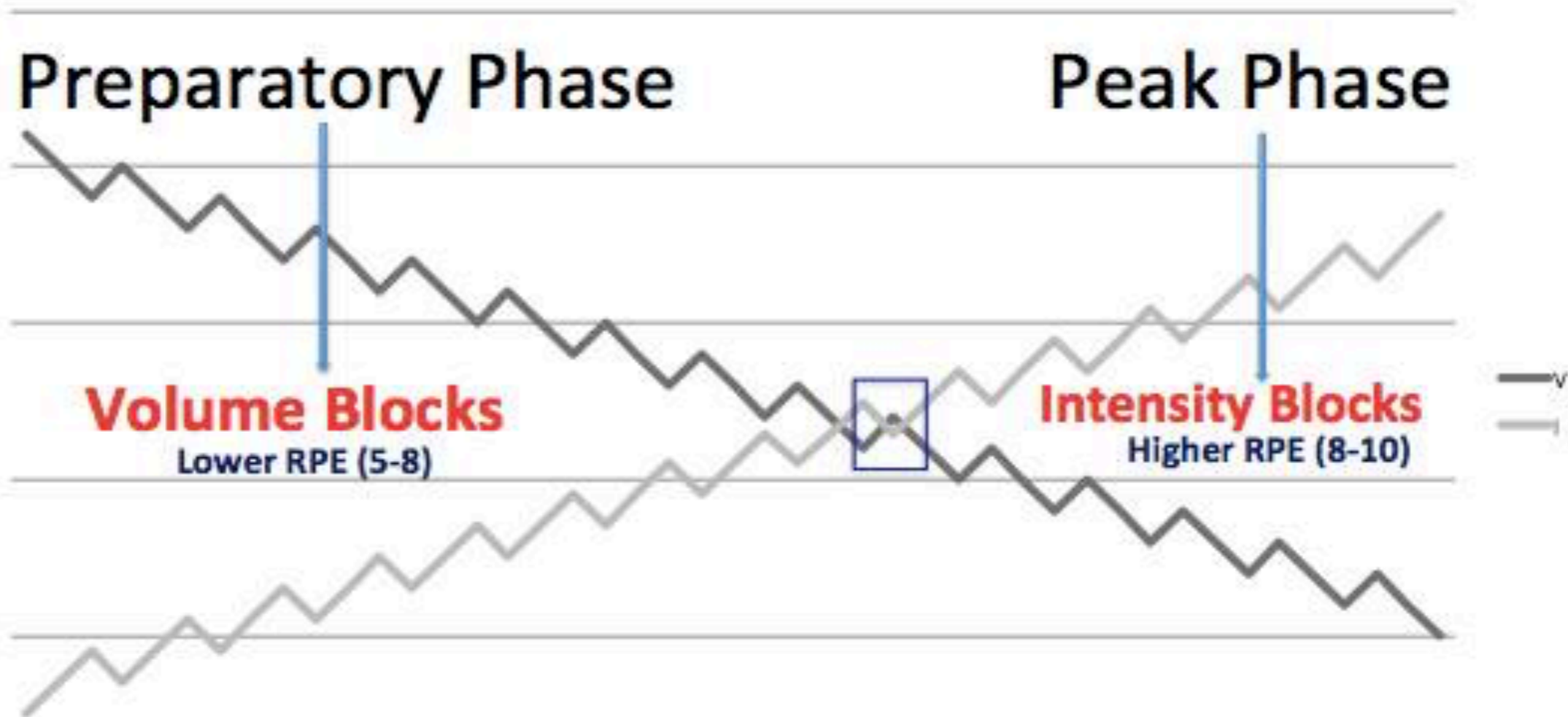


- *1. Definition of Terms and Overall Research Results*
- *2. Understanding Research Limitations*
  - *3. Integrate "Types"*
  - *4. Intros and Tapers*
- *5. Programming vs. Periodization*
  - *6. Weekly Volume Allocation*
  - *7. Load Progression*
- *8. Autoregulation and Velocity-Based Strategies*
  - *9. Volume and Intensity Block Design*
  - *10. Individualizing Repetitions Performed*
- *11. Programming Strategies and Alterations to the Typical Macrocycle*
  - *12. Bodybuilding Examples*
  - *13. True peaking examples*
    - *14. Overreaching*
  - *15. Volume with Low Reps?*

## Today's Objectives

- 1. Review Integration of Concepts
- 2. Examine Various Types of Load Progression
- 3. Understand how to individualize repetition prescription
- 4. Allocating Weekly Volume Appropriately

### Integrated Periodization Macrocycle



-Daily Undulating Programming Strategy is used within each week

-Yet, this fits into Yearly Linear/Block Periodization Design

**Stress per set increases as intensity increases**

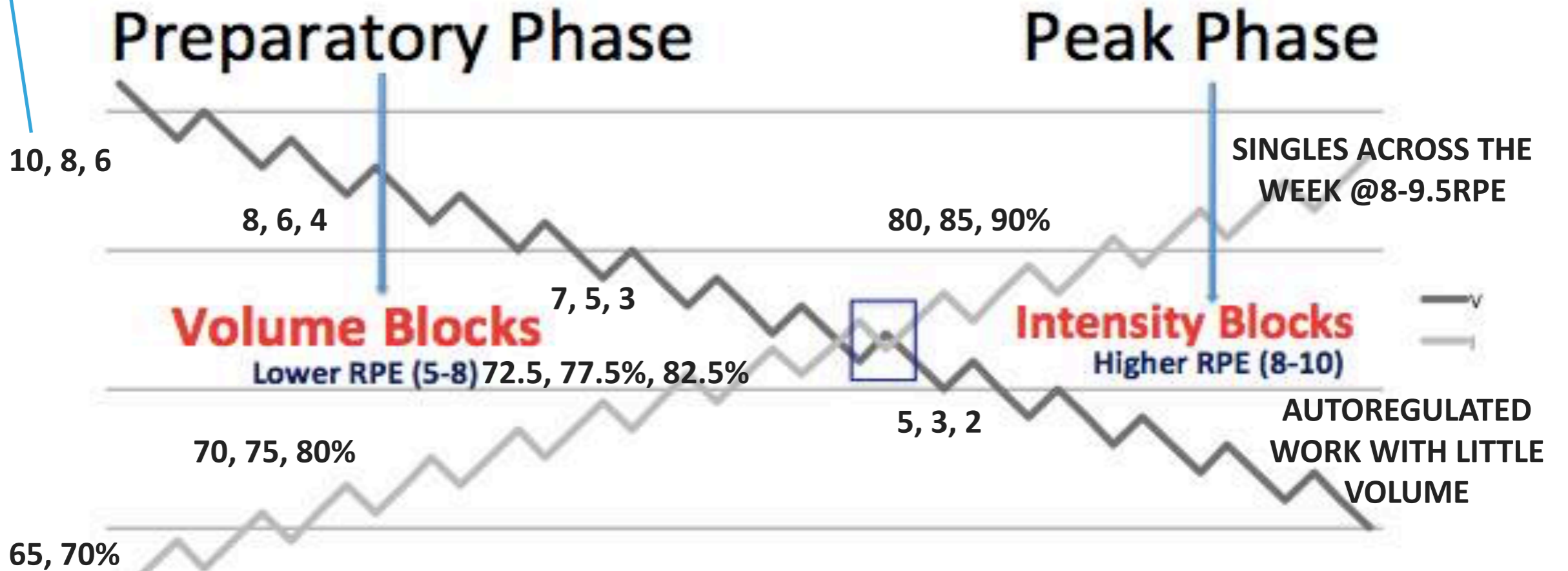
**High Volume = Lower RPE Per Set**

**High Intensity = Greater RPE Per Set**

## New Foundations:

### Integrated Periodization Macrocycle

Repetitions  
Across the  
Week



-Daily Undulating Programming Strategy is used within each week

-Yet, this fits into Yearly Linear/Block Periodization Design

**Stress per set increases as intensity increases**

**High Volume = Lower RPE Per Set**

**High Intensity = Greater RPE Per Set**

Intensities  
Across the  
Week

## *Prep Phase – Volume Block: Mesocycle GOAL = 5-8RPE*

Week 1	Day I	Day II	Day III
Squat	4X8 @70%	5X6 @75%	6X4+ @80%
Week 2	Day I	Day II	Day III
Squat	4X8 @W1+5kg	5X6 @W1+5kg	6X4+ @W1+5kg
Week 3	Day I	Day II	Day III
Squat	4X7 @W2+2.5kg	5X5 @W2+2.5kg	6X3+ @W2+2.5kg
Week 4	Day I	Day II	Day III
Squat	4X7 @W3+2.5kg	5X5 @W3+2.5kg	6X3+ @W3+2.5kg

## Variants of Weekly Progression

**There are plus and minuses to ALL of these**

- ▶ 1. Adding and arbitrary amount of weight
- ▶ 2. Based upon 'plus set' numbers
  - ▶ APRE (Autoregulatory Progressive Resistance Exercise) *Mann et al. 2010*
  - ▶ This may be best as a percentage of 1RM increase rather than fixed values
    - ▶ i.e. +5% of 1RM rather than +5kg.
- ▶ 3. AR (Autoregulation), based upon RPE values
  - ▶ **You Will not progress every week forever, so...**

## APRE Progression Example

Plus Set Repetitions Performed	Next Week's Load Increase
9-10	+7.5 kg
7-8	+5 kg
5-6	+2.5 kg



Plus Set Repetitions Performed	Next Week's Load Increase
9-10	+3.5 % of 1RM
7-8	+2% of 1RM
5-6	+1% of 1RM

## RPE Progression Example

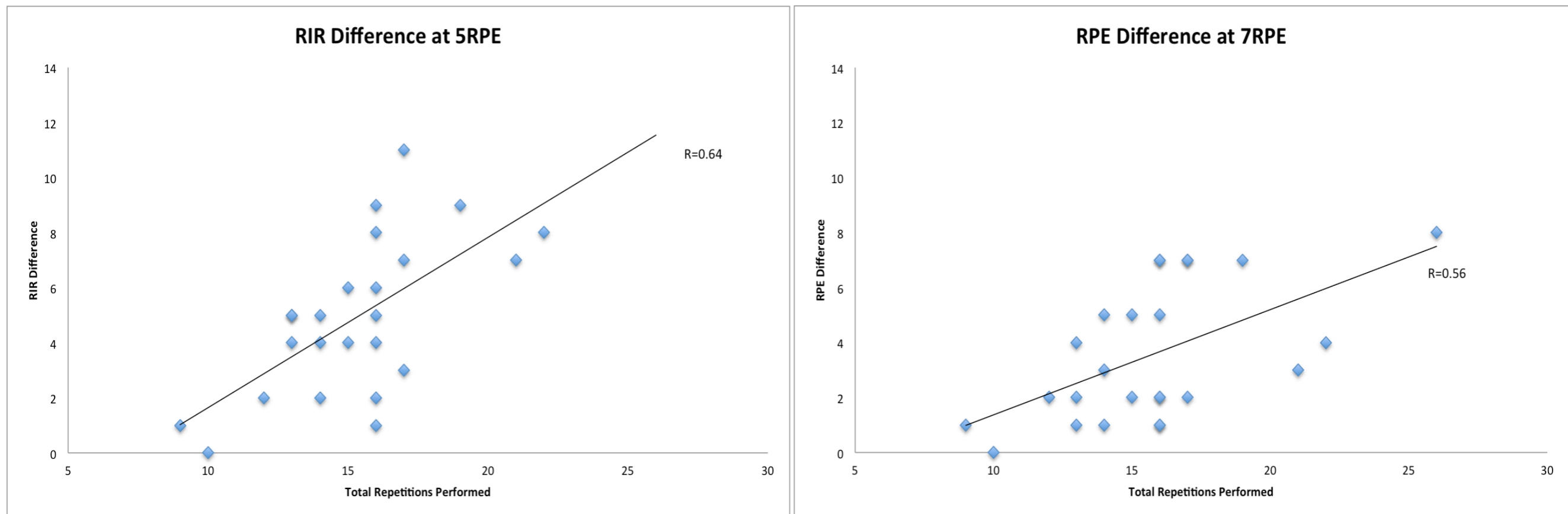
**RPE Goal=5-7, So progress in relation to a 6 RPE**

Average RPE	Next Week's Load Increase
5	+7.5 kg/3.5%
6	+5 kg/2%
7	+2.5 kg/1%
8	No Change



EXERCISE (WEEK)	MONDAY	WEDNESDAY	FRIDAY
SQUAT (WEEK 1)	3 X 8 w/100kg @5 RPE	4X6 w/110kg @7RPE	5X4 w/120kg @8RPE
SQUAT (WEEK 2)	3 X 8 w/107.5kg	4X6 w/112.5kg	5X4 w/120kg

## RPE becomes more accurate the closer to failure and less RIR



*When subjects called a '9' RPE almost everyone was right on or within 1 rep*

## If using, % how to decide what intensity for specific repetitions?

- ▶ This is the drawback of %1RM
- ▶ Have RPE goals in addition to %1RM
- ▶ Individualized based upon previous training experience, status, and specificity
- ▶ Can use RPE, but also drawbacks of using solely RPE
  - ▶ Can verify with velocity, but velocity is individual to a certain extent

## Repetitions Allowed at a Given Percentage can Be *Somewhat* Based on *this Chart*

Table 1 - Relationship with Percentage 1RM, Repetitions Performed and RIR-based RPE								
RPE	Repetitions Performed							
	1	2	3	4	5	6	7	8
10	<b>100%*</b>	95.0%	91.0%	87.0%	85.0%	83.0%	81.0%	79.0%
9.5	97.0%	93.0%	89.0%	86.0%	84.0%	83.0%	80.0%	77.5%
9	95.0%	91.0%	87.0%	85.0%	83.0%	81.0%	79.0%	76.0%
8.5	93.0%	89.0%	86.0%	84.0%	83.0%	80.0%	77.5%	74.5%
8	<b>91%*</b>	87.0%	85.0%	83.0%	81.0%	79.0%	76.0%	73.0%
7.5	89.0%	86.0%	84.0%	82.0%	80.0%	77.5%	74.5%	71.5%
7	87.0%	85.0%	83.0%	81.0%	79.0%	76.0%	73.0%	<b>70%*</b>

\*Mean values from sets in Zourdos et al. (39)

**Although more recent data from our lab suggests 15 repetitions on average at 70%, but with a huge range**

Helms, Storey, Cronin, Zourdos 2016

*Reps performed is individual, but what factors influence it?*

## Femur Length and Body Composition May Impact Repetitions Performed

Fatigue Set		Height (cm)			Body Mass (kg)			Femur:Height			Body Fat (%)			Femur Length (cm)		
		M	F	All	M	F	All	M	F	All	M	F	All	M	F	All
<i>Total Reps</i>	Correlation r	-0.58	-0.06	-0.39	-0.61	0.17	-0.37	0.01	0.22	0.07	-0.44	-0.08	-0.33	-0.43	0.03	-0.31
	P Value	<b>&lt;0.001</b>	0.84	<b>0.003</b>	<b>&lt;0.001</b>	0.54	<b>0.004</b>	0.95	0.43	0.61	<b>0.002</b>	0.77	<b>0.013</b>	<b>0.004</b>	0.93	<b>0.018</b>
<i>Velocity Loss</i>	Correlation r	0.04	-0.01	0.08	0.07	-0.24	0.08	-0.11	-0.16	-0.16	-0.09	-0.42	-0.19	-0.03	-0.07	-0.02
	P Value	0.80	0.98	0.54	0.65	0.38	0.54	0.51	0.58	0.24	0.56	0.12	0.15	0.87	0.81	0.88

M: Male subjects, F: Female subjects, All: All subjects. Level of significance p<0.05.

\*N=57; data no useable

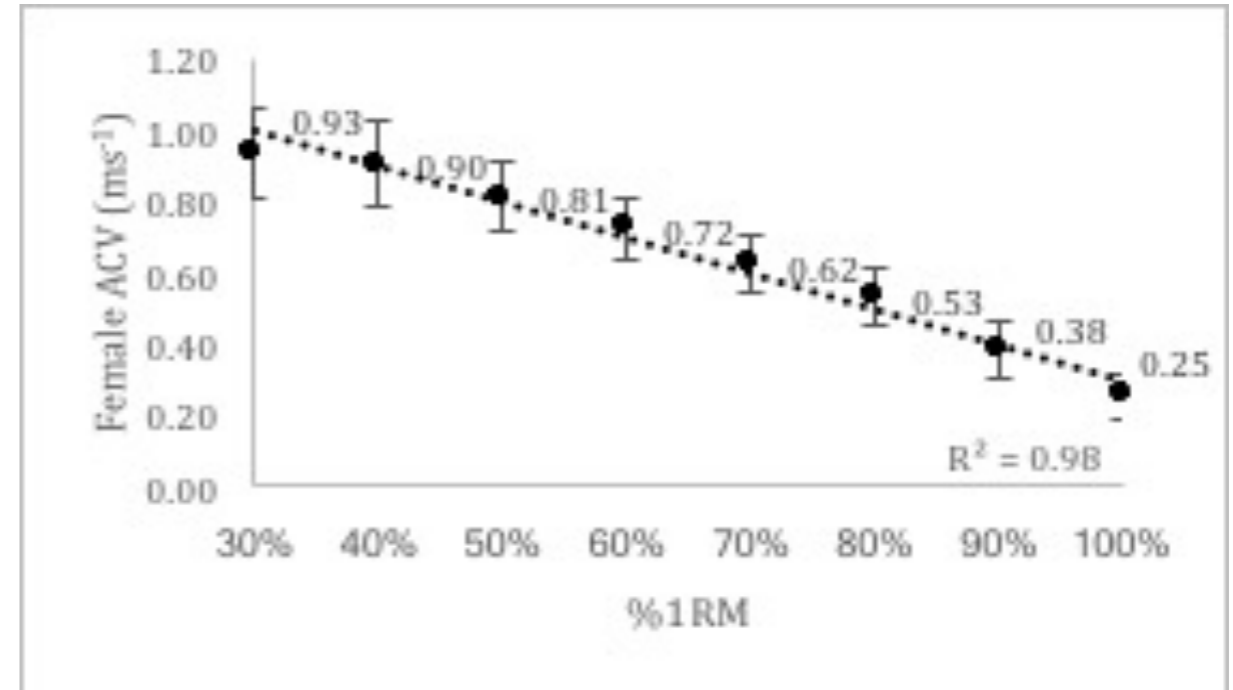
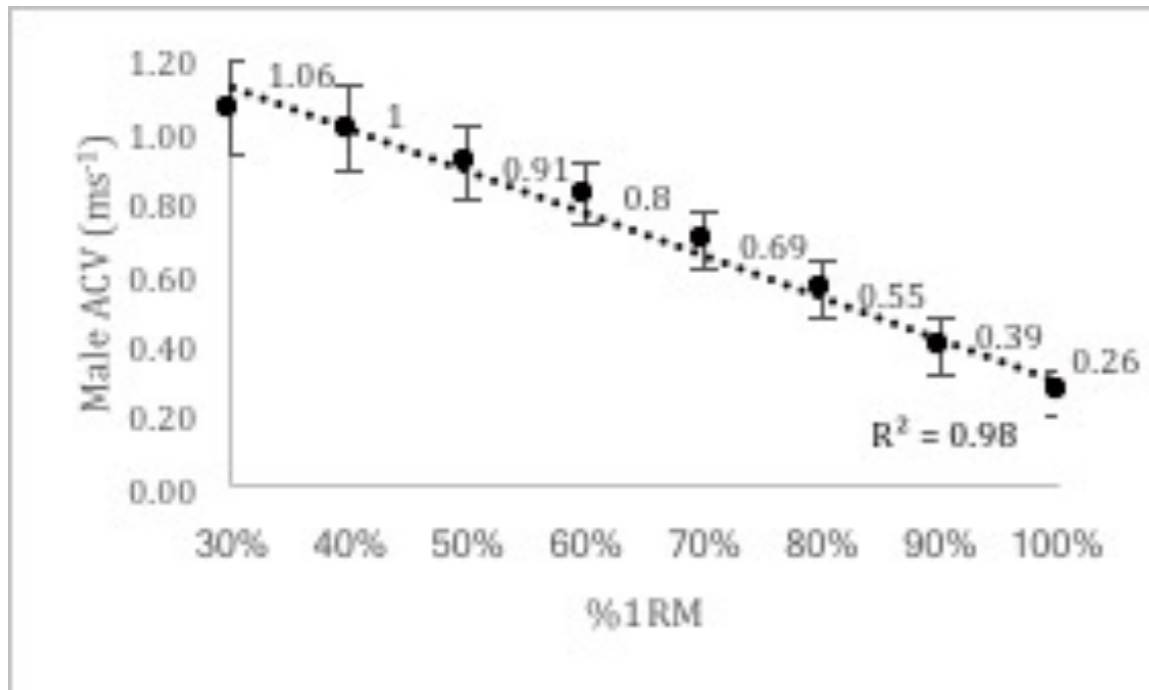
\*\*N=56; data not useable

### The Five Lowest and Highest Reps and Associated Femur Lengths

Lowest and highest 5 subjects repetitions performed	Femur Length (cm)	No. of reps performed (#)
Lowest	48.00	6
Lowest +1	49.80	8
Lowest +2	48.80	8
Lowest +3	50.20	9
Lowest + 4	48.30	9
Highest -4	38.20	21
Highest -3	44.15	21
Highest -2	41.10	23
Highest-1	45.40	24
Highest	39.50	28



## Normative Values for Velocity-Based Training



Load	Mvel (ms-1)	90CL	MRPE	Fvel (ms-1)	90CL	FRPE	AllVel (ms-1)	90CL	AllRPE
30%	1.06±.13	0.03	1.5±1	.93±.08	0	1.5±.5	1.03±.13	0.03	1.5±1
40%	1.00±.12	0.03	2±1	.9±.05	0.02	1.5±.5	.97±.11	0	2±1
50%	.91±.1	0.03	3±1.5	.81±.07	0.03	2.5±1	.88±.1	0	3±1.5
60%	.82±.09	0.02	4±1.5	.72±.05	0	3.5±1	.79±.09	0	4±1.5
70%	.69±.08	0.02	5±1.5	.62±.05	0.02	5±1	.67±.08	0	5±1.5
80%	.55±.08	0.02	6.5±1	.53±.04	0.02	6.5±1	.55±.07	0.02	6.5±1
90%	.39±.08	0.02	8.5±1	.38±.05	0.02	8.5±1	.39±.07	0.02	8.5±1
1RM	.26±.06	0.02	9.5±.5	.25±.05	0	9.5±.5	.26±.06	0.01	9.5±.5

## Prescribing Load with Velocity-Based Ranges

	Week 1	Week 2	Week 3	Week 4
Day 1	3x8@ .6-.8m·s <sup>-1</sup>	3x8@ .6-.8m·s <sup>-1</sup>	3x8@ .5-.7m·s <sup>-1</sup>	3x8@ .5-.7m·s <sup>-1</sup>
Day 2	3x6@ .5-.7m·s <sup>-1</sup>	3x6@ .5-.7m·s <sup>-1</sup>	3x6@ .4-.6m·s <sup>-1</sup>	3x6@ .4-.6m·s <sup>-1</sup>
Day 3	3x4@ .4-.6m·s <sup>-1</sup>	3x4@ .4-.6m·s <sup>-1</sup>	3x4@ .3-.5m·s <sup>-1</sup>	3x4@ .3-.5m·s <sup>-1</sup>

## Prep Phase – Volume Block: \*GOAL = 5-8RPE\*

Week 1	Day I	Day II	Day III
Squat	4X8 @5-7RPE	5X6 @5-7RPE	5X4+ @5-7RPE

Week 2	Day I	Day II	Day III
Squat	4X8 @5-7RPE	5X6 @5-7RPE	5X4+ @5-7RPE

Week 3	Day I	Day II	Day III
Squat	4X7 @6-8RPE	5X5 @6-8RPE	5X4+ @6-8RPE

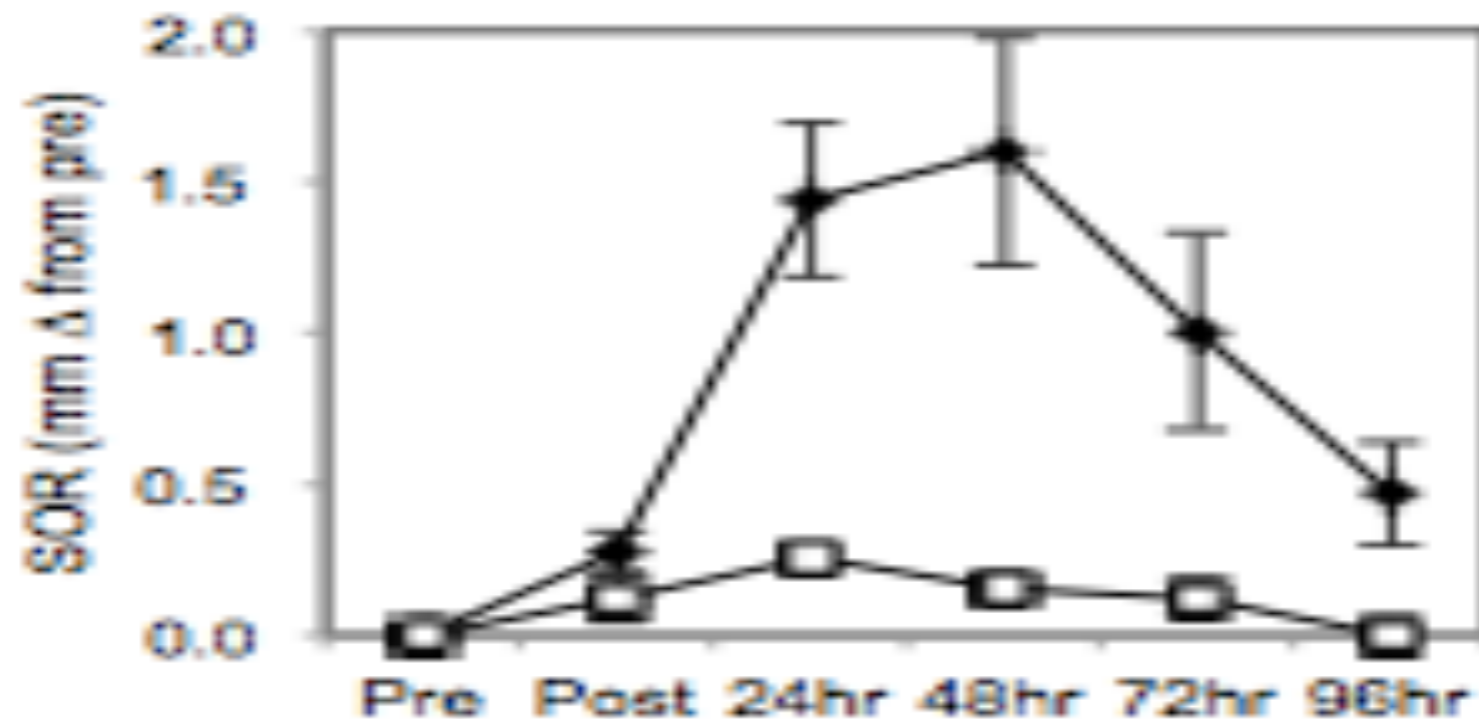
Week 4	Day I	Day II	Day III
Squat	4X7 @6-8RPE	5X5 @6-8RPE	5X4+ @6-8RPE

## INTRODUCTORY MICROCYCLE

Taper	Day I	Day II	Day III
Squat	3X8 @65%	4X6 @70%	5X4 @75%

RBE  
**Repeated  
 Bout  
 Effect**  
*The  
 Protection  
 Against  
 Damage*

***RPE Goal for Volume Intro =  
 About 5, maybe even less***



## After Volume Block: Taper and Intro for Intensity Block

### TAPER WEEK and TEST

Taper	Day I	Day II	Day III
Squat	3X3 @70%	3X1 @80%	2RM TEST

### INTRODUCTORY MICROCYCLE

Taper	Day I	Day II	Day III
Squat	3X6 @70%	4X4 @75%	2X2 @80%

## Peak Phase – Intensity Block

\*Goal: 7-10RPE\*

Week 1	Day I	Day II	Day III
Squat	3X5 @80%	4X3 @85%	4X2+ @90% ( <i>Capped</i> )
Week 2	Day I	Day II	Day III
Squat	Single @8RPE, 2X5 @7-9RPE	Single @8RPE, 3X3 @7-9RPE	X2 @9RPE, 3X2 @85% of double
Week 3	Day I	Day II	Day III
Squat	Single @8-9RPE 2X5 @7-9RPE	Single @8 3X3 @7-9RPE	X1 @9RPE, 2X2 @87.5% of double
Week 4	Day I	Day II	Day III
Squat	Single @8.5-9RPE 2X4 @8-9.5RPE	Single @8 3X2 @8-9.5RPE	X1 @9.5RPE, 2X1 @90% of single

## Conceptually Moving Throughout a Macrocycle

- ▶ **Intro Cycle (1-2 Weeks)**
- ▶ **Main Mesocycle (4-8 Weeks)**
- ▶ **Taper (1 Week)**
- ▶ **Intro (1-2 Weeks)**
- ▶ **Main Mesocycle (4-8 Weeks)**
- ▶ **Taper (1 Week)**

# Macrocycle?...It's not that hard

Wks. 1-4	Day I	Day II	Day III
Squat	4X8 @70%	5X6 @75%	6X4+ @80%
Wks. 7-10	Day I	Day II	Day III
Squat	4X7 @72.5%	5X5 @77.5%	6X3+ @82.5%
Wks. 13-16	Day I	Day II	Day III
Squat	4X6 @75%	5X4 @80%	6X2+ @85%

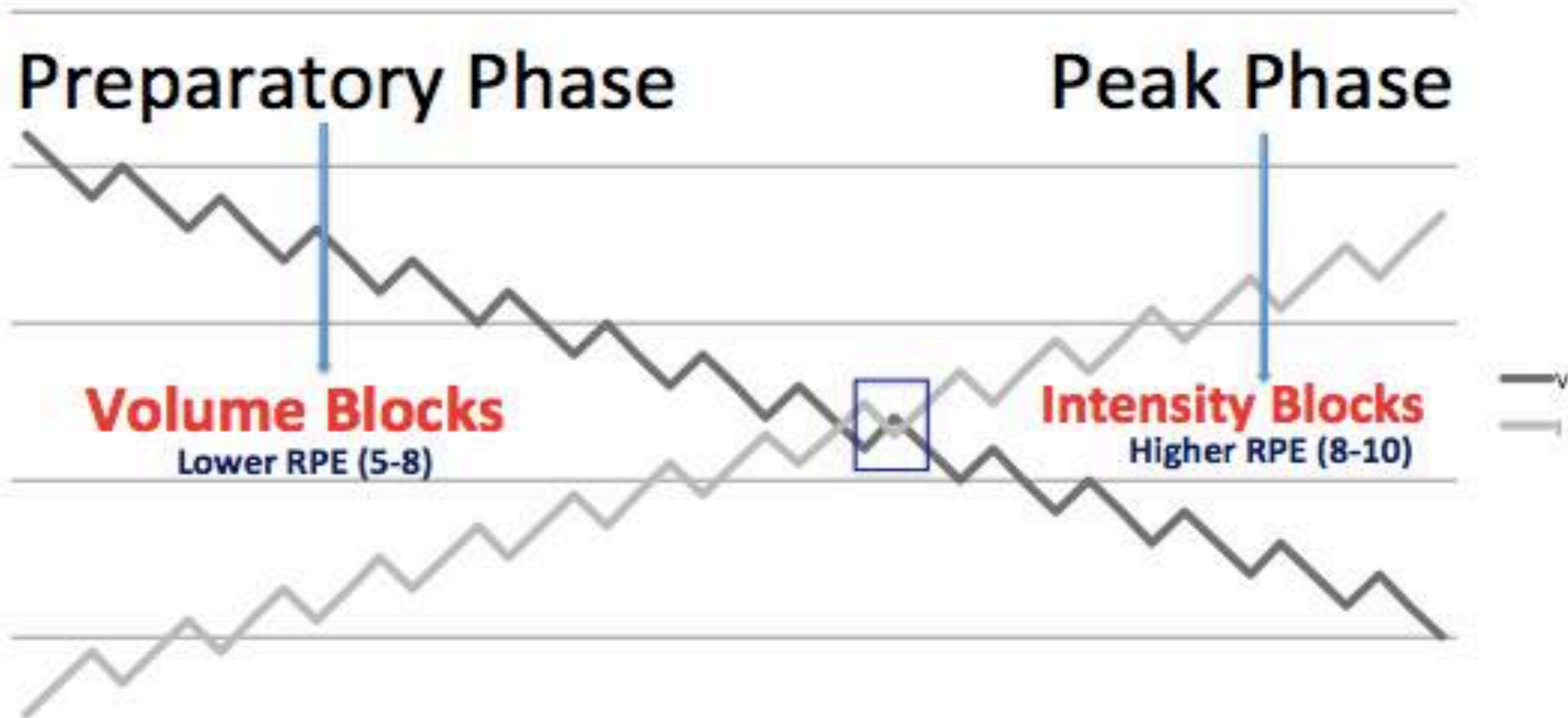
**THIS IS JUST CONCEPTUALIZING AND INTEGRATING THE DISCUSSED PRINCIPLES**

## Maybe even 'overreach' in the middle before peaking

Wks. 1-4	Day I	Day II	Day III	
Squat	4X8 @70%	5X6 @75%	6X4+ @80%	
Wks. 7-10	Day I	Day II	Day III	
Squat	4X7 @72.5%	5X5 @77.5%	6X3+ @82.5%	
Wks. 13-16	Day I	Day II	Day III	
Squat	4X6 @75%	5X4 @80%	6X2+ @85%	
Wks. 19-21	Day I	Day II	Day III	Day IV
Squat	5X6 @75%	6X4 @80%	7X3 @85%	10X2 @87.5%

**THIS IS JUST CONCEPTUALIZING AND INTEGRATING THE DISCUSSED PRINCIPLES**

### Integrated Periodization Macrocycle



-Daily Undulating Programming Strategy is used within each week

-Yet, this fits into Yearly Linear/Block Periodization Design

**Stress per set increases as intensity increases**

**High Volume = Lower RPE Per Set**

**High Intensity = Greater RPE Per Set**

## Progressing Volume Overtime

- ▶ The overarching concept is to progress appropriately, DO NOT progress too quickly
- ▶ If you are doing 8,000kg. maybe you then go to 10,000kg, and then to 12,000kg.
  - ▶ Over the course of various mesocycles
  - ▶ Understand absolute vs. relative volume
- ▶ You cannot start to light
- ▶ Almost always take 5kg. (at least) off of your max to start a program

## 2X/Wk. Frequency

Cycle 1	Monday	Thursday	Monday
Squat	10 (reps)	8	6
Cycle 2	Thursday	Monday	Thursday
Squat	10 (reps)	8	6
Cycle 3	Monday	Thursday	Monday
Squat	10 (reps)	8	6

**Frequency should depend upon training age, what the individual can handle, and what the individual can adhere to mentally and with their schedule**

## Applications and Takeaways

- ▶ **Integration of strategies**
- ▶ **Allocate weekly volume appropriately**
- ▶ **There are various ways to progress and all have both positives and negatives**
- ▶ **Anthropometrics and be taken into account for load assignment, which can aid in individualizing volume and intensity prescription**
- ▶ **Macrocycle structure incorporates an intro, main block, and taper/deload**

### NEXT TIME

**Further look through a macrocycle**  
**“Real World” Volume and Intensity Examples**  
**Overreaching**  
**Volume through low reps?**

**Specifics of the theory for Bodybuilding**

*Life Tip For September:*  
*Roy Jones Jr.*  
*Was Extraordinarily Talented*

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