Utilizing Mechanical Advantages in the Weight-room

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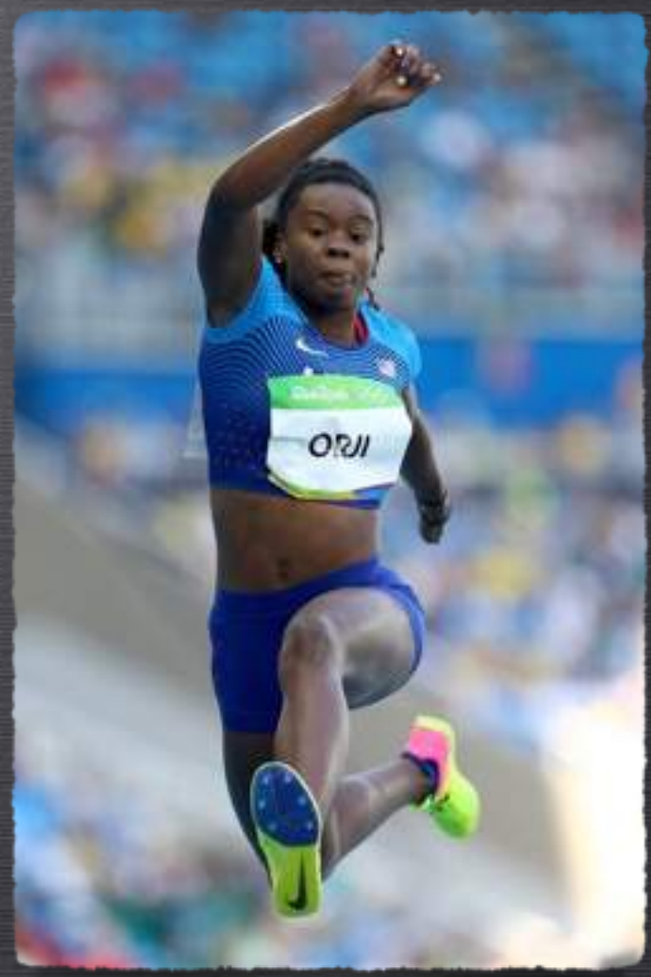
Understanding Sports Performance Strength Training

- Doing Simple Things Extraordinarily Well
- Write & Implement the weight-room Workouts
- Needs Analysis Protocol
- ALL ABOUT PERFORMANCE: paid to produce
- Daily max % IS NOT always the total Max %
- Let the Athletics Trainers work the 'Prehab' phase



FUNDAMENTAL CONCEPTS OF TRAINING THEORY

SPECIFIC ADAPTATIONS TOWARD IMPROVEMENT OF PERFORMANCE

- EXERCISE OVERLOAD
- SPECIFIC TRAINING PROTOCOL
- CONTROL VOLUME & INTENSITY
- INDIVIDUALIZED TRAINING PROGRAM

FUNDAMENTAL CONCEPTS OF TRAINING THEORY

THEORY OF SUPER-COMPENSATION:

> FOLLOWING THE RESTORATION PERIOD THE LEVEL OF THE BIOCHEMICAL SUBSTANCE (HORMONES) INCREASES ABOVE THE INITIAL LEVEL

EFFECTS OF TRAINING:

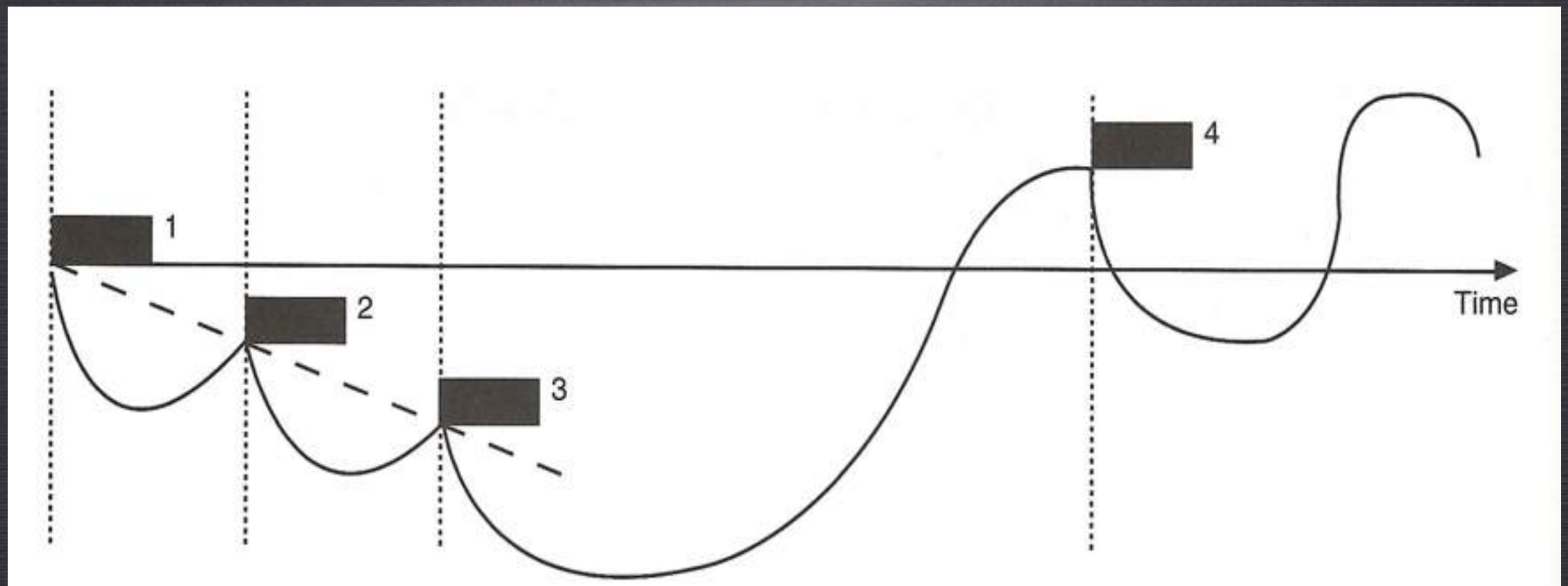
> ACUTE - IMMEDIATE

> DELAYED

> PARTIAL

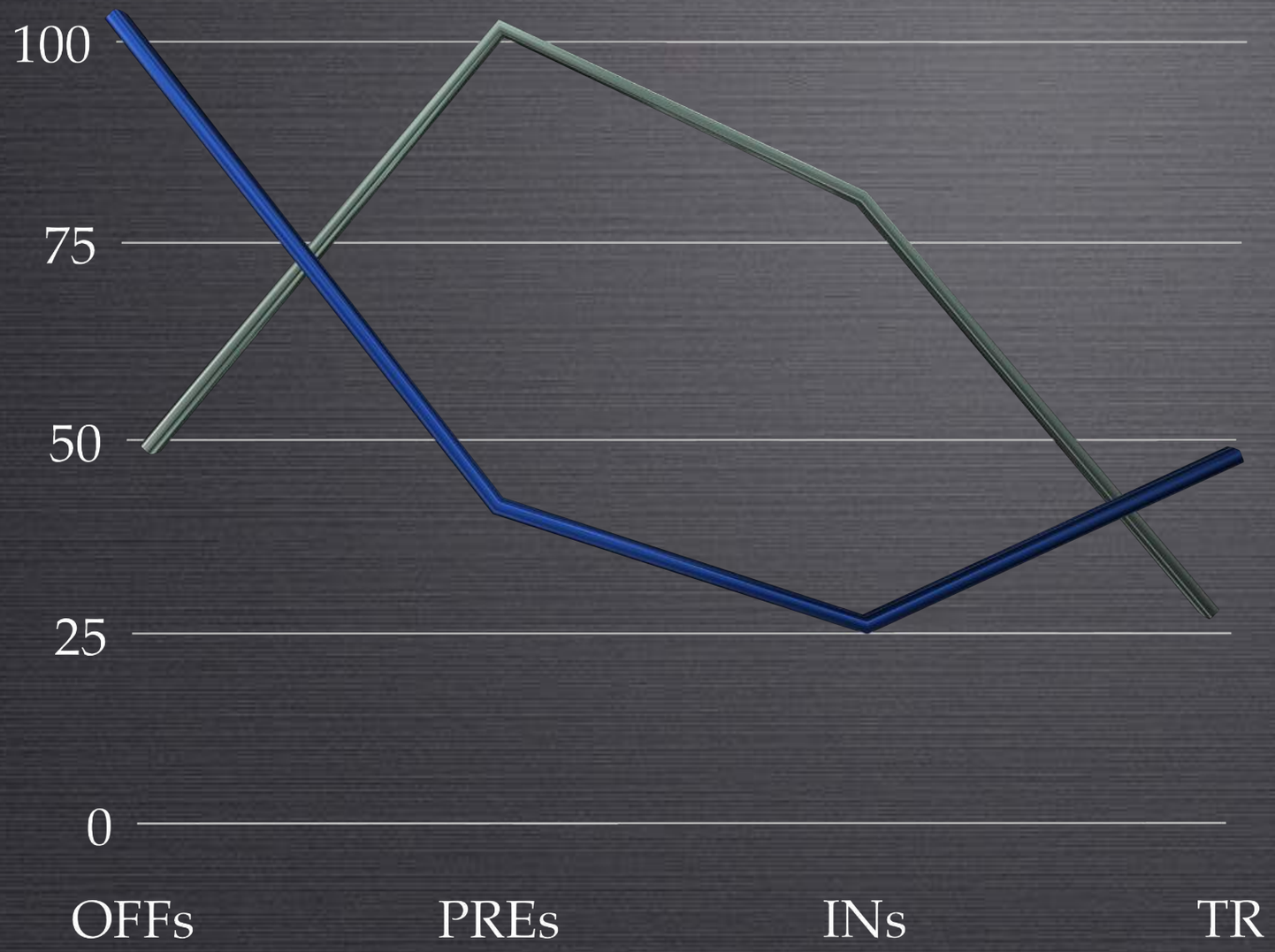
FUNDAMENTAL CONCEPTS OF TRAINING THEORY

OVERLOADING CYCLE OF THE SUPER-COMPENSATION THEORY



- ✓ 1-2-3 = WORKOUT SESSIONS OR MICROCYCLES
- ✓ FIRST 3 MODULES' REST IS TOO SHORT = FATIGUE
- ✓ 3-4 MODULE'S REST IS LONGER AND OPTIMAL FOR THE SITUATION
- ✓ NEXT CYCLE OR MODULE BEGINS AT A BETTER ATHLETE FITNESS LEVEL

VOLUME & INTENSITY



PERFORMANCE SPECIFIC STRENGTH

- STRENGTH EXERCISES MUST RESEMBLE THE TYPE OF RESISTANCE FOUND IN JUMPING EVENTS
  - DETRIMENTAL TO THE EFFICIENCY OF STRENGTH TRAINING

- EXPLOSIVE STRENGTH: ABILITY TO PRODUCE MAXIMAL FORCES IN MINIMAL TIME
  - STRONG PEOPLE DO NOT NECESSARILY POSSESS EXPLOSIVE STRENGTH

PERFORMANCE SPECIFIC STRENGTH

- HIGHEST FORCES ARE GENERATED DURING ECCENTRIC MUSCULAR ACTION
  - STRETCH-SHORTENING CYCLE (PLYOMETRIC TRAINING)
- IMPROVING FLEXIBILITY DURING STRENGTH DEVELOPMENT WILL RESULT IN GREAT MUSCULAR FORCE PRODUCTION

PERFORMANCE SPECIFIC STRENGTH

- Closed kinetic Chain exercises - Multi joint-muscle
- Single Leg-Arm Exercises
- Force production & optimal angles
- power output - Central Gear: HIPS (Greek:ισχίο= power)

Bridging Weight-Room and Track: Post-Activation Potentiation (PAP)

The principle behind PAP is that prior heavy loading, induces a high degree of central nervous system stimulation, resulting in greater motor unit recruitment and force, which can last from five-to-thirty minutes (Chiu, Fry, Weiss, et al., 2003)

BRIDGING THE WEIGHT-ROOM AND TRACK
Dr Chu's 25m hop testing

% Rank	Females (sec)	Males (sec)
Excellent	3.13 - 3.75	2.70 - 3.25
	3.76 - 4.50	3.36 - 3.90
Very Good	4.51 - 5.70	3.91 - 5.00
	5.71 - 6.90	5.01 - 6.10
Good	6.91 - 8.15	6.11 - 7.20
	8.16 - 8.90	7.21 - 7.90
Average	8.91 - 9.45	7.91 - 8.40
	9.46 - 10.05	8.41 - 8.95
poor	10.06 - 10.34	8.96 - 9.25
	10.35 - 10.70	9.26 - 9.60

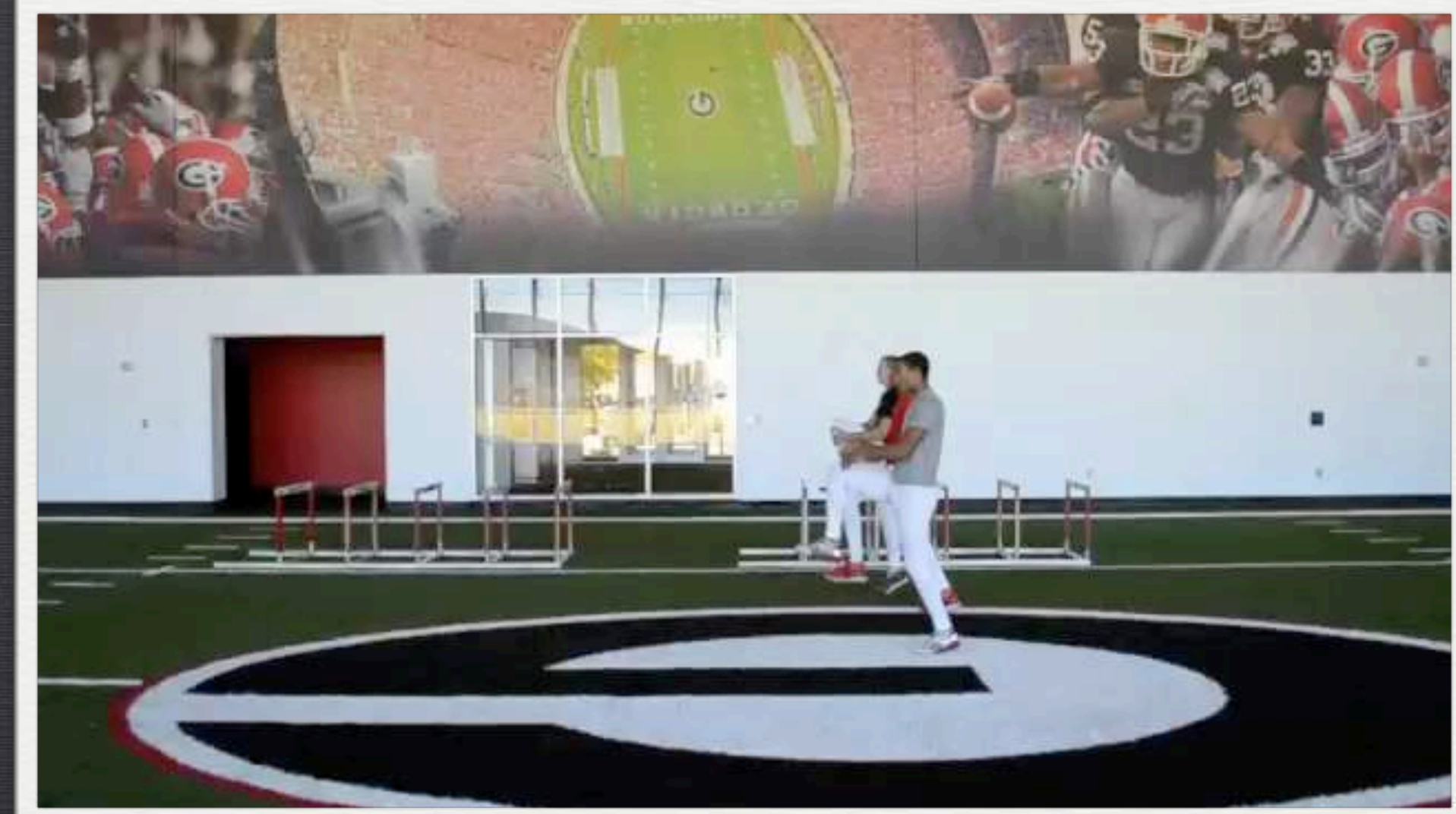
CHU, D.A. (1996) Explosive Power and Strength. Champaign: Human Kinetics

Effect of Event Duration & intensity on primary energy system used

Duration of the exercise	Intensity of the exercise	Primary Energy system(s)
0-6 seconds	extremely high	Phosphagen
6-30 seconds	very high	Phosphagen and fast glycolysis
30 sec - 2 min	High	fast glycolysis
2-3 minutes	Moderate	fast glycolysis and oxidative system
>3 min	Low	oxidative

TARGETING THE 'GEARS OF PERFORMANCE': HIPS AND CORE!

Sample Dynamic Warm Up Routine



Sample Platform Warm Up Routine

Clean Variations-Progressions (PPCS)

Clean Variations-Progressions (CSQP)

Block Snatch Samples

Power Clean Progressions (Hang)

Power Clean Progressions (Below Knee)

Power Clean Progressions (Floor)

Deadlift Snatch Grip Sample

Squat Variations (parallel)

Squat Variations (Half)

Squat Variations (1/4 Sq. EXPL)

Squat Variations (Front Sq Stops)

Tibia Flex-Heel Raise-1/4 SQ Jump

Command drills: toes raises to jump

Repeated Explosive Split Jerk

1-leg Squat variations (half)

1-leg Squat variations (1/4 jump)

1-Leg RDL Jump (floor)

1-leg Sited Jump

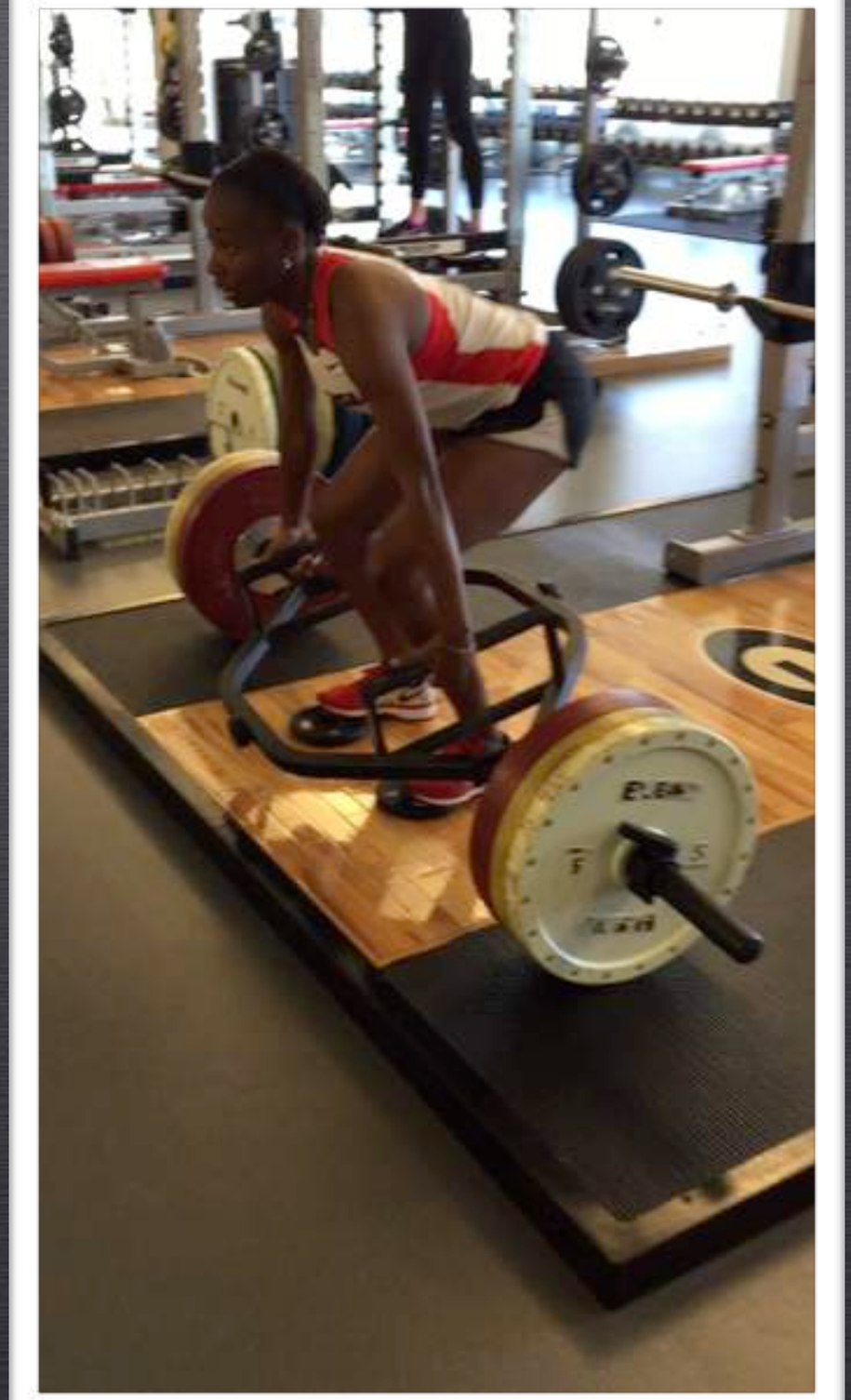
1-leg Sited Jump (Beh. Neck Press)

Heavy Step - Ups

Explosive Step - Ups

Hip-Hamstring Chain Stabilizers

Modified 'Trap Bar' Deadlift

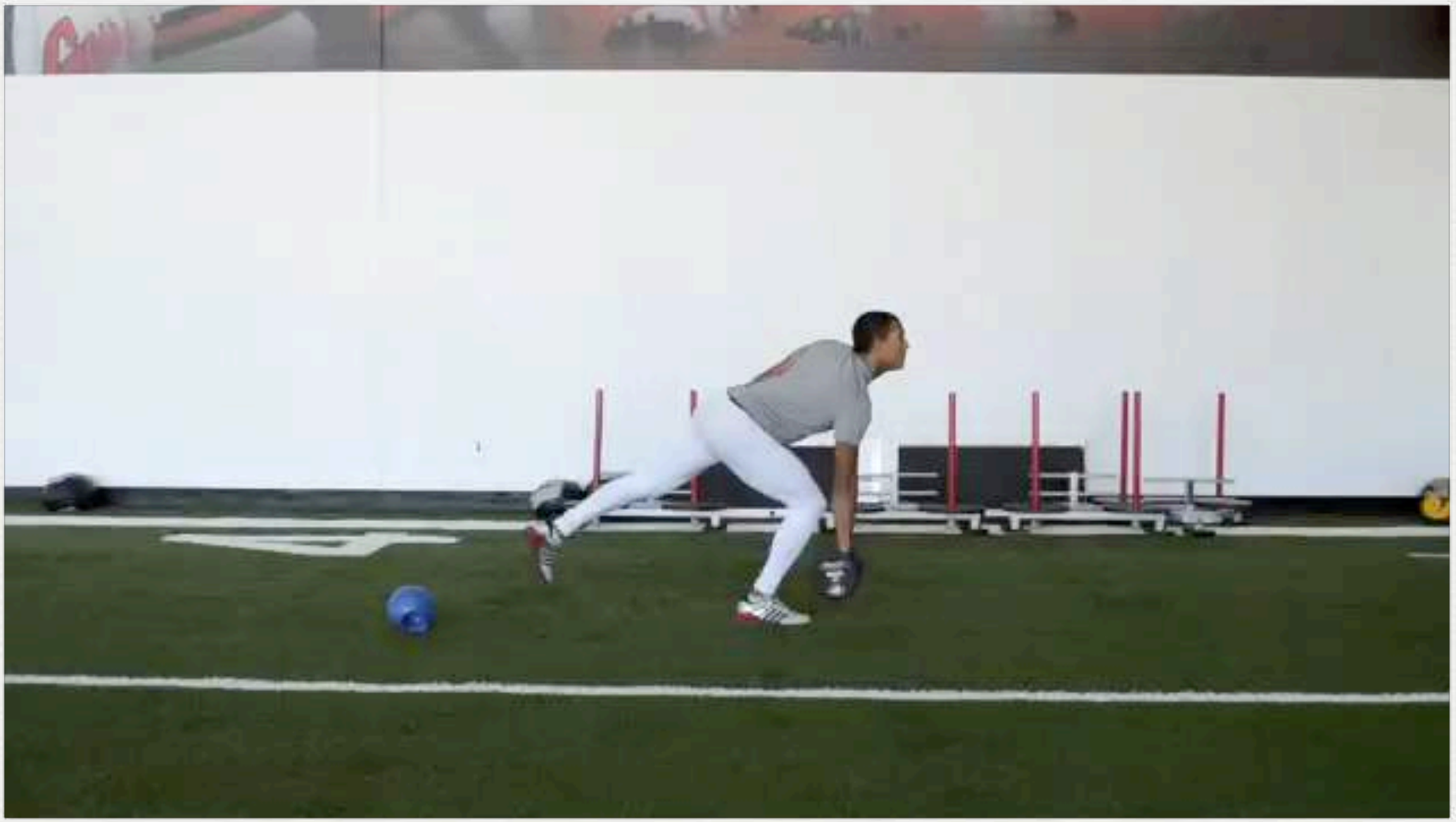


1-Leg RD to 1-Leg Clean

Tibia Flexes

Tibia Flexes

1-Leg/Arm DB Snatch



DB Push Press

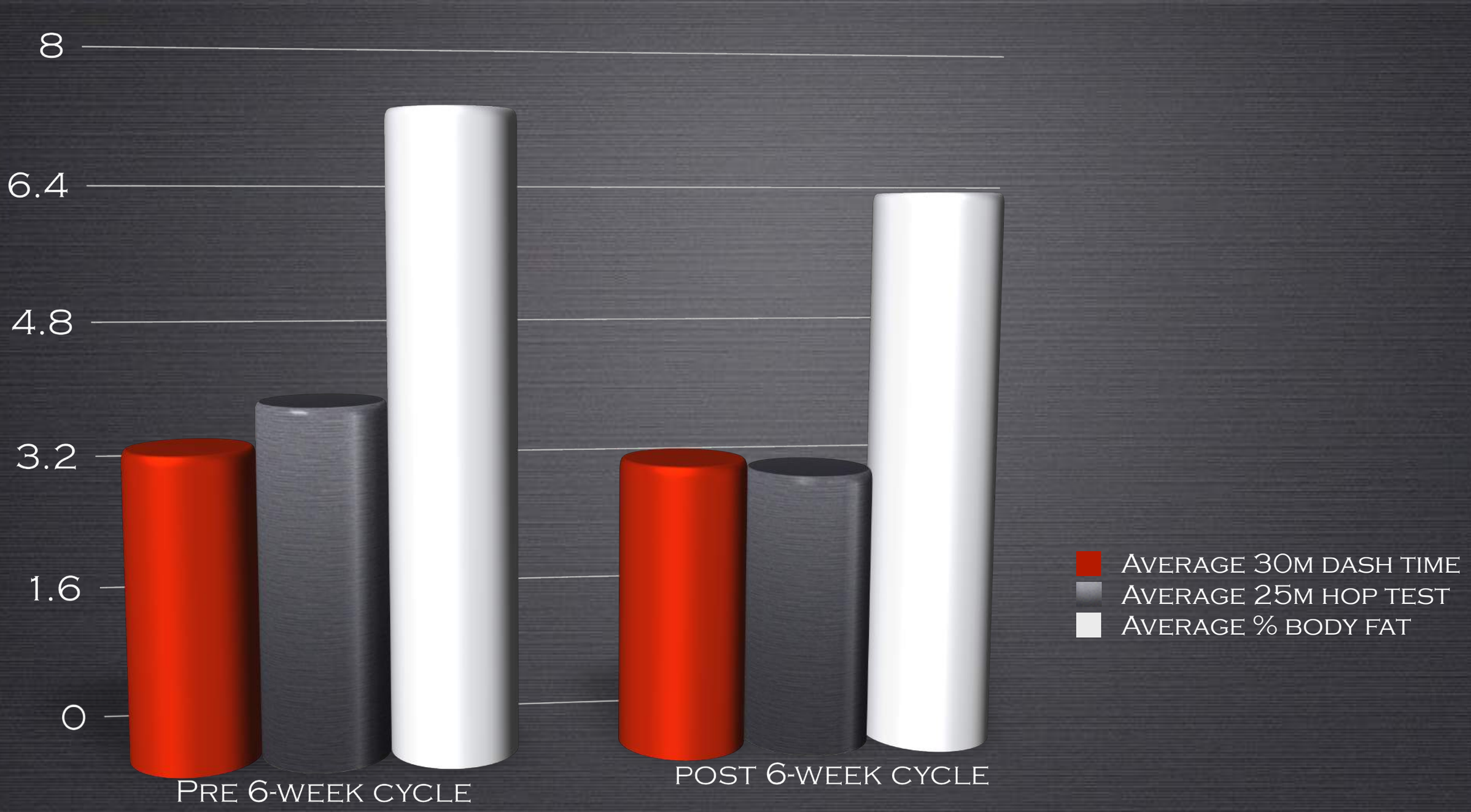
DB Incline Bench Press

Bench Pullover

Sample: CORE CIRCUIT

THE 6-WEEK PROPRIOCEPTION & KINESTHESIA MODEL (KYPRIANOU ET.AL 2007)

- 8 % OF BW WEIGHT VEST (WEAR ALL DAY EXCEPT PRACTICE)
- 'FOOLING BRAIN' WITH BALANCING TRICKS (WEIGHT CHANGES)
- TESTOSTERONE LEVELS VS CORTISOL/GLUCAGON LEVELS
- 5-10% PERFORMANCE IMPROVEMENT PER CYCLE (6-WEEK)
- MESOCYCLE USED: 2 @ 90% + 1 @ 72% + 1 @ 50%

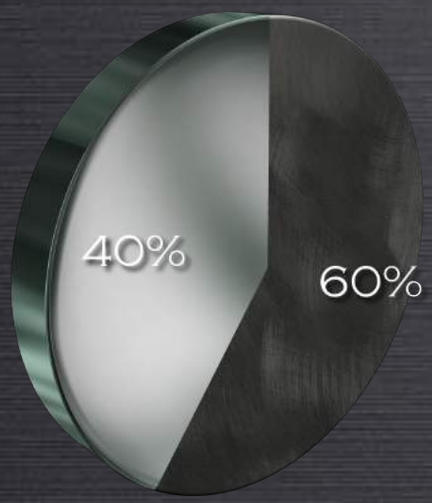


- 11 male jumpers (HJ-LJ-TJ) as part of observation
- mean age 23 ± 1
- post testing performed following super-compensation week

SAMPLE ANNUAL PLAN IN %

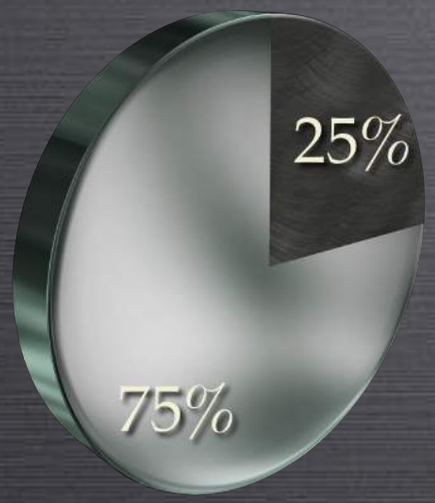
VOLUME INTENSITY

OFF-SEASON



- CORE & STABILITY
- OLYMPIC LIFTS PROGRESSIONS
- SIMPLE POST ACTIVATION EXERCISES
- NON IMPACT JUMPS
- 5-6 REPS, 5-6 SETS

PRE-SEASON

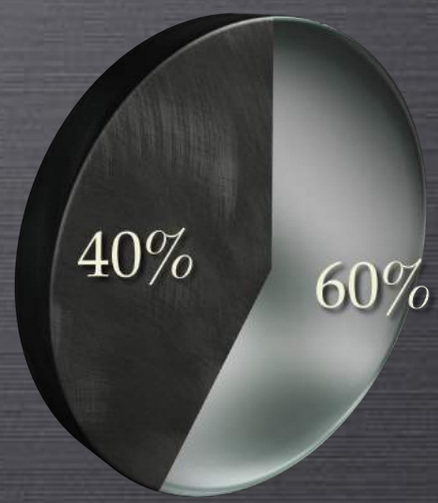


- CORE & STABILITY
- OLYMPIC LIFTS ADVANCED
- COMPLEX POST ACTIVATION EXERCISES
- MEDIUM IMPACT JUMPS
- 1-3 REPS, 3-5 SETS

IN-SEASON INDOOR

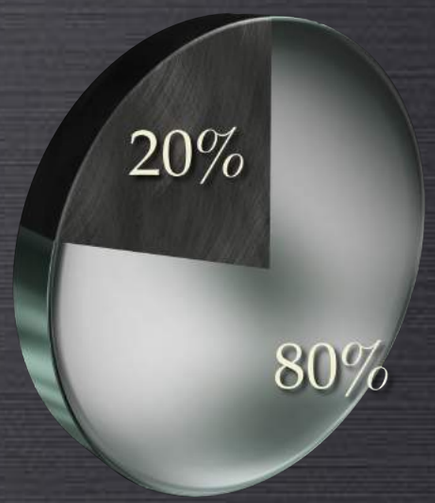
- LIGHT ROTATIONAL & BALLISTIC CORE
- OLYMPIC LIFTS: BAR SPEED
- COMPLEX POST ACTIVATION EXERCISES
- HIGH IMPACT JUMPS
- 1-3 REPS, 3 SETS

TRANSITION



- CORE & STABILITY
- OLYMPIC LIFTS PROGRESSIONS
- SIMPLE POST ACTIVATION EXERCISES
- NON IMPACT JUMPS
- 5-6 REPS, 5-6 SETS

IN-SEASON OUTDOOR



- LIGHT ROTATIONAL & BALLISTIC CORE
- OLYMPIC LIFTS: BAR SPEED
- COMPLEX POST ACTIVATION EXERCISES
- HIGH IMPACT JUMPS
- 1-3 REPS, 3 SETS

summary

- Failing to plan is planning to fail" -John wooden
- Optimizing training progress - Rest as Hard as You Train!
- Goals: avoid overtraining! perform at peak
- Super-compensation Week: use it!
- Science & Application = Experience!

Thank You!!
..and go dawgs!