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Head S&C Indiana Football

“Indiana S&C”

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ATHLETE DEVELOPMENT SYSTEM AND STRATEGIES

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EXPERIENCE AND BACKGROUND

- Played Football at Indiana University
- After injury senior year worked at student intern in the weight room
- Head Strength Coach at Avon High School (2002 – 2015)
- Head Football Strength Coach at IMG Academy (2015-2016)
- Co-Director of Strength and Conditioning for Football – University of Notre Dame (2016-2017)
- Head Strength Coach – Indiana University (Current)



GENERAL FOOTBALL S&C PHILOSOPHY

To implement a system that leads to as much transfer to the football field as possible, we will systematically design a program that will help prevent injuries, attack flaws/weaknesses, improve strength, and most importantly make fast explosive football players. This will be done along with promoting physical and mental toughness while being held accountable to teammates and the program.



FOOTBALL STRENGTH & CONDITIONING

OUR PROGRAM

- Limitation focus
- Transfer of training drives exercise selection
- Periodization based on readiness
- Individualized training



TRANSFER OF TRAINING

- The degree to which an exercise transfers to a specific skill
- Relates to specificity of training
- Transfer may be a good measure of "specificity"
- The greater the transfer, the greater the value to a specific athlete



MEASURING TRANSFER

Zatsiorsky proposed the following equations:

$$\text{Transfer} = \frac{\text{Improvement in skill}}{\text{Improvement in exercise}}$$

$$\text{Result Gain} = \frac{\text{Gain in performance}}{\text{Standard deviation of performance}}$$

Zatsiorsky, VM (1995). Science and Practice of Strength Training. Human Kinetics: Champaign, pgs. 9-11.



VELOCITY BASED TRAINING

- Speed is a primary differentiator between players in football so it should be the focus of our development program
- Because exercise readiness changes differently for each player throughout the week, prescribing specific loads is not optimal
- Periodization of speed (at whatever load is appropriate that day) results in better gains
- Speed Strength (1.0 - 1.3 m/s)** - Utilizing lighter loads at very fast velocities, speed is first priority with strength being second
- Strength Speed (.75 - 1.0 m/s)** - Moving a moderate heavy weight as fast as possible
- Accelerative Strength (.50 - .70 m/s)** - Driving against a heavy load as fast as possible
- Absolute Strength (.20 - .50 m/s)** - Ability to exert force maximally and move towards increasing 1RM



DIFFERENT MODALITIES TO USE FOR VBT

- Gymaware, Push Band, Elite Form, Tendo
- If don't have the financial ability to purchase the above:
 - Use a stopwatch per sets
 - Create your own standards by time
 - Use to chart different position groups
 - Set clubs and standards for your players to reach (motivation)



PERCENTAGE TO VELOCITY RELATIONSHIP


1RM (%)	1RM (kg)	Speed (m/s)
1.24	100	Speed Strength
1.24	100	
1.13	90	
1.06	80	
0.97	70	Strength Speed
0.89	60	
0.82	50	Accelerative Strength
0.73	40	
0.65	30	
0.58	20	Absolute Power
0.52	10	
0.43	0	



PERCENTAGE TO VELOCITY RELATIONSHIP

Peak Velocity Max Predictors/ Power Clean


Peak Vel.	% 1 RM	Speed zone
2.70	80%	Speed Strength
2.60	75%	
2.50	70%	
2.40	65%	
2.30	60%	Strength Speed
2.20	55%	
2.10	50%	Accelerative Strength
2.00	45%	
1.90	40%	
1.80	35%	Absolute Power
1.70	30%	
1.60	25%	



PERCENTAGE TO VELOCITY RELATIONSHIP

Peak Velocity Max Predictors/ Strug Pull (Hang)


Peak Vel.	% 1 RM	Speed zone
2.70	80%	Speed Strength
2.60	75%	
2.50	70%	
2.40	65%	
2.30	60%	Strength Speed
2.20	55%	
2.10	50%	Accelerative Strength
2.00	45%	
1.90	40%	
1.80	35%	Absolute Power
1.70	30%	
1.60	25%	



PERCENTAGE TO VELOCITY RELATIONSHIP

Peak Velocity Max Predictors/ Hang Clean

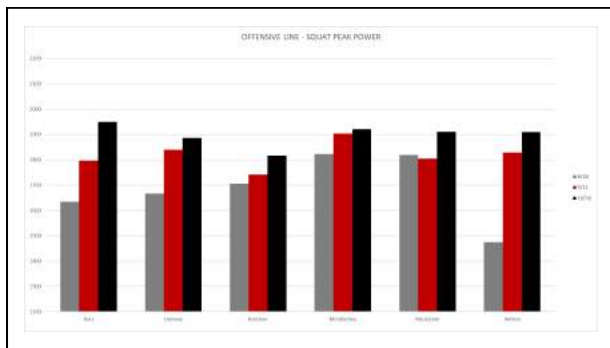
Peak Vel.	% 1 RM	Speed zone
2.60	80%	Speed Strength
2.50	75%	
2.40	70%	
2.30	65%	
2.20	60%	Strength Speed
2.10	55%	
2.00	50%	Accelerative Strength
1.90	45%	
1.80	40%	
1.70	35%	Absolute Power
1.60	30%	
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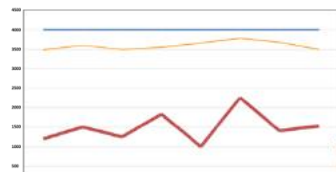
TRACKING POWER

- Instead of just using the term "Explosive", wanted a way to track it and measure it.
- After tracking and evaluating data, settled on using Peak Power as that measurement
- In looking at data and evaluating personnel by Peak Power, weaknesses and flaws start to show themselves
- Found that using VBT in programming helped drive up these power numbers
- Track data year round including in-season (use as a readiness measure)





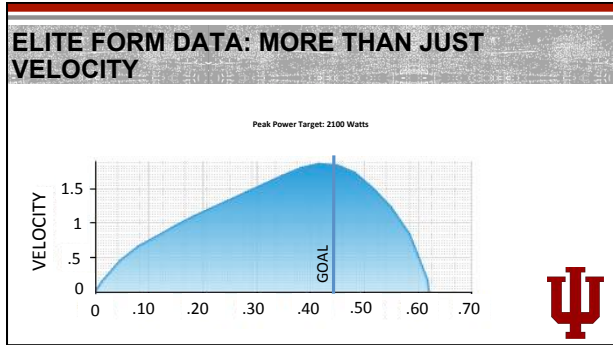
SPLIT JUMP TESTING



- As symmetry improves, speed improves even in the absence of power increase







ELITE FORM DATA: MORE THAN JUST VELOCITY

SKILL PLAYER	LINEMAN	BIG SKILL PLAYER
<p>ELITE FORM PERFORMANCE REPORT</p> <p>SPEED SQUAT VELOCITY</p> <p>These graphs demonstrate how quickly the athlete produces force in three reps of a speed squat.</p> <p>In football, the player who can reach peak velocity in a shorter time has an advantage. The vertical line represents the amount of time to produce peak force. An elite player spends less time (1.21 sec.)</p> <p>We are using specific training techniques to modify the athlete to reach peak speed, and force faster. Over time, we should see the graph in the graph move to the left. As a result we will have a faster, more explosive player.</p>	<p>ELITE FORM PERFORMANCE REPORT</p> <p>SPEED SQUAT VELOCITY</p> <p>These graphs demonstrate how quickly the athlete produces force in three reps of a speed squat.</p> <p>In football, the player who can reach peak velocity in a shorter time has an advantage. The vertical line represents the amount of time to produce peak force. Research shows that elite players spend an average of 1.21 seconds to reach peak force.</p> <p>We are using specific training techniques to modify the athlete to reach peak speed, and force faster. Over time, we should see the graph in the graph move to the left. As a result we will have a faster, more explosive player.</p>	<p>ELITE FORM PERFORMANCE REPORT</p> <p>SPEED SQUAT VELOCITY</p> <p>These graphs demonstrate how quickly the athlete produces force in three reps of a speed squat.</p> <p>In football, the player who can reach peak velocity in a shorter time has an advantage. The vertical line represents the amount of time to produce peak force. Research shows that elite players spend an average of 1.21 seconds to reach peak force.</p> <p>We are using specific training techniques to modify the athlete to reach peak speed, and force faster. Over time, we should see the graph in the graph move to the left. As a result we will have a faster, more explosive player.</p>