

Power Development For Everyone

Plyometric Training

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The Workshop Overview

- What is power and what are plyometrics
- A brief look at the science
- Exercise performance, adaptation and movement/progression sequences
- Closing Notes

Power

- Physics of Power
 - Calculating Power
 - Looking at numbers
 - Is height of vertical jump that important?
- What You Already Know
 - Body mechanics, arm and leg action
 - Plyometric drills to improve SSC
- What You Should Know But Can't See
 - Acceleration, Inertia, Eccentric Loading Time and Magnitude, and Propulsive Force

Typical Ways to Improve Power

- Plyometrics
- Explosive Lifts
 - Olympic Lifts and variations
- Increase Strength
- Increase Speed

Components of Being Powerful

- Acceleration and Propulsive Force Overcoming Inertia
- What Are Plyometrics?
 - Power through plyometrics is the ability to convert an Eccentric Load into a Concentric Action (activating the SSC) as rapidly as possible
 - Resistance to stretch and or time to handle load will ultimately slow this pattern down.

Components of Being Powerful

- Eccentric Loading Time and Magnitude
 - In Plyos, time in contact with ground/hands is know as amortization time
 - Long amortization time decreases transfer of energy to the concentric
 - Magnitude refers to “how great” the load is, hence depth jumps and other “shock level” plyos are used to increase this
 - Increasing magnitude improves power only if it can be handled properly

Power Through Plyometrics

- What are we training
 - SSC, strength and speed
- Why power and plyometrics
 - Integral part of everyday activity and all sport
- What are the considerations with Plyos
 - Strength and Speed
 - Proper mechanics
 - Proper progression
 - Walk before you run

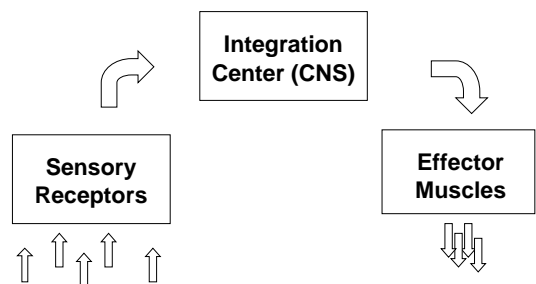
Reaction Time and Power

- Neurological Processing Pathway
 - From thought to execution
- Interpreting a Stimulus
 - All senses contribute
- Speed Up Reaction
 - Power improves
 - Rate of loading improves

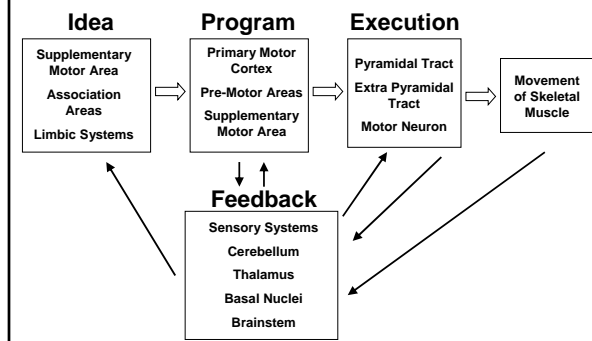
Reaction Time

- Purpose of reaction training is to stimulate motor recruitment speed and to try to make movement “automatic”
- Reaction With a Correct Action is Most Important
 - Process the Information
 - Send the Correct Sequence
 - Execute The Proper Movement

Reaction is a Planned Movement



From Thought to Execution: The Integration Center



Joint Impact and Training

- Examine joint structure and vulnerability as well as ability for muscle to develop force and withstand stretch
- Using Newton's Law ($F=ma$) we can calculate force of impact in a perfectly inelastic situation – NOT REAL LIFE
- Key to receiving force is to dissipate it
 - How to do this effectively
 - Make force work for you
- Key to giving force is to concentrate it.
 - Reduce “errant” forces

Acceleration/Propulsion Training

- Driving Force To Move The Body
- Most Important in Sport:
 - First 5 to 10 yards
 - If your athlete cannot move fast in the first few steps, you are out of the play
- Drill Purpose:
 - Increase force of drive (thrust), overcome inertia, and decrease drag
- Types of Drills
 - Short acceleration sprints, agilities, long jump and variation, single leg squat, lunge and jump exercises

Eccentric Load Training

- Rapid and/or Large Pre-Loading of Movement
- Separately Trained From Power
- Drill Purpose:
 - Increase ability to load eccentrically WHILE MAINTAINING PROPER BODY POSITION
- Types of Drills:
 - Drop landings, speed loading, deceleration training

Eccentric Loading Exercise

- Deceleration component in agility, ladder, plyometric, and sprint drills
 - Stop suddenly and completely maintaining balance and body position
- Land on balls of feet
 - Just work on perfect landings on the balls of the feet, keeping tension on achilles
- Rapid loading quick feet/hands plyometrics
 - Keep drills short, fast and minimize GCT

Power Training

- Converting Stored (Built Up) Energy to Concentric Force Production
- Drill Purpose:
 - Improve ability to transfer force rapidly
 - Make athlete more explosive
- Types of Drills:
 - Fast feet jumps, general plyos, resisted sprints, resisted jumps, explosive lifts

Power Exercises

- Focus on decreasing time
- Focus on rapid transition from eccentric to concentric (rapid SSC activation)
- Keep resistance light so that bar/body travels rapidly
- 3 to 5 rep sets with enough time to recover completely

Strengthening Exercises

- Increasing Impact Power
 - Band and chain training
 - Release moves allowing follow through
 - 5 yard full sprint finishes on drills (ladders, agilities, etc.)
- Dissipation of Force
 - Drop load landings
 - Reverse lunges
 - Dynamic movement to static hold

Summary

- Training should not be about developing gimmicky exercises
- Don't over think, but think it through
- Coach one skill at a time
- Use progressions and ensure good strength before worry about speed
- Focus on improving mechanics
- Focus on drill performance more then speed at first then progress