

COACH VEGAS

(702) 907-1942

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SPORT METHOD TRAINING™ PLYOMETRICS

Plyometrics are drills and exercises aimed at linking sheer strength and speed of movement to produce an explosive reactant-type movement. The term is often used to refer to jumping drills or in-depth jumping, but plyometrics can include any drill or exercise using the stretch reflex to produce an explosive reaction.

THE JUMPS

In-Depth Jumping - Exercise using the body weight of the athlete and gravity to exert force against the ground are known as in-depth jumping. In-depth jumps are done by stepping off a box from heights of 0.75-1.10 meters. Upon making contact with the ground, the body is moved directly upwards as rapidly as possible. The key to successful development of explosive reactant-type movement is a "touch and go" type action off the ground when performing an in-depth jump.

The in-depth jump demonstrates the use of the stretch reflex. When the athlete lands on the ground, the hip extensors (gluteus muscles) and the leg extensors (quadriceps) lengthen rapidly in an eccentric type of contraction. This part of the jump is known as the *amortization phase*. The rate of stretch on the muscles elicits a stretch reflex, which results in the supramaximal contraction of the extensors muscles. Although only a moderate amount of stretching occurs, the rate of stretching is great.

Jumps In Place - Jumps in place are exercises requiring limited space and equipment that serve to develop the neuromuscular reactivity to the ground. The stimulation of ground contact followed by immediate take-off is essential to reduce the amortization, or "time spent on the ground" phase.

Standing Jumps - Standing jumps are exercises employed to maximal effort with both vertical and linear components. These are single repetition, maximal efforts. The drill itself may be repeated several times. Examples: Standing log jumps, standing triple jumps, and jumps over cones.

Multiple Jumps and Hops - Multiple jumps and hops utilize the skills developed in the jumps in place and standing jumps. The exercise includes double and single leg hops, hurdle or cone hops and box jumps.

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PLYOMETRICS TRAINING PROGRAM

Forward

Walking lunges
Two-foot hops
One-foot hops
Single-leg jumps
Bounding two feet
90 degree hop-jumps
Tuck jumps

Backward

Lunges
Two-foot lunges
90 degree hop-jumps

Sideways

Lunges
Back-leg standing hops
Two-foot tuck jumps
Two-foot hops

Partner

Squat jumps 2x10
Skate jumps 2x10

Plyo-Balls

Overhead soccer throws 2x10
Hitting rotation chest passes 2x10
Chest passes 2x10
Long throws 2x10
Hammer throws 2x10

LATTER FIELD TRAINING PROGRAM

Key Points

- Stay on pads of feet
- Arms at 90 degrees
- Helps with foot quickness and agility
- Helps with coordination and power on first step

Forward

Run thru x2
Two feet x2
Right hop x1
Left hop x1
Two hops each x2
Two hops every other x2
Skiers in x2
Skiers out x2
One two out x2
One two in one two out x2

Sideways (laterals)

Carioca left and right x1
Right foot over x2
Left foot over x2
Side scissors each direction x1
One foot in each direction x1
Chop step two each box x1

Backwards

Two foot hops x2
Two feet each box x2

PAIN/INJURY: For specific agility work, consult an athletic trainer or head conditioning coach. If you are unable to do the Plyometric or Latter Field exercises without pain, it may be better to hold off on the exercises.

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MUSCLES IMPACTED & DEFINITIONS

Myotatic/Stretch Reflex – A myotatic reflex is a reflex that responds to the rate of muscle stretch. This reflex has the fastest known response to stimuli (in this case the rate of muscle stretch). The myotatic/stretch reflex elicits *contraction* of the homonymous muscle (the same muscle that was stretched) and synergist muscles (those muscles surrounding the stretched muscle that produce the same movement) and *inhibition* of the antagonist muscles (those muscles that produce an opposing movement).

Mono-Synaptic Junction - A mono-synaptic junction is a direct connection from a sensory neuron to a motor neuron. Most reflexes involve several synaptic connections, or junctions, before eliciting a response. A mono-synaptic reflex, therefore, has the fastest response to a stimulus. The only true mono-synaptic reflex known is the stretch reflex.

Proprioceptor – Any mechanism that monitors change in the body is a proprioceptor. Proprioceptors conduct sensory reports to the central nervous system from muscles, tendons, ligaments, and joints. These sensory reports are about orientations, angle of joints, degree of muscle shortening/lengthening and velocity of stretch.

Muscle Receptors – Muscle receptors are proprioceptors that monitor systems related specifically to skeletal muscles. These receptors include the Golgi tendon organ and muscle spindle, which send information to higher brain centers about muscle tension, static length, velocity of stretch and pressure.

Muscle Spindle – One of the most elaborately structured intrinsic receptors of the body is the muscle spindle. It conveys information about the muscle to the central nervous system. It is located within the muscle parallel to the extrafusal fibers. This feature allows the muscle spindle to be sensitive to muscle length. The muscle spindle monitors a muscle's static length, change in length and pressure.

Intrafusal Fibers – Located within the muscle spindle, the intrafusal fibers have a contractile component that maintains the sensitivity of the muscle spindle at various lengths. Intrafusal fibers do not participate in developing external tension, but instead serve as a sensory organ.

Cocentric/Isotoni/Dynamic Contraction - Cocentric/isotoni/dynamic contraction is a contraction in which the muscle develops tension while shortening.

Eccentric Contraction – An eccentric contraction is a contraction in which a muscle develops tension while lengthening. An example of an eccentric contraction is seen during the down phase of a squat. The quadriceps are still producing tension, but the muscle is lengthening, i.e., muscles are in a yielding phase.

Amortization Phase – The amortization phase is the eccentric, or yielding, phase of an activity. Amortization occurs just prior to the active, or push-off phase of an activity and includes the time from ground contact to reversal of movement.