

PLYOMETRIC TRAINING:

The Power behind the Player

By Terence McWilliams: Ulster Games Manager

What is Plyometric Training?

Plyometric training seeks to improve the explosive force production of a player through powerful contractions of a muscle group immediately following a stretching or eccentric (lengthening) phase.

Basically, plyometric training increases the rate at which your muscles produce force.

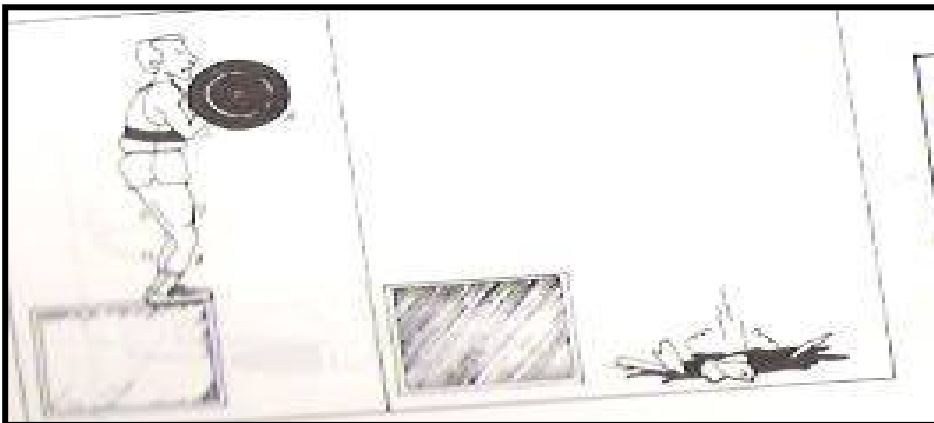
They bridge the gap between strength and speed.

Unlike weight training which operates on a concentric-eccentric sequence, plyometrics operates in the reverse way.

The eccentric phase involves varying degrees of muscle lengthening and is sometimes referred to as preload or prestretch.

Plyometrics are the icing on the cake, they are the ingredients which will dramatically increase your speed and power.

Plyometrics help enhance; Jumping Ability, Velocity & Acceleration off the mark = Explosive Power.



Some key points:

- ✓ Plyos. help to deliver force as fast as possible
- ✓ Should only be attempted when players have very good core stability
- ✓ Players should have started a weight training programme
- ✓ Players should be able to squat 1½ times own body weight before attempting plyos
- ✓ Intensity + Volume + Frequency + Rest = Success
- ✓ Use 2 or 3 days per week
- ✓ 3 month build up – x 3 sessions per week for improvement and 1 after to maintain

- ✓ It should be linked in with your other training i.e. early season intensity should be 70/80% and increase to 100% around championship
- ✓ Volume: Build from 40 Touches to 100 + Touches
- ✓ Touch = Touch down with 1 or 2 feet on the ground
- ✓ Use common sense - watch your players as they perform
- ✓ Always use double feet tasks before introducing single foot tasks

2 Categories:

1. Single Response – Intense effort – emphasis on power e.g. Depth Jumps from box
 2. Multiple Response – More emphasis on speed e.g. jumps over several hurdles
 - ✓ Use early in training session – Build from 10mins. to 20mins.
 - ✓ Use before weight training session
 - ✓ Build from Basic Plyos through Intermediate to Advanced Plyos
 1. Basic = Skips, Bounds
 2. Intermediate = Stationary jumps in situ e.g. tuck, lunges etc.
 3. Advanced = 2 & 1 Foot jumps/hops while moving to Depth jumps from box
 - ✓ Sets: 3 to 8 Rests Between Sets: 1 min. to 7/8 mins. As season progresses. Allow about 90% recovery
 - ✓ Reps: 4 to 10: Work 10 secs. Rest: 20 secs. Stop when good form goes
 - ✓ Link into circuit 30secs. Work 30secs. Rest
 - ✓ Testing – Every 3 weeks: Use vertical jumps, Depth jumps – Height, Medicine Ball pass
 - ✓ Keep adjusting intensity and overload every 3/4 weeks
 - ✓ Only use 3/4 drills in any session
- N.B. Carelessness from poor supervision in bounding, jumping etc. can result in injury.

Sample Warm Up:

Basic Plyos.

- ✓ Dynamic Warm Up 10 – 15 mins.
- ✓ Lunges 45° Forwards & Backwards
- ✓ Back Peddle, side ways etc. Coach indicates audio and visual.
- ✓ Coach indicates what to do by pointing.
- ✓ Do opposite. E.g. Stand, sit, lie etc.
- ✓ Easy skips build to high skips – non take off knee driving up hard
- ✓ All children should skip regularly as this is their first plyo type of exercise along with activities like hop scotch etc.
- ✓ Use variations in your skipping e.g. 2 hops right foot followed by 2 hops left foot etc.
- ✓ When skipping properly i.e. at max. speed you should not hear their feet
- ✓ 2's Press ups facing each other push hand away.
- ✓ 2,s Piggy Back & Under: No. 1 attempts to go over his partner and under his legs as many times as possible in 30 secs.

Reactions:

- ✓ Colour Vision: Players going through ladders call out nos. of fingers held up by coach as they go through or hold up dif. Col. Domes etc.
- ✓ Place lines of col. Domes in front of players who run to the first line and execute a cut, side step or turn on call from coach.

Strength/Balance:

- ✓ 2's facing each other – One hand push off R/H & L/H
- ✓ 2's Both trying to wrestle a Swiss ball from each other
- ✓ Wrist Boxing – Both catch each others wrists with one hand free to slap face of partner
- ✓ Cat Springs – Aim to cover as much ground as possible by reaching as far forward as you can with your hands, as the feet come to rest use them to spring forward before taking weight on the hands again. This is an excellent activity for building upper body strength.

Ladder Work:

- ✓ 1 min. work x 1 min. rest
- ✓ Set out 4 Dif. Col. Ladders with 4 lines of 4 players in each line opposite
- ✓ Coach shouts instructions for first 4 players to go to execute desired task etc.
- ✓ E.g. Inky Shuffle – All players attempt Inky Shuffle etc.
- ✓ Players to do different actions through the dif. Coloured Ladders e.g. Blue ladder = Icky shuffle etc.
- ✓ 2's going through 4 ladders in a cross
- ✓ One player with the ball carries out task set by coach
- ✓ No. 2 moves on signal for the tackle
- ✓ A third player waits with a tackle bag to hit No. 1 as he enters end zone
- ✓ This player could finish with a shot on goals

Dumbbells: Arm Strength

- ✓ Hold Dumbbells – One in each hand
- ✓ On signal move both dumbbells as fast as possible for a set time
- ✓ All jumps etc. may be challenged further by adding dumbbells

Speed Belt:

- ✓ Place 3 different colours in an arc in front of player attached to belt
- ✓ He starts to move forward and on call from coach he must sprint with high knee lift to colour called before backtracking and going again etc.
- ✓ Coach may make it easier or harder by stepping forward or back.

Parachutes:

- ✓ Run and cut on signal from coach in front. Use two parachutes in calm conditions.

Power Bags:

Power Bag Lifts: Are more functional than free weights and may be used in all training sessions.

SAFETY:

Feet: Shoulder Width Apart – Toes pointing slightly out from the body

Head: Up and looking forward at ALL times

Back: Straight with belly button sucked in against the back bone in all lifts

Lunge Walk:

- ✓ Use power bag to lunge walk forwards, backwards and sideways
- ✓ 1's Hold power bag in front squat position and sprint with high knee lift for 10/20m

Triceps Curl:

- ✓ Start in squat position – Pull to chest and do a nos. of tricept curls
- ✓ Start in squat position – Pull to chest and then overhead
- ✓ Pull up to above head height, place back behind the shoulders

Power Bag Squat:

- ✓ Start in squat position, pull to chest, now pull over head and do a full squat in this position, move to standing and pull over head again
- ✓ Variation; Start in standing position with PB, move down into squat position and then explode up and release PB at last moment

Power Bag Step ups:

- ✓ Use PB on shoulders to step over a PB on ground
 - ✓ Repeat above but use a bench to step onto and off
- Variation: Use PB to run with i.e. High knee lifts etc
Variation: Use PB to jump i.e. squat, split, tuck etc.

Power Bag Press: (Represents the weight lifting Bench Press)

- ✓ Laying on the mat, hold PB at chest level and proceed to do a nos. of PB presses i.e. raise the PB to a count of '1' and lower for a count of '3'

Power Bag Push Ups:

- ✓ Place hands wide on PB and attempt a nos. of push ups
 - ✓ Repeat above but keep hands almost touching
- Variation: Place knees on PB and attempt a nos. of 'cleans' i.e. raise the PB above your head
Variation: Place hands on PB and complete a nos. of Burpees lifting the BP each time!!!

Swings: Muscles of the shoulders and arms as well as the posterior, lateral and anterior trunk

- ✓ Hold a 35 Kg PB out in front of body and keeping arms straight swing around to one side then the other

- ✓ Swing right up over shoulder, stop momentarily, before swinging over the other shoulder
- ✓ 2's Standing 4/5 m apart, throw your PB from different body positions e.g. chest throw, tummy throw, 1 & 2 hand overhead throw, rugby type sling throw from both sides etc.
- ✓ 2's Sitting opposite your partner
- ✓ Aim to throw the PB diagonal to each other

Twists: Works abdominals, latissimus, obliques, lower back, hips, biceps and pectoral muscles

- ✓ 3's or 4's in a line 3/4 m apart
- ✓ Aim to throw the PB by twisting the body in the direction of your partner
- ✓ Abruptly check the initial action with a quick and powerful twist in the opposite direction
- ✓ Release after maximum torsion is reached
- ✓ 2's Start back to back and reach PB around body to partner who continues
- ✓ Repeat and move around the opposite way
- ✓ Move further apart and see if you can still move PB around the body

Sit Ups:

- ✓ Sitting on mat with both feet off mat and knees in crouch position
- ✓ Aim to sit up with PB held in front of the body
- ✓ Touch PB against knees before touching shoulder blades back to mat
- ✓ A variation is where the legs are straight in the classic V sit up position and attempting to do sits with the PB

Knee The Bag:

- ✓ 2's No. 1 Holds PB in front of his body for NO." to bring one knee up as fast as possible to knee the bag

Power Bag Race:

- ✓ 2's No. 1 starts with power bag and tries to get as far up the track as possible i.e. mark out colours at 40 pts. 20m mark, 30pts. 15m mark and 20pts. 10m mark etc which he tries to gain by getting across this line before his shadow passes him.
- ✓ No. 1 may go at any time he wishes with No. 2 starting a few meters back

Circuit Power Bag:

- ✓ Player aims to execute a set nos. of lifts at each station e.g. snatches at 1; Hand cleans at 2, front squat at 3. Bent over rows at 4, Romanian dead lift at 5 etc.
- ✓ Combine ladders with power bags by having dif. Col. Ladders set out in front of player who must perform dif. Foot drills at the dif. Ladders,
- ✓ Power bag throws – players line up behind a line and attempt to throw as far as possible. Use dif. Throws e.g. overhead, sling, back etc.
- ✓ Combine lifts with ladder and sprints e.g. 10 snatch lifts, icky through ladder sprint 20m 10 high catches ladder, 10 cleans etc.

Plyos with Medicine Ball

- ✓ Walking while holding medicine ball out in front of the body
- ✓ Repeat above while lunging – Hold MB out to sides as you walk
- ✓ Repeat above walking backwards

Scoop Toss: Lower back, hip flexors, shoulder girdle, arms and quads

- ✓ Start in squat position with the ball between the legs
- ✓ Extend arms, head up and back straight
- ✓ Thrust hips forward and move shoulders backwards while maintaining full extension of the arms
- ✓ As you drive up wards release MB using shoulder muscles as well as the back, hips and legs
- ✓ Repeat above but catch MB on the way down, take it to the squat position and repeat above.

Wall Toss:

- ✓ Stand in front of a wall, hold MB between your legs and throw as high as possible up the wall.
- ✓ Throw from a standing position and drive from the hips as you release the MB
- ✓ Repeat above but with your back to the wall
- ✓ Stand just in front of the wall and use chest passes to send the MB against the wall as fast as possible for 20secs.
- ✓ Aim to release the MB as quickly as possible from the hands

Partners:

- ✓ Sit back to back and reach MB sideways to partner
- ✓ Move further apart as skill improves
- ✓ Repeat above kneeling and standing

Medicine Ball Sit Up Throw:

- ✓ Sit about 2 m from each other or initially lock feet
- ✓ Take MB lay back with ball and as you come up release MB for you partner to catch, he rocks backwards and then sits up to release ball at top of sit up etc.
- ✓ Variation: 2's No. 1 with a MB stands in front of No.2 sitting
- ✓ No. 2 takes MB from No. 1 at top of sit up with one hand, sits back holding MB, sits up again and hands MB to No. 1
- ✓ No. 2 now takes MB in other hand and repeats sequence

Medicine Ball Leg Toss: Develops full body

- ✓ 2,s No. 1 rolls a medicine ball to No.2
- ✓ No. 2 hangs from an overhead bar with feet just touching the ground
- ✓ As the Ball comes along No. 2 picks up with feet swings back and then forward again releasing ball at end of swing
- ✓ Perform 2 – 4 sets with 8 – 12 reps resting 2 mins.

Chest Throws:

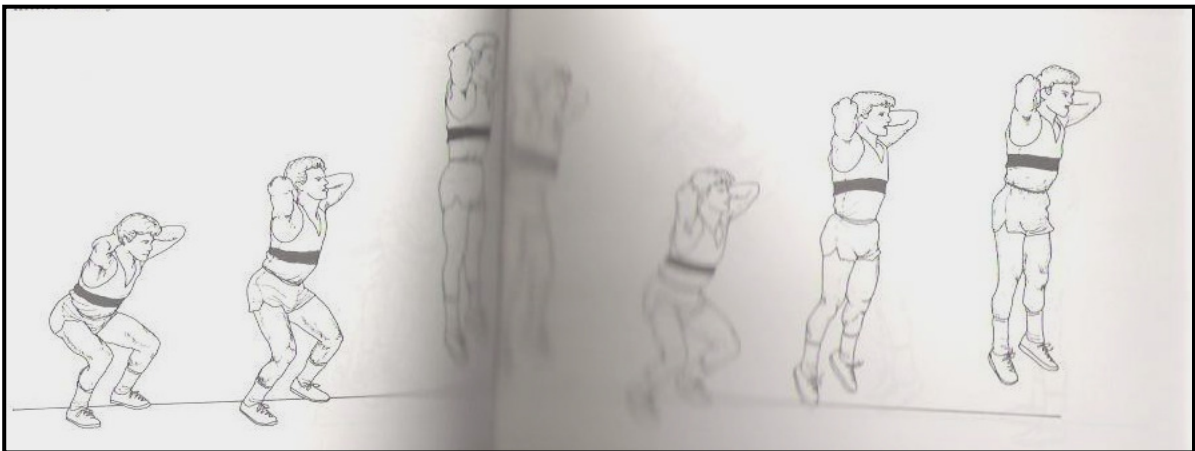
- ✓ Standing 4/5 m apart use a chest or shoulder type of throw to your partner
- ✓ Partner reaches for MB, steps back as he receives the MB but returns it as quickly as possible
- ✓ Link hurdles with MB i.e. Hold MB in front of the body as you step over the hurdle hold leg in air for a short time before stepping over next hurdle etc.

Some examples of Intermediate Type Plyos:

Most of these are from a stationary position:

Squat Jumps: Develops power in the hip flexors, quadriceps, gastrocnemius, hamstrings and gluteals

- ✓ Start in a crouch position and explode up off the ground as high as possible
- ✓ As soon as you land drop down into half squat position but immediately check this down ward movement by driving off hard again
- ✓ Keep hands on hips or at back of head with straight back and drive from hips
- ✓ Try and get the players to imagine that they are landing on burning hot coals!!
- ✓ When skill improves add a ball
- ✓ Repeat above while travelling forward for 6 to 10 jumps



Split Jumps (Lunges): Develops striding power

- ✓ Start in an astride position
- ✓ Drive off hard from this position and as soon as you land drive off hard again
- ✓ Bend legs slightly on landing
- ✓ Use arms to drive body upwards – Keep opposite arm to foot for balance

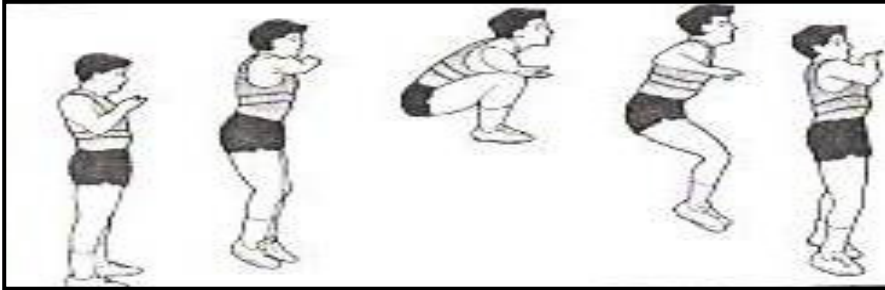
Scissor Jumps: Develops muscles of the lower back, hip extensors, hamstrings and quads

- ✓ A variation of this is where the legs are changed each time in mid air so that a different leg is forward on each jump
- ✓ Another variation is to add dumbbells



Tuck Jumps:

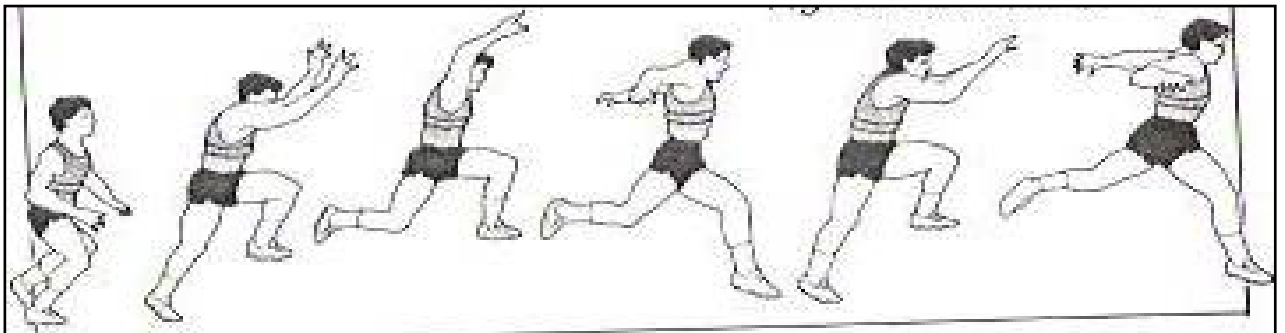
- ✓ Start in a standing position
- ✓ When you take off make a small ball shape at the top of your jump
- ✓ Straighten up before landing and drive off hard as soon as you land
- ✓ Drop to a quarter squat and immediately explode upwards
- ✓ Build from 2 to 4 sets and 10 to 20 reps
- ✓ Repeat above but travel forward for 6 to 10 jumps



Plyos while moving:

Single Leg Bounding: Works the flexors and extensors of the thighs and hips

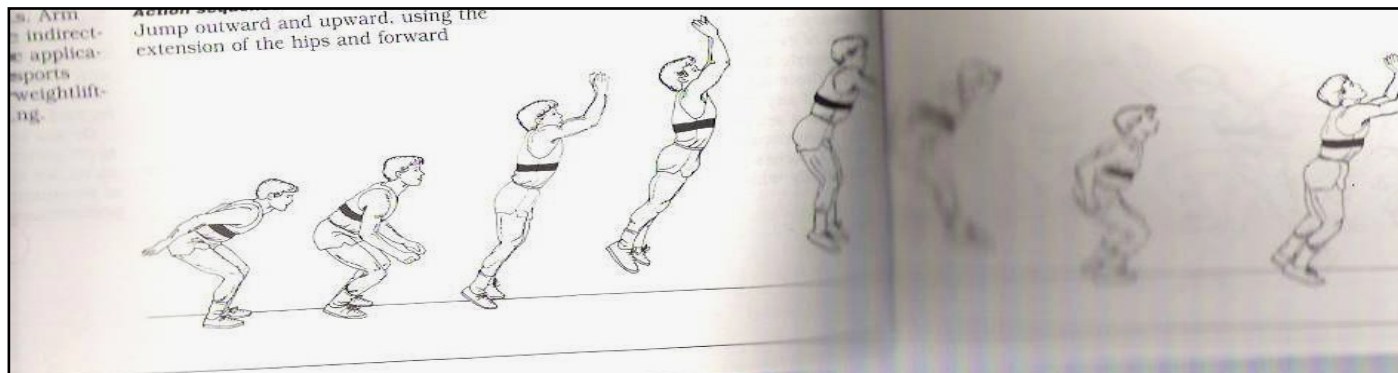
- ✓ Run with long strides over an ever increasing distance as strength improves i.e. 20m to 45m
- ✓ Use a high knee lift and drive hard off the back leg by extending it as much as possible
- ✓ Keep head up and steady at all times with up right body position
- ✓ You could start on a slight down slop and as strength improves challenge the players to bound up hill!!!
- ✓ Use an incline of about 20°
- ✓ Build from 4 to 6 sets and 10 to 20 bounds



- ✓ Concentrate on **'Knees Up/Thumbs Up'** to help maintain balance, centering work load around the hips and legs and developing additional power movements with the upper body

Double Leg Bounds: Develops explosive power in the legs & hips

- ✓ Start in half squat position, with arms down by the sides and shoulders forward and out over the knees
- ✓ Keep the back straight and head up
- ✓ Jump outward and up ward using the extension of the hips and forward thrusting movements of the arms
- ✓ Straighten the body before resuming the starting position
- ✓ Cue: 'Reach for the sky'
- ✓ 3 – 5 Sets of 8 – 10 reps with 2 mins. rest



Single Leg Hops:

- ✓ Use one leg only to cover as much ground as possible with each hop
- ✓ Use a double arm movement for each hop
- ✓ Start with 5/6 hops and build up to 15/20

Double Leg Hops:

- ✓ Use 2 Hops on one leg to cover as much ground as possible before repeating with the other leg
- ✓ Build up the total distance covered gradually as strength improves

Indian Hops:

- ✓ Use a ladder to hop from one side to the other
- ✓ Take a little hop forward each time you land before driving hard off the same foot again i.e. if you land on the right foot. Hop forward onto the right foot before hopping back over the ladder to land on the left foot etc.

Incremental Vertical Jumps:

- ✓ Use a rubber rope or tubing about 15 feet long
- ✓ Attach one end to a pole about 4 feet high and the other end to a tyre
- ✓ Start at lowest end with feet together jump sideways over the rope as far as you can go
- ✓ Bring knees forwards and up wards towards the chest with feet under the bottom

Standing Long Jumps: May be used to test leg power

- ✓ Start in a crouch position and jump as far as you can with each jump
- ✓ As soon as you land explode off the ground with as little foot contact as possible
- ✓ Build up from a few jumps to 10 or more or when form goes
- ✓ Use your arms to drive the body forward each time on landing by bringing both arms back behind the body

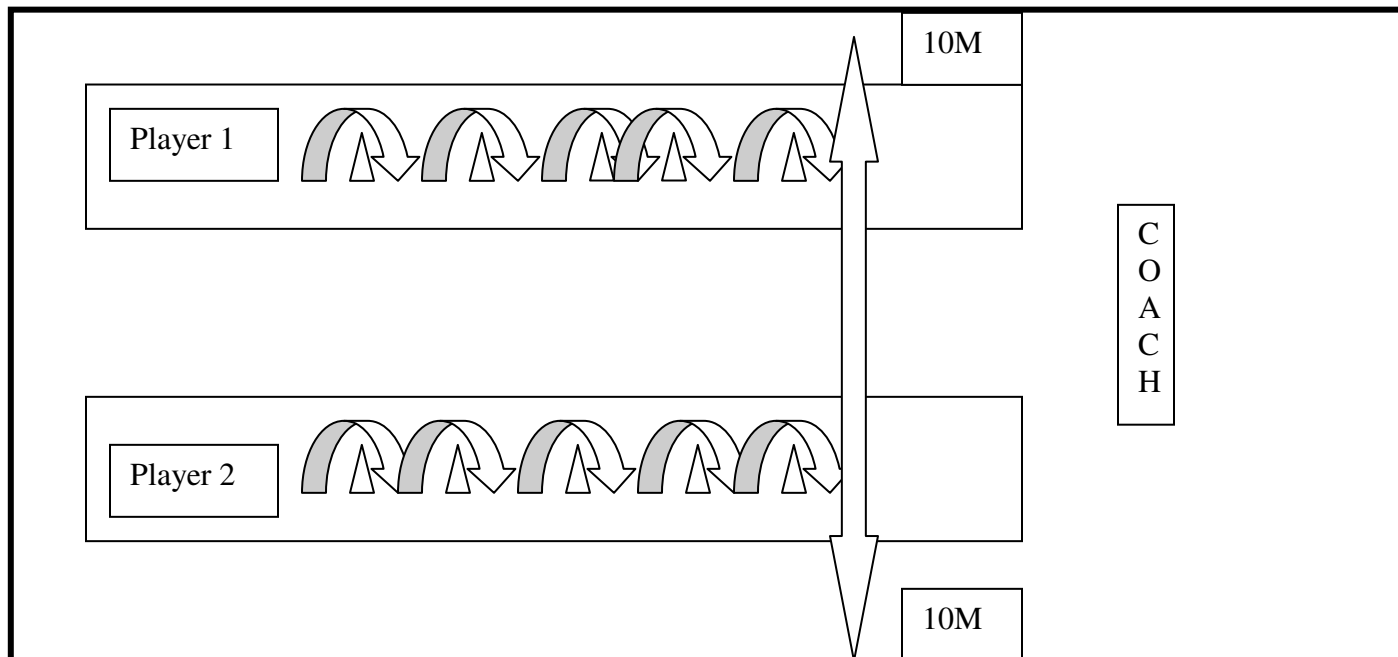
Hurdle Jumps: 2 & 1 Foot

- ✓ Place a nos. of hurdles about ½ m apart
- ✓ The height of the hurdle will depend on the experience of the player
- ✓ Player aims to jump over each of the hurdles as high as possible
- ✓ Start with a few hurdles and add more as power improves
- ✓ Challenge players to sprint away after jumping last hurdle
- ✓ Repeat above jumping sideways over hurdles/cones

Sideway Jumps:

Helps to develop the thigh abductors muscles, stabilizers of the knees and ankles, and enhances lateral power through the legs and hips.

- ✓ Use 2 cones 18/26 inches in height
- ✓ Set both 2/3 feet apart
- ✓ Start out side first cone in a relaxed upright stance
- ✓ Jump sideways over the first cone and then the second one
- ✓ Without hesitation repeat sequence back to start
- ✓ Use the arms in an upward thrusting motion with thumbs up and elbows at 90°
- ✓ Pairs line up opposite two lines of cones
- ✓ Have two rows of hurdles and as both players jump last hurdle coach signals which direction they must sprint to cross 2 marked out lines about 10m apart, just opposite where they land after jumping last hurdle.



Increasing Height Hurdles:

- ✓ Place a nos. of hurdles about 1 m apart but each hurdle is progressively taller
- ✓ The height of the hurdles will depend on the experience of the players

Rapid Jumps (Ricochet's): For reflexive quickness

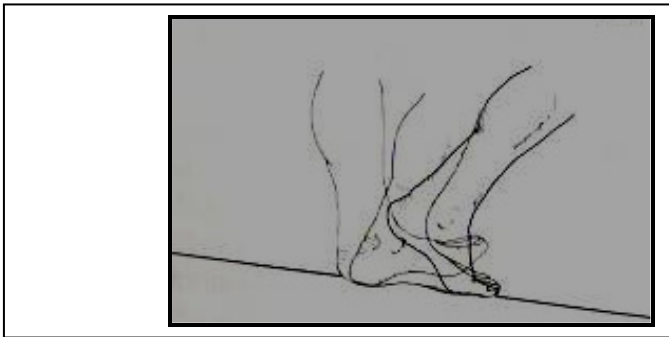
- ✓ Use small fast jumps to cover a small distance e.g. 10m with as many foot contacts as possible
- ✓ Repeat above over small 6" Hurdles spaced ½ m apart
- ✓ Use steps of stadium to jump up or down
- ✓ Use incline to jump up and down

Box jumps: For experienced players only

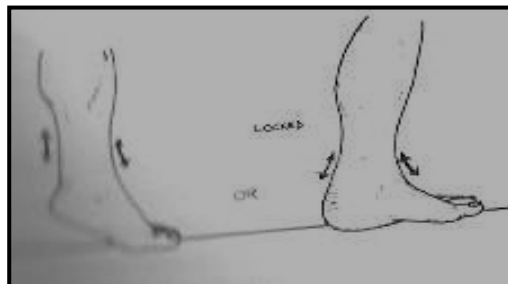
- ✓ Use low boxes 6/12 inches initially before increasing height to 29 inches to develop speed and finally 43 inches to develop dynamic strength
- ✓ Safety use gym mats for soft landings or grass surfaces
- ✓ Bend legs at the knees on all landings

Safety in Landing:

- ✓ Proper foot landings are essential
- ✓ The player should land on the ball of the foot in order to leave the ground as quickly as possible



- ✓ Wrong Landing: Heel to Toe movement is too slow, leading to delay at take off



- ✓ Right landing: Use flat footed landings initially with inexperienced players but move to ball of foot landing as shown above as soon as possible

- ✓ The player should maintain a locked ankle when making contact with the ground

Box jumping is divided into 4 segments:

1. The approach or step off
 2. The landing
 3. The rebound or take off
 4. The final landing
- ✓ The player may begin several meters from the boxes for a quick running or bounding start, working for horizontal jumping e.g. mid fielders when moving to take high catch, or on top of the box or just in front of the first box, focusing on vertical jumping e.g. full back under a high dropping ball
 - ✓ In figure 1 through to 3 the player begins by stepping off the first box and upon landing , explodes in an upward and outward (vertical & horizontal) direction, landing on the second box
 - ✓ This action may be repeated using several boxes

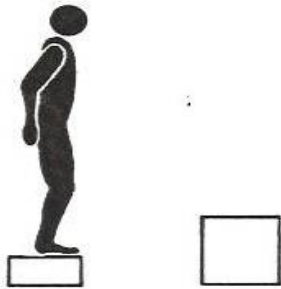


Figure 1. Starting Position for Multiple Box Jump

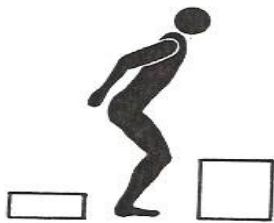


Figure 2. Landing in Multiple Box Jump

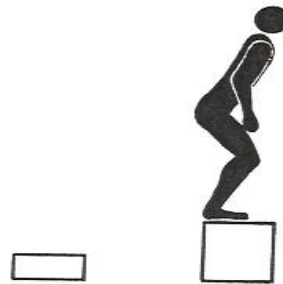


Figure 3. Final Position for Multiple Box Jump

Single Box: 2 Feet Take off

- ✓ Boxes of various heights depending on experience of players may be used to develop power
- ✓ Start with simple step ups from a standing position

- ✓ Keep good core – Head up, Back straight, Lock out at top i.e. straighten legs at knees before stepping down again. Drive off your toes
- ✓ Repeat above but step off other side and step up backwards to step down into original position
- ✓ Repeat above going sideways
- ✓ Progress to jumping from box top to land on ground
- ✓ Repeat above but when you land jump backwards back up onto box and back to starting position
- ✓ Start on ground, jump onto box and drive off again to land on other side before sprinting away
- ✓ Repeat above jumping sideways up and down from box
- ✓ Sprint away on signal from sideways landing

Single Box: 1 Foot Take off:

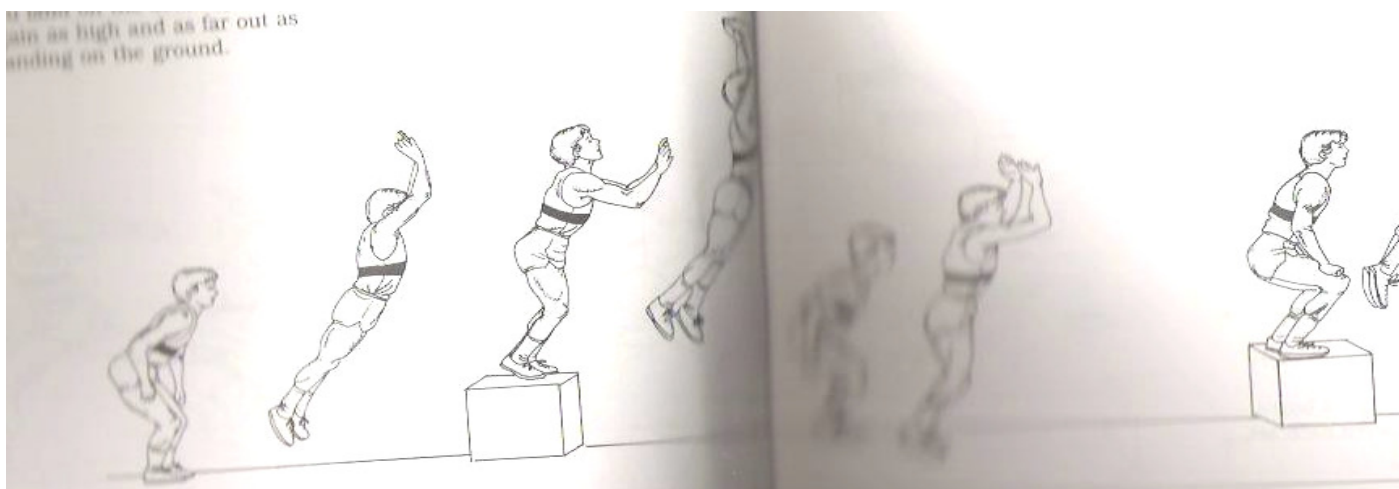
- ✓ Use hops to take off, land on box and drive off hard before landing on other side

Depth Jump: For quads and hip girdle as well as hamstrings and lower back

- ✓ Use 25/43 inch box
- ✓ Stand on top of box with feet just over the edge
- ✓ Drop off as you land explode up into the air by swinging both arms upwards extending the body as high and as far as possible

Multiple Boxes:

- ✓ Use a combination of boxes about 1m to 3 m apart initially before increasing the distance as power improves
- ✓ Start with 2 feet and then introduce 1 foot take offs and landings



- ✓ Start with feet more than shoulder width apart
- ✓ Start in semi squat position

- ✓ Explode onto first box and then explode upward again as high and as far as possible
- ✓ Perform 4 – 6 sets using 2 – 4 boxes with a 2 min rest between sets.

Lateral Lunges:

- ✓ Stand opposite box step onto box with one foot bend at the hips and step back off
- ✓ Repeat with the other leg leading
- ✓ All of the above work on boxes can be challenged further by asking the players to wear weighted vests or dumbbells

Typical Weekly programme:

- ✓ Sat. optimum recovery
- ✓ Sun. off Bike 10 mins. Walk 10 mins. Stretching
B'ball, Swim Water Recovery
- ✓ Mon. Review injuries, Skills session and game pm weights
- ✓ Tues. Weights, Unit skills, set plays, speed
- ✓ Wed. Off
- ✓ Thurs. = Tues. Upper body
- ✓ Fri. Run – captain dictates speeds

Plyometrics for Under 12's

1. Vertical Jumps
2. Push Ups
3. Sit Ups
4. Burpees
5. Bench Press
6. Back Extension
7. Leg Curls
8. Sit Ups
9. Step Ups – Bench
 - ✓ Use the whole season through as this will prepare them for later work
 - ✓ This helps to build strength before puberty and prevent injuries

