

# Power Training

# Power

- aka speed- or explosive-strength, product of force x velocity
- Often characterized as the ability to execute an unloaded movement or a movement against a relatively small external resistance, assessed in terms of speed of the movement.
  - The ability to move rapidly is equally if not more important than maximal force itself
- Skill (technique) should not be underestimated



# Benefits of Power Training

- All else being equal, success in most activities depends on the speed at which force is generated
- Proper power training focuses on whole body movements
  - Human body is built in one piece and must often react at high speeds
- Power is a basic component of fitness
  - Makes the body more responsive
- Develop movement skill



# Benefits of Power Training

- Impact on Movement
  - Improves balance, agility, coordination and rhythm
  - Develop feel for applying force in a sequential manner – from the core/torso outwards.
  - Improves core stability



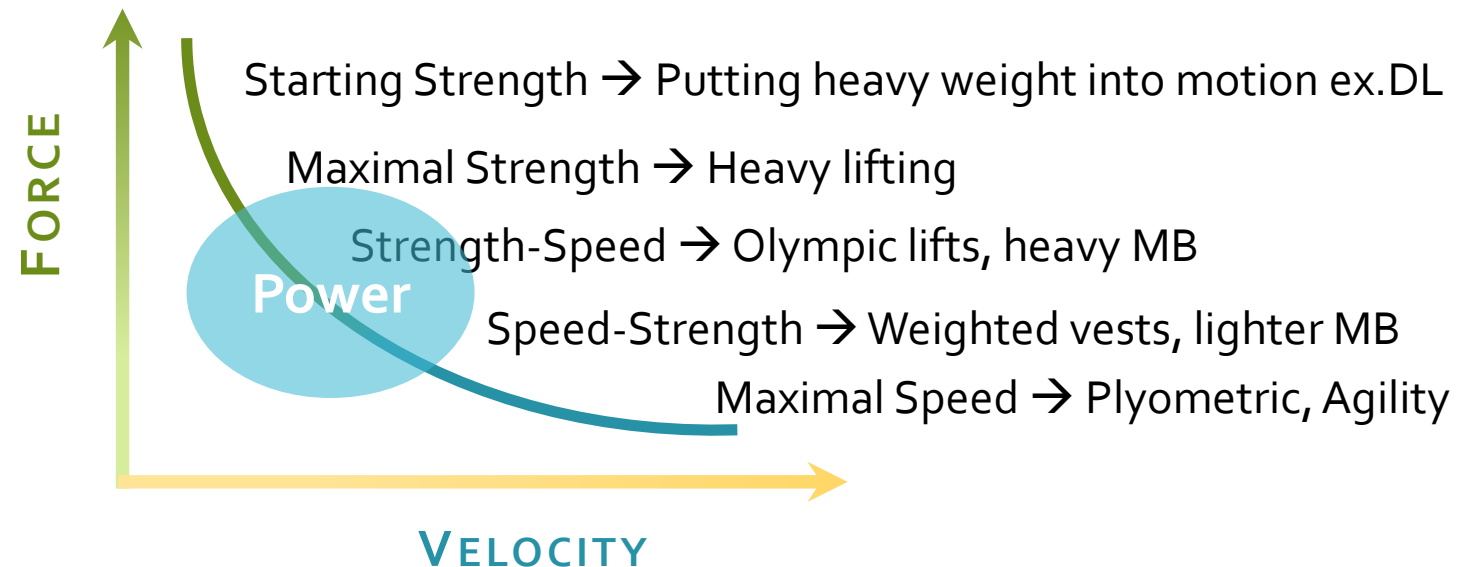
# How to Train for Power

- Strength serves as a foundation
  - e.g. someone who can squat 400-lb should be able to move 225-lb faster than someone who can squat 300-lb
- Generally recommended that strength be addressed before undertaking power training
  - After some time both can be trained simultaneously



# Training Specificity

- Strength adaptation is for the most part specific to the velocity at which one trains
  - Heavy-resistance slow velocities leads primarily to improvements in maximal strength (e.g. the high-force, low-velocity portion of the force-velocity curve) with reduced benefits at higher velocities
- Specialized types of training cause training adaptations of single factors (e.g. high force, high power) only after a base level of strength and power training has been established



## Centre of Power

- Power is primarily generated in the hip / gluteal region, otherwise known as “The Seat of Power”
  - Along with lower back, quadriceps and hamstrings
  - All movements should be initiated from the hips



# Program Design

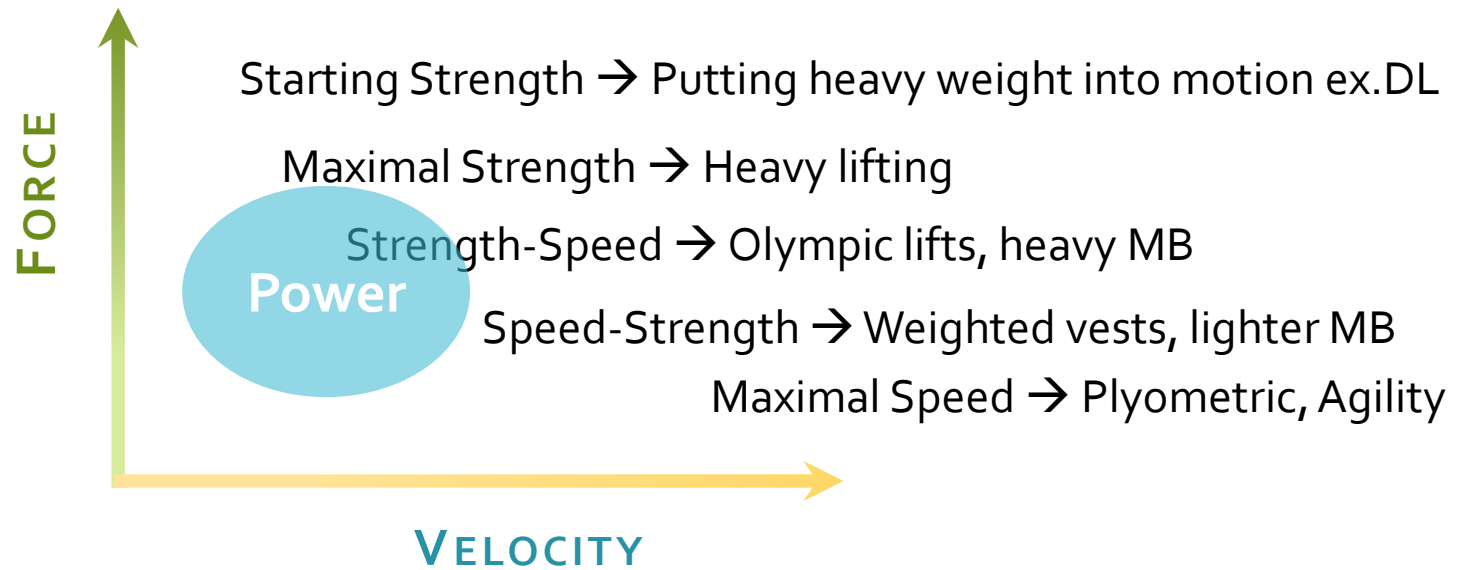
- Balance between force & speed
- Loads: 20% - 80% 1RM
  - For the same exercise used in strength development
    - Squat → jump squat
    - Bench press → medicine ball chest pass
- Maximal movement velocity is mandatory. Requires high levels of concentration (full CNS involvement)
  - Repetitions: 1 – 6
  - Rest between sets: as long as needed to allow for full recovery
- Should only be done with multi-joint movements
  - Never isolated movements.



# Training Methods

- Olympic lifts
- Medicine ball
- Elastic band exercises
- Plyometric
- Medicine ball
- Agility Training

# Agility and MB Drills

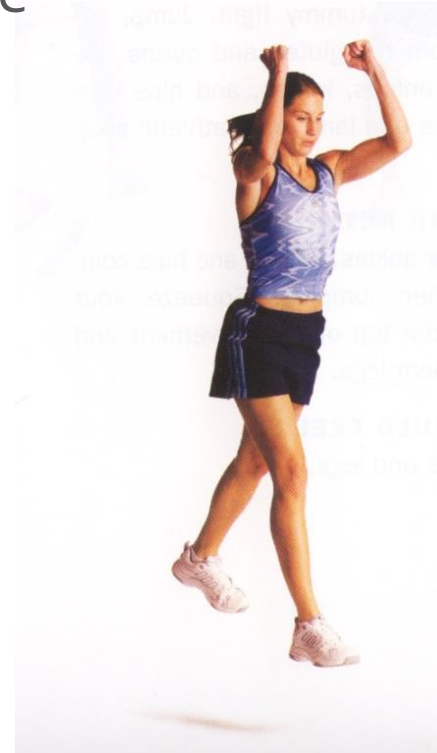


# Agility & Plyometric Drills

- Agility is the ability to change direction rapidly and under control
  - Objective of the following drills is to improve balance along with an introduction to power
  - Drills are performed over a 10 sec period
- Movements in all 3 planes should be addressed

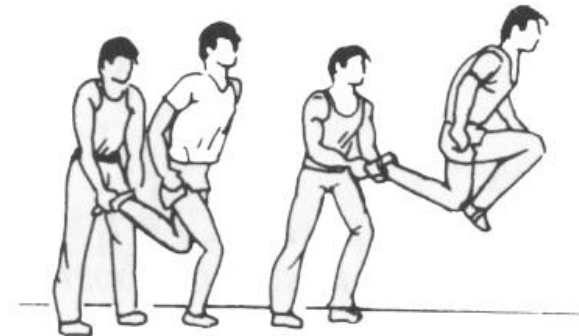
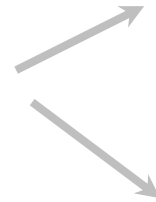
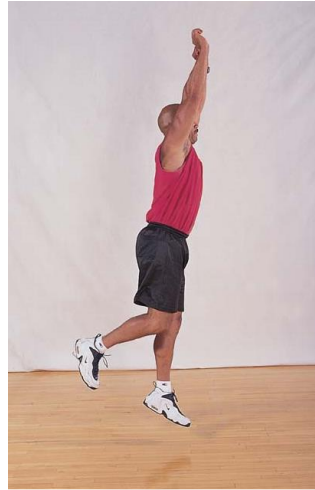
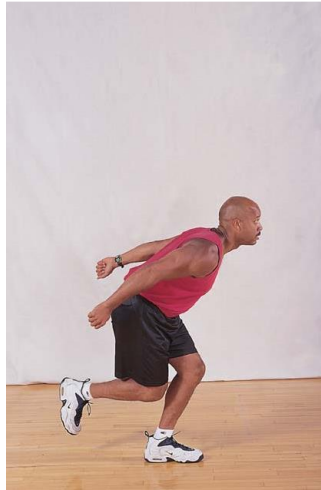
# Split Jump

- Hold the bottom position for 2 sec before exploding upwards, use the arms to help propel the body
- Maintain stability and balance upon landing
- Progression: decrease contact time



# 1-leg Vertical Jump & Stationary Hopping

- 1-leg vertical jump performed 1 rep at a time
- Stationary hopping: multiple repetitions
  - Partner assisted or use a bench for the back leg



# Squat Jump

- Hold the bottom position for 2 sec before exploding upwards
  - Variation: use arms for aid propulsion
- Maintain stability and balance upon landing
- Progression: decrease contact time



# One Leg Over The Line

- This drill requires more hip stability
- Move as quickly as possible while maintaining the hips stable



# Side Step Box Shuffle

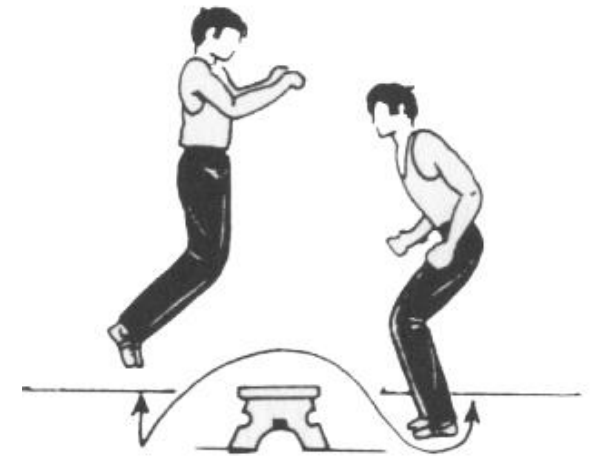
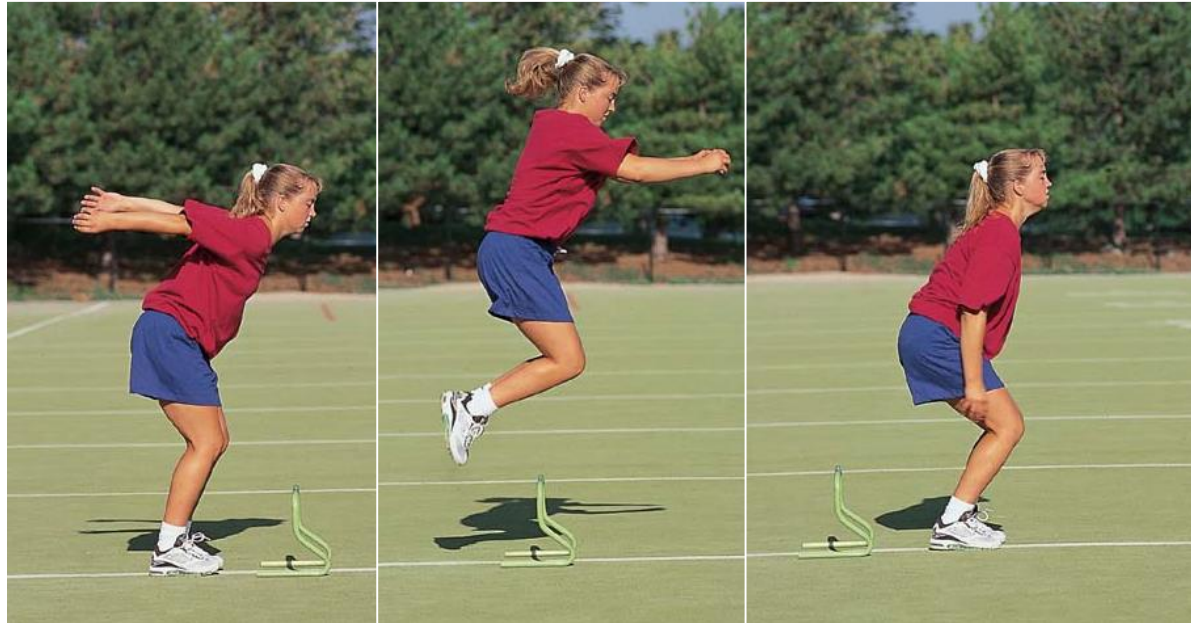
- Move rapidly from side to side (shuffle) without significant vertical displacement
  - Image shows excessive vertical movement for demo
- Bench Jumps: without touching the bench, jump from side to side





# Jumping over Barrier

- Hurdles
- Over bench with rotation in air



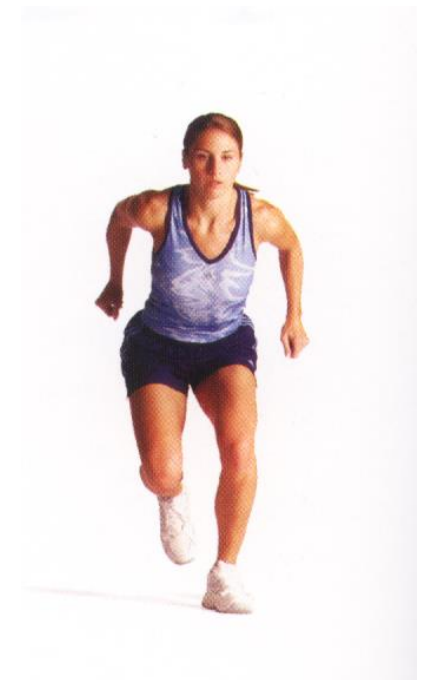
# Speed skaters Cone Touch

- Leaping side to side, touch cone with opposite hand



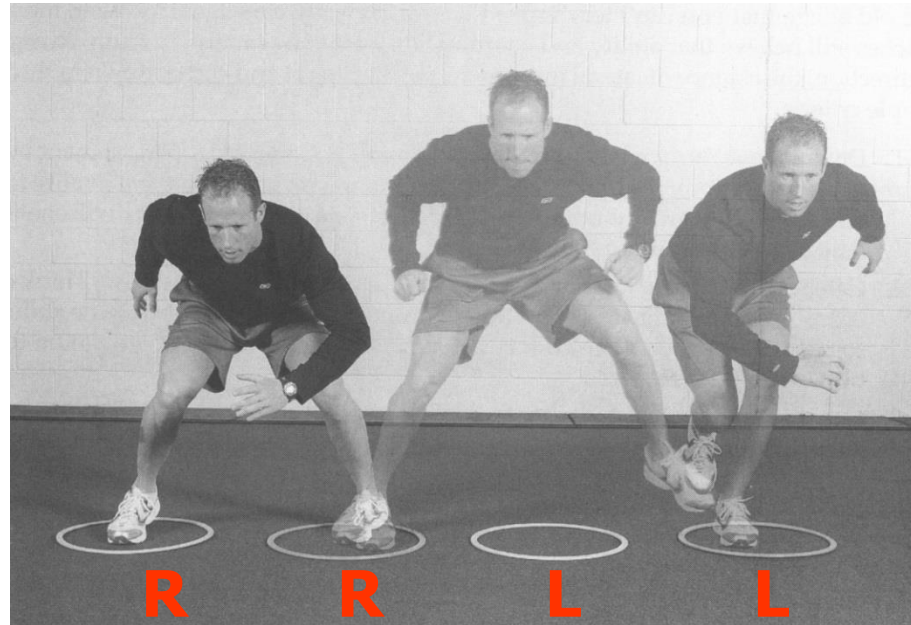
# Lateral Bound

- Explode out with the hips for maximum height, the idea is to jump as high and far as possible
- Hold for 2 seconds
- Progression: decrease contact time



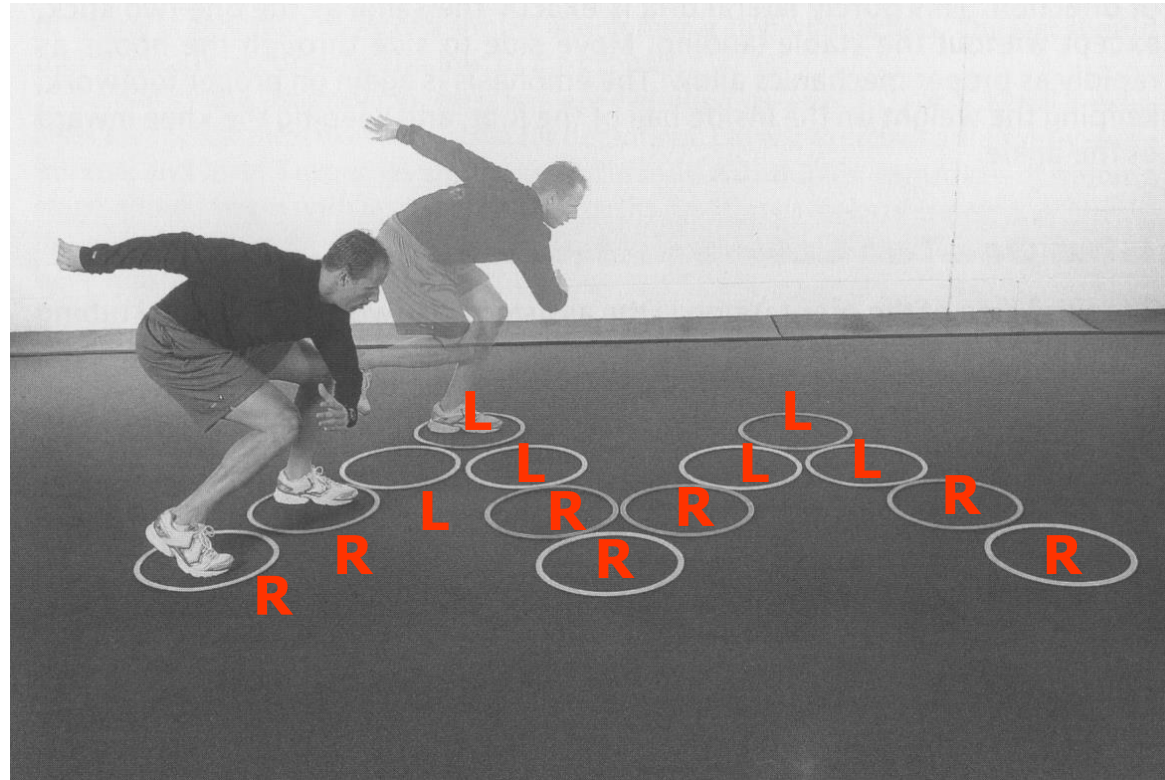
# One-Two Stick

- The initial and final position are held for 1-2 sec
- Keep the weight on the inside ball of the foot when changing directions.
- Progression: decrease contact time (aka One-Two Cut)



# Forty-Five Degree One-Two Cut

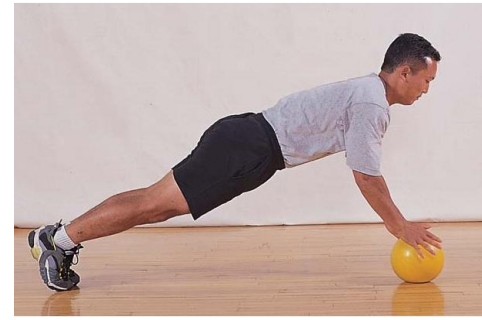
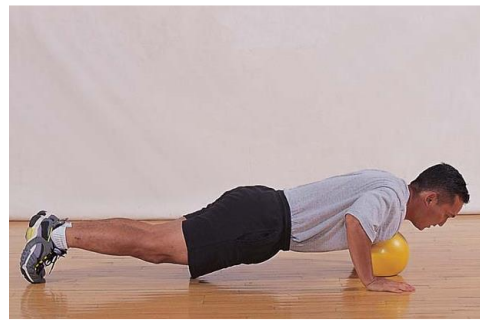
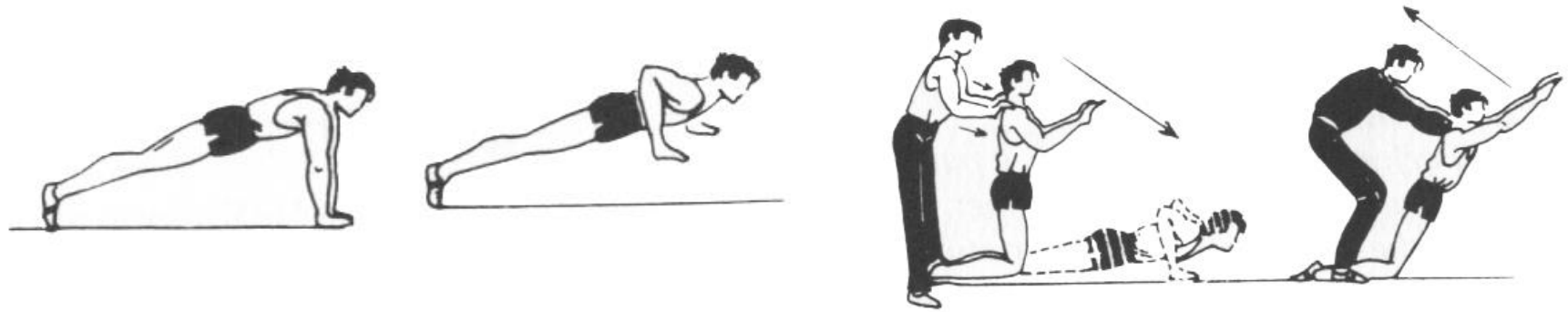
- Footwork same as one-two stick
- Lateral agility with a linear component





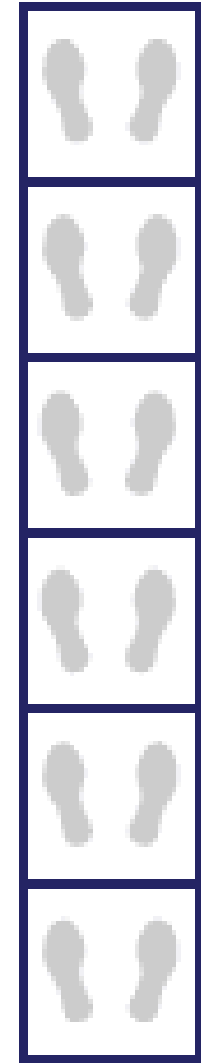
# Upper Body

- Push-ups
  - Hop, clap, depth, and drop variation
    - Vary incline to match fitness level
    - Advanced progression: feet on bench

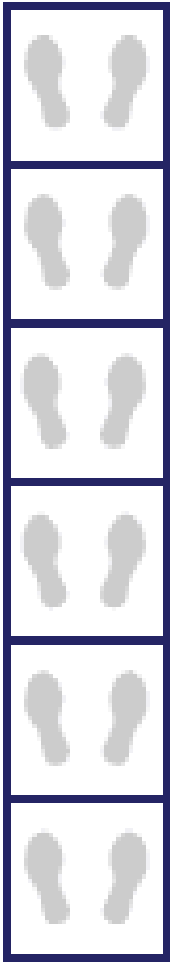


# Ladder Drills

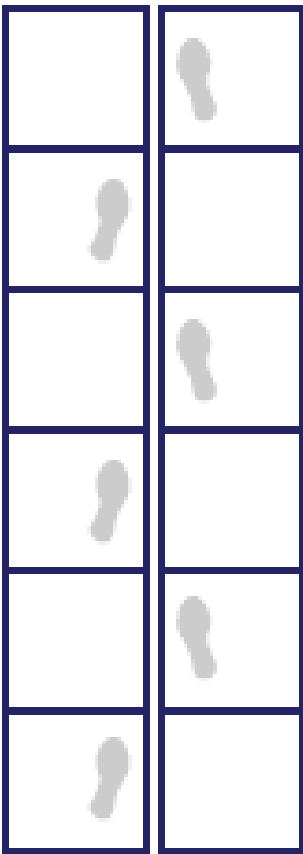
- All ladder drills should progress slowly in speed
- Idea is to maintain athletic stance and control at all times
- Questionable carry-over benefit into sports
  - Few sports require confined foot movement
- First drill: Double Foot Jumps →



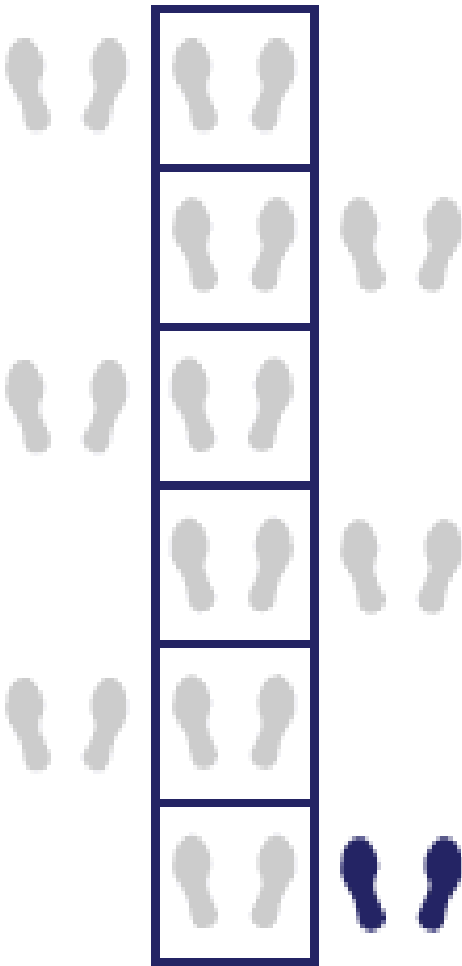
# Ladder Drills



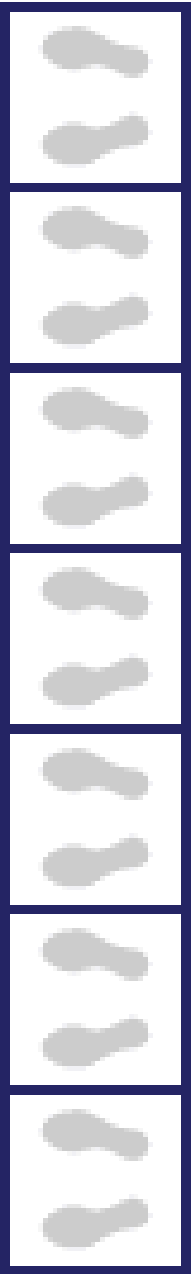
Quick Steps



Cross Step



Double Shuffle

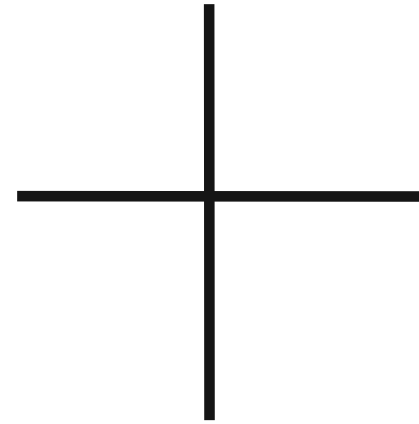


Side Step

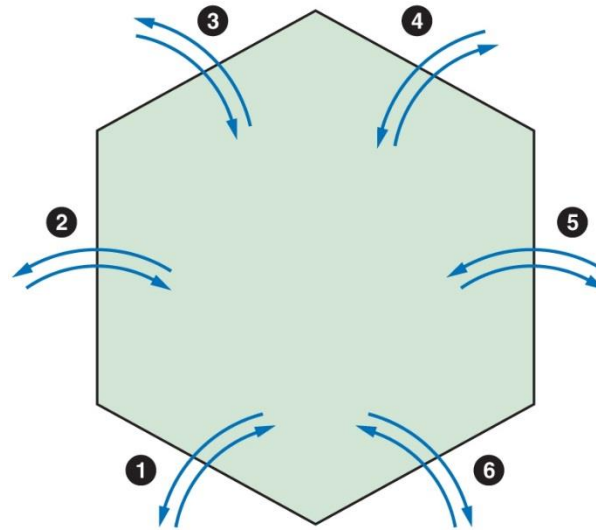


# Hopping Drills

- X-Drill
  - Multiple pattern options

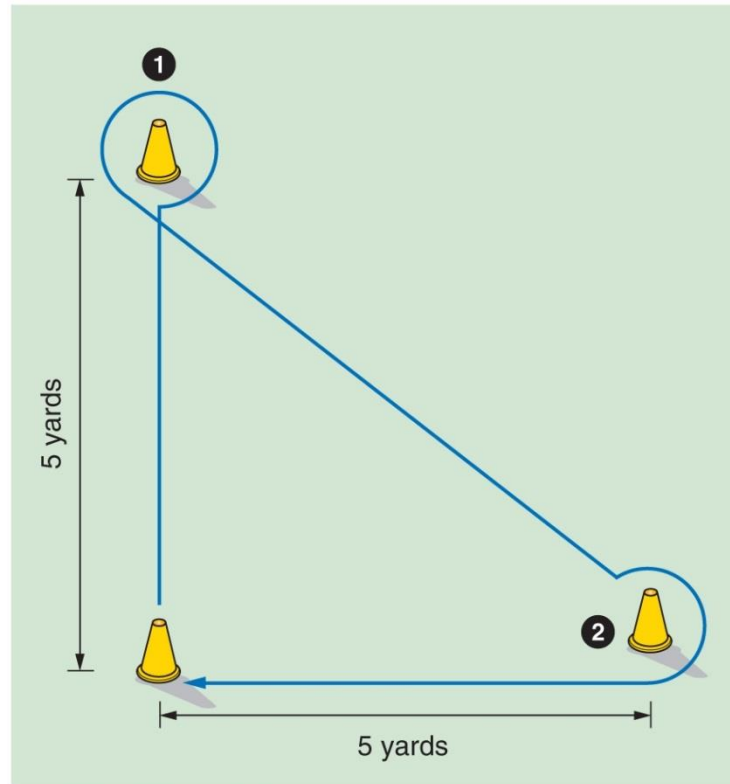


- Octagon Drill



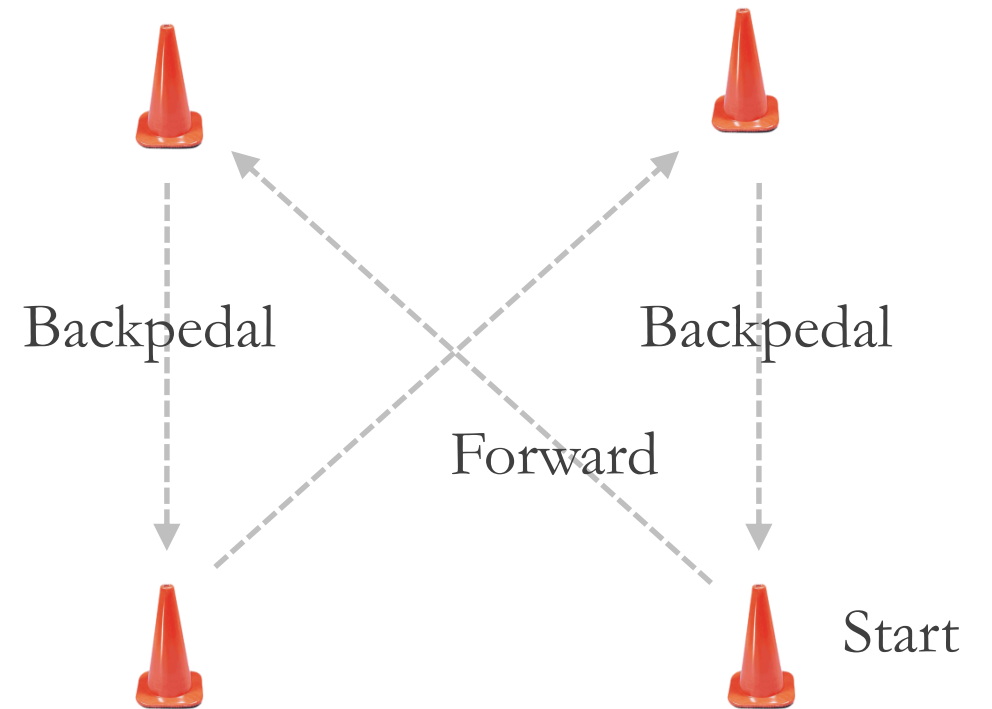
# Cone Drills

## Right Triangle



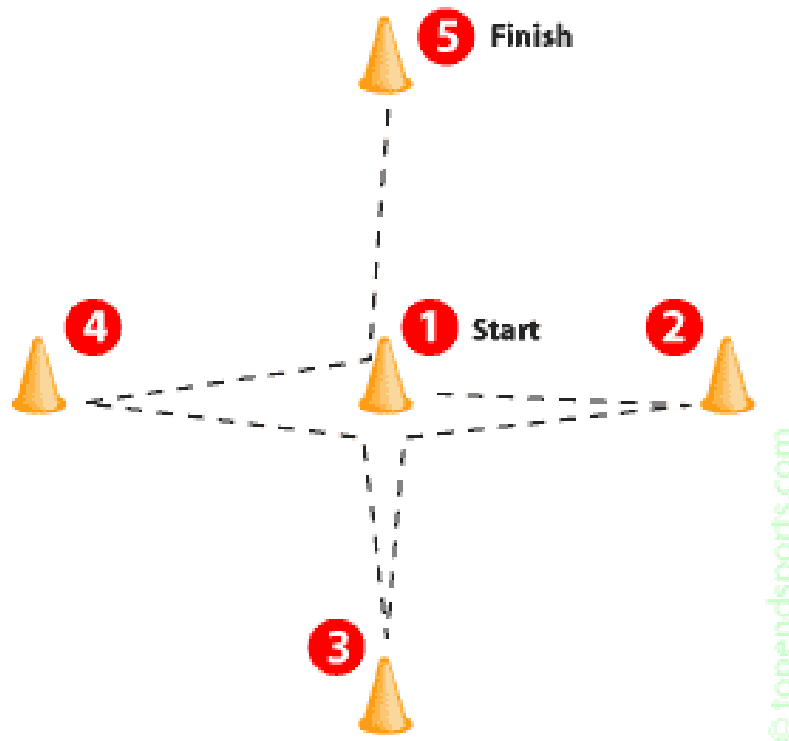
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## Hour Glass



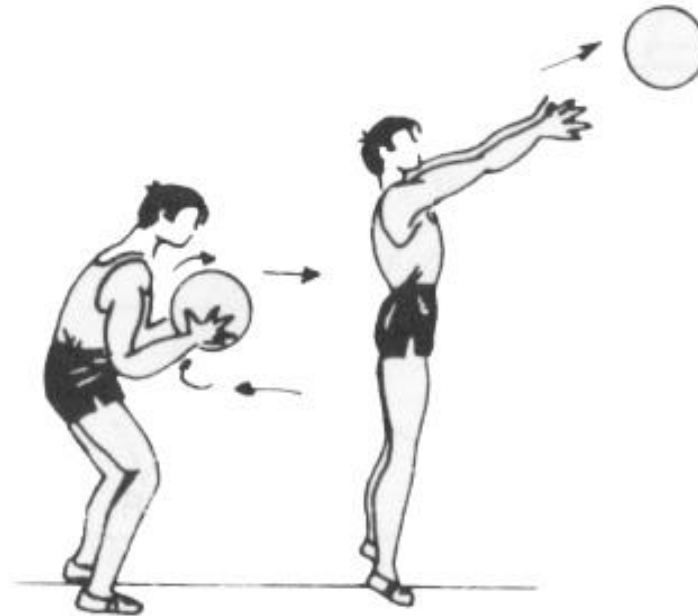
# Cone Drills

- Compass
  - Each cone must be touched with a hand
  - Distance from the centre is 3m but is variable



# Medicine Ball Drills

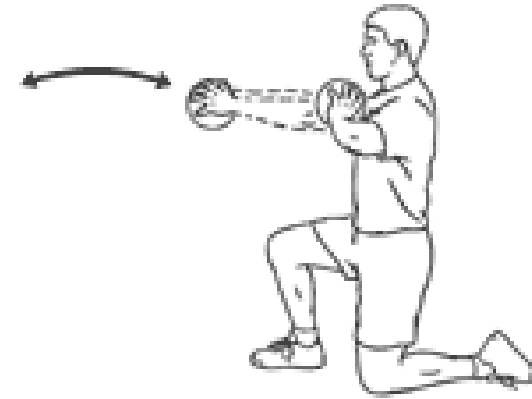
- Drills may be performed in a catch and throw manner with a partner
  - Catch: amortization time should be minimized
  - Throw: action performed as dynamically as possible
- If catching the ball is unsafe, only the concentric phase is targeted
  - Throwing against a wall



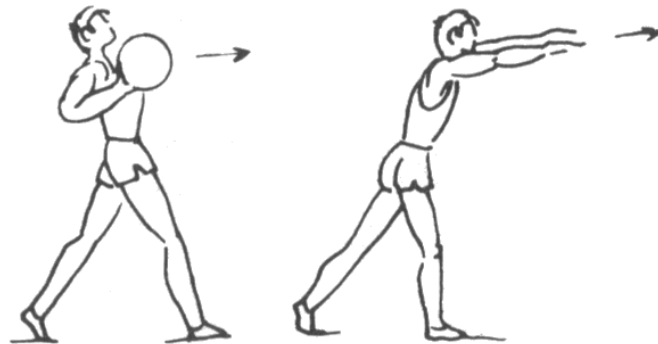
# Medicine Ball Drills – Push Progression



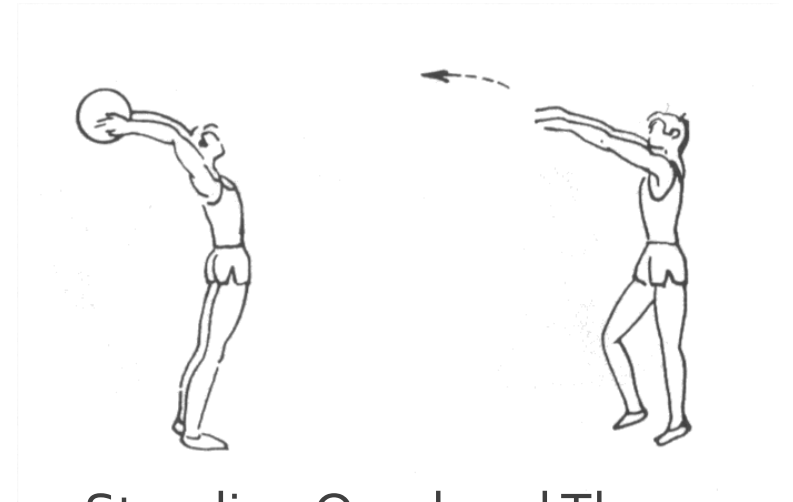
Kneeling Chest Throw



Half Kneeling Chest Throw

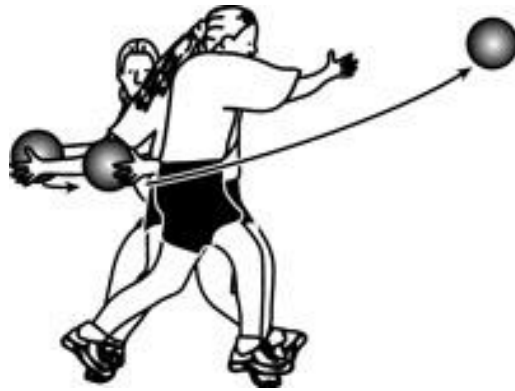


Standing Chest Throw



Standing Overhead Throw

# Medicine Ball Drills – Rotation



Turn and Throw

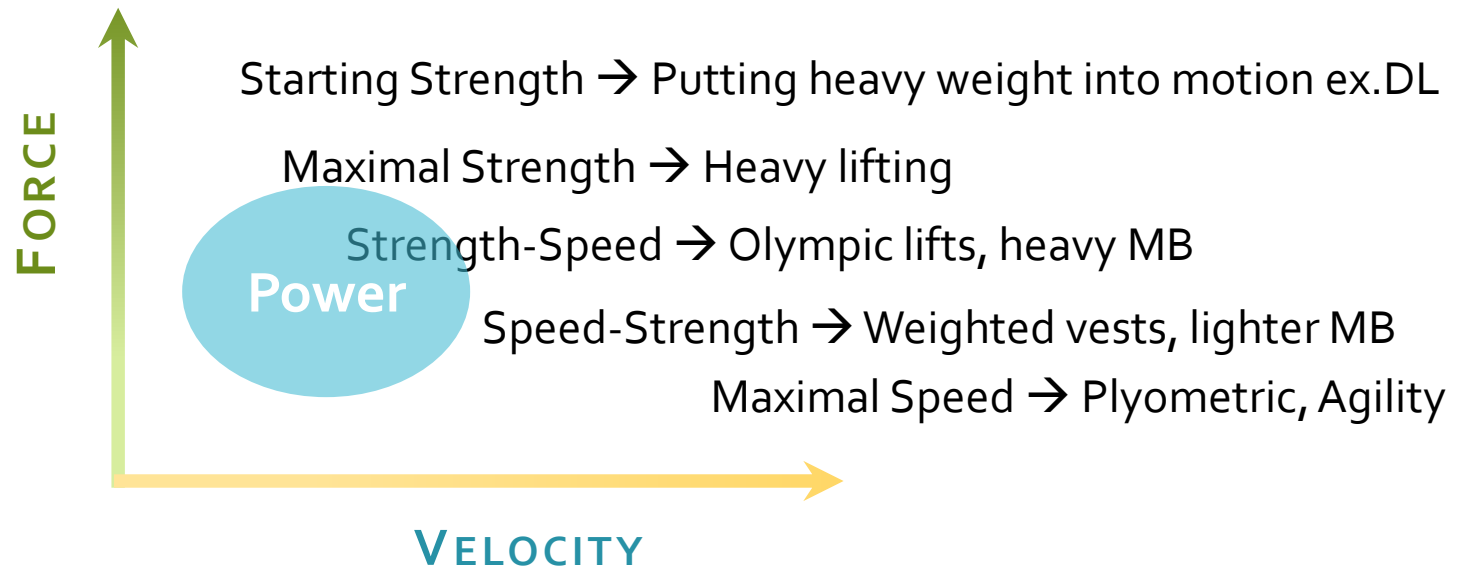


Overhead Slams



One-Arm Chest Throw

# Olympic Lifts



# Olympic Lift Clean & Jerk





# Olympic Lift Clean & Jerk



## Starting position

- Feet hip width apart
- Grip shoulder width (arms outside of knees)
- Bar close to shins
- Neutral spine posture (lower back maybe flat but not arched)
- Hold breath



## First Pull

- 'slow' movement
- Hips and shoulders should rise simultaneously
- Keep the back flat or slightly arched
- Keep bar as close to shins as possible
- Continue to hold breath

# Olympic Lift Clean & Jerk



## Transition ('Scoop')

- Thrust hips forward and slightly reflex the knees to move thighs against the bar
- As the knees re-bend, shift your weight towards the balls of the feet
- Back remains flat or slightly arched
- Elbows pointed outside



## Second Pull

- 'fast' movement, with the bar on the thighs between mid-thigh and knees, forcefully extend the lower extremities (jump!)
- The bar should pass as close to the torso as possible
- Elbows pointed outside
- The breath should still be held

# Olympic Lift Clean & Jerk



## Catch

- The bar should land on the anterior deltoid, not the clavicles
- Position is similar to a Front Squat with the torso fully erect
- Bend the lower extremities to absorb the bar
- Stand up and re-position the feet
- Breathe!



## Starting Position

- Re-position feet hip-width apart and the toes pointed forward
- Stand erect
- Take a deep breath just before the next phase



## Dip

- With torso erect and the head in a neutral position, flex the hips and the knees at a slow to moderate speed.
- The bar should move down in a straight path
- The dipping movement should only be ~6-8 in.

# Olympic Lift Clean & Jerk



## Upward Movement ('Drive')

- Ballistically reverse the movement by rapidly extending the hips, knees, and ankles.
- The feet may come off the floor during this movement.
- The neck must be slightly extended to allow the movement of the bar straight up



## Catch

- As the bar is caught directly overhead with fully extended elbows, the hips and knees should be flexed to about a quarter squat position.
- The torso should be erect with the head in a neutral position
- Body weight should be balanced over the middle of the foot.
- Keep holding the breath until the bar is stabilized.

# Clean & Jerk Variations



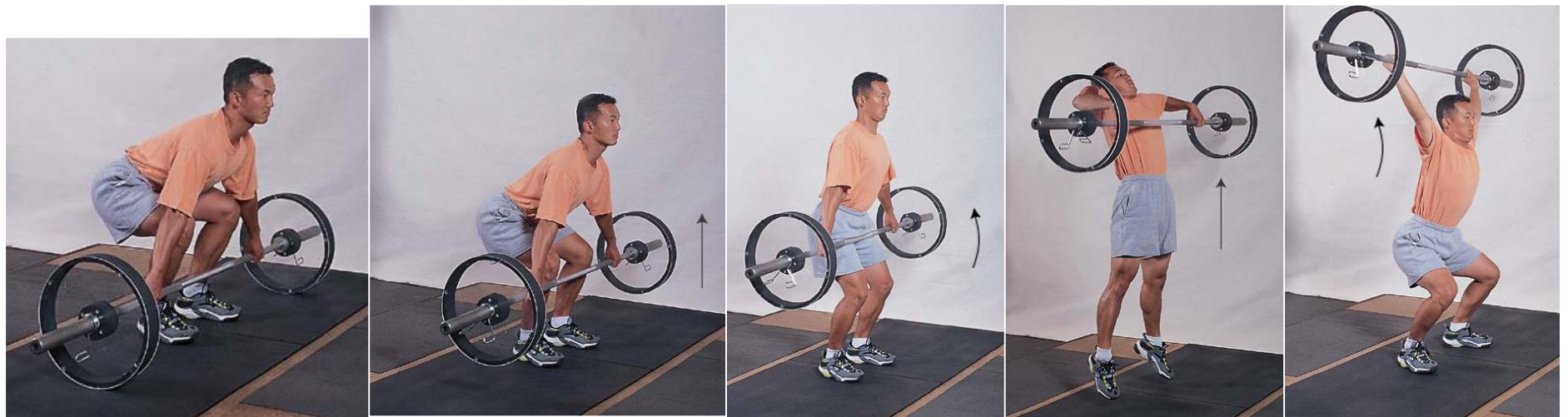
# C&J Learning Progression

- Low pulls
- High pulls
- Hang Clean
- 1st Pull and Transition
- Power Clean
- Push Jerk
- Full lift





# Olympic Lift Snatch



# Olympic Lift Snatch



## Starting Position

- Same as Clean but with greater lower body flexion and wider grip.
- Grip measurement: fist-to-opposite shoulder method or elbow to opposite elbow
- Hold breath



## First Pull

- 'slow' movement
- Hips and shoulders should rise simultaneously
- Keep the back flat or slightly arched
- Keep bar as close to shins as possible
- Continue to hold breath





# Olympic Lift Snatch



## Transition ('Scoop')

- Same as Clean however the bar will be placed slightly higher on the thigh due to the width of the grip.
- Hold breath



## Second Pull

- 'fast' movement
- Initiate a fast upward jumping motion
- The bar should be as close to the body as possible
- As the shoulders reach their highest elevation, flex the elbows to begin pulling the body under the bar
- The breath should still be held

# Snatch – Learning Progression

- Low pulls
- High pulls
- Hang Snatch
- 1st Pull and Transition
- Full lift

