SESSION 1: HIGH JUMP TECHNIQUE AND TECHNIQUE TRAINING

Matt Burns
Overview

• Physics Behind the High Jump
• Approach, Takeoff, and Bar Clearance
• Deciding What’s Important in a Jump (to change or not to change)
• Training/Practice
High Jump Physics

- Rotations are all created from the approach and takeoff. No rotations can be created after takeoff.
  - Twist
  - Somersault – Lateral and Forward
Positions In the Jump

1. **Takeoff Foot Plant**
   Takeoff foot and shoulders at 30° to 45° to bar.

2. **Takeoff**
   Shoulders rotated to 90° to bar and lead knee driven parallel or slightly away from bar to generate the needed twist rotation.
Positions In the Jump

3. **Layout**
Head/feet below bar. If executed ideally, the center of gravity will pass below the bar.

4. **Landing**
Shoulders should hit mat first with back facing takeoff spot.
**Approach**

**Goal:** Place the jumper in the same spot relative to the bar with the same body leans and at the same speed on every repetition.

- Establishing a starting mark – reverse-run the approach staying inside tape/cones placed at 12-13 feet out.
- 8 or 10 with 2 “momentum-generating” steps.
- Preservation of the mark – Write it down!
Foot-plant and Takeoff

- Vertically*
- Takeoff leg (plant leg) experiences very little flexion
- Lead leg driven parallel to or *slightly* away from the bar
- Arms driven parallel to or *slightly* away from the bar

*The queue to the jumper is to takeoff vertically, but in reality the takeoff is 10-20 degrees beyond vertical.
Approach Speed at Takeoff

- Regardless of whether a jumper is a “speed” or “power” flopper, a faster jumper is a higher jumper... up to a failure point. Find the failure point!

“Speed” jumper – trailing foot comes through high.

“Power” jumper – trailing foot comes through low. Possible toe-scrape.

Flight Phase & Bar Clearance

- **Goals**
  - Keep everything (arms, legs, hands, head) out of the way of the bar.
  - Keep everything close to the axis of rotation to speed up rotations.
  - “Let it happen.” Very little can be done at this stage to save a bad approach or takeoff.

- **Avoid queues during flight to correct approach problems**
  - Example: Don’t tell the jumper to “Throw your head back” to correct under-rotation issues.
Deciding What’s Important

- Primary Importance

• Consistent approach velocity and cadence.
• Maximized approach velocity.
• Proper and consistent takeoff location.
• Correct body-position (leans) at takeoff foot plant.
• Correct takeoff position (knee-up, shoulders at 90° to bar).
• Proper landing position (indicates correct rotations).
Deciding What’s Important - *Secondary Importance*

- Head position during layout
  - High bars can be cleared with your head up

Dick Fosbury

Dwight Stones - 1983
Deciding What’s Important
- Secondary Importance

• Arm Position during layout

There is considerable variance among the best jumpers in the world. Important thing is to keep the arms away from the bar.
Deciding What’s Important
- Secondary Importance

• Lead knee action during ascent – straight vs. bent. (straight legs slow rotation)
Deciding What’s Important

- *Not Important*

  • Arm drive technique – Athletes have succeeded with all three common varieties.
    • Double Arm
    • Single Arm
    • Cyclic

  It is important to have some consistent arm drive technique, but I have seen nothing proving one is better than any other.
Approach Training

- The execution of a consistent, correct approach is the single most important task in the event.
  - In competition, an approach that ends with a “go around” is unacceptable.
- Approach work must be the start of every practice that involves high jumping.

A practice approach is a full approach but instead of attempting a jump, the athlete pops up under the bar placed at a high (goal?) height.
Approach Training (Cont.)

• Approach work is not a warm-up for the jump workout. It should be watched and analyzed by the coach as much as any jumping is. Look for:
  • Good running technique.
  • Running along the curve – no cutting.
  • Accelerating into the takeoff foot-plant.
  • Consistency in takeoff foot position and coaching mark.
Approach Training (Cont.)

- Common mistakes during approach work
  - Failing to attack the curve (lazy, slow)
  - Failing to prepare properly (should be the same as if the athlete was jumping). Visualize a successful approach.
  - Popping up and landing on the ground in front of the bar instead of running under the bar.
Coaching Marks in Practice

- At the starting point, 8 or 10 steps from take-off. Ideally, the athlete will take a couple lead-in steps to this mark.

- Optional if needed:
  - 4 steps from the take-off – interim checkpoint for the athlete/coach. NOT a “cut” point.
  - Takeoff – 3-foot strip parallel to bar (practice only)

- Try to avoid overuse of any visual queue that can’t be used in a meet.
Technique Practice

• Know the goal of the practice and do the appropriate drills
  • Approach deficiency? Then just do approaches w/o jump or w/ scissor jump.
  • Takeoff position problems? Do short approach jumps.
  • Arm/Head positions or bar clearance issues? Do standing back-overs and/or short approach.
Technique Practice (Cont.)

• Back-Overs
  • Flight position practice (head, arms)
  • Over-exaggerate rotation - athlete should roll over their shoulders in the pit and end on their knees, facing the bar.
  • Negatives – make sure the athlete does not carry these over into the event:
    • Artificially produced rotations by throwing head and arms back and into pit.
    • Jumping into pit.
Technique Practice (Cont.)

- **Scissor Jumps**
  - Good for practicing a genuine full approach with out the pressure/stress of clearing a high bar with a layout.
  - Transitional drill to convert their full approach work into jumping event.
Technique Practice (Cont.)

• Short approach jumps
  • Short approach options
    • “Minnesota” 4-step (running into a 4-step)
    • True 4-step
    • 6-step varieties of above
  • Takeoff, flight, and layout practice
  • Benefits over full approach
    • Delays fatigue onset – more jumps in practice.
    • Reduces over-use injuries.
    • Reduces approach-introduced inconsistencies, so focus can be on takeoff/flight.
Technique Practice (Cont.)

• Full Approach Jumps
  • Transition what was learned with the short approach into a full speed jump.
  • Competition preparation.
  • Approach refinement.
  • Build confidence in actual event.
Technique Practice (Cont.)

• Common Rotational Problems
  • “Sitting” over the bar.
    • Insufficient somersault - Ensure no cutting on the approach. Ensure J radius is not too large. Ensure approach speed is maximized. Ensure proper leans away from the bar at foot-plant. Last resort is mega-doses of back-overs with the final roll to knees.
  • Body not at 90° to bar during layout.
    • Jumper is throwing head back into the pit.
    • Little to no backward lean when take-off foot is planted.
  • Hip closest to the bar at takeoff is lower than the other while clearing bar.
    • Increase twist rotation – Drive the lead knee up and to the bar height on a parallel-to-bar trajectory or drive the knee slightly more away from the bar.
HJ Practice – Common Mistakes

• Repetition of jumps simply for the sake of repetition. Every jump should have a purpose/focus, which is likely different per athlete.

• Jumping too many days/week. Maximum should be 3 days, including the meet.

• Avoid the desire to do a wide variety of drills. High jump is a “single skill” event. The drills consist of practicing subsets of that skill; Approach, takeoff, and layout.
Paralysis of Analysis

• When the athlete is given too many queues – complete failure.
• Per jump: 2 Queues is usually 1 too many.
• Per practice: Focus on one, maybe two, things per jumper per practice.
Video Analysis

- Important that athletes SEE themselves jump.
  - I have explained something to an athlete for weeks without success, only to have them say “Oh, now I see what your talking about” after showing them a 10 second video of themselves just once.
Where to Get More Information – *HJ Technique*

  - Good Overview/Starter
  - Available free at [http://www.coachr.org/rotation.htm](http://www.coachr.org/rotation.htm)
  - Available free online. Google the article title (path too lengthy).
  - Excellent book for an advanced athlete
High Jump Practice – First Day of Season

1) Full approach work. It gives them an idea of what the goal is and what the final jump will look like w/o the difficulty of actually jumping.

2) Full approach scissor jumps – very low bar.

3) Standing back-overs. Finishes the jump w/o the variability of the approach.

4) “Minnesota” 4-Step jumps (running into a 4-step mark)

5) Full approach jumps (This is usually for the athlete’s psychology only. Nothing can be gained from doing full approach jumps on day 1 of practice).
High Jump Practice – Subsequent Days

1. 10x full approaches – ALL HJ practices start with 10 good quality full approaches at a high bar with a light pop-up off the takeoff foot with the jumper going under the bar into the pit.

2. 5x back-overs – A back-over is only successful if the jumper lands on their upper back/shoulders and backward-rolls over to knees in the pit. This forces them to emphasize the rotation.

3. 4 step jumps or full approach – 4-step if working on takeoff or body positions in the air. The latter if working on approach speed or curve run or looking to gain confidence.