Theory and Training for the 400m Hurdles

Scott C. Roberts
Women’s Sprints/Hurdles/Jumps Coach
University of Alabama
Necessary Attributes

• Strength of an 800m runner
• Hurdling ability of the sprint hurdler
• Visual steering ability of the horizontal jumper

Successful competitors have come from the sprint, hurdle, jump and middle-distance ranks
400h Selection Criteria

- **Sprint Ability** - Speed is always the primary limiting factor in any speed & power event.

- **Aggressive Mental Attitude & Concentration** - Must be aggressive & be able to concentrate on negotiating the barriers.

- **Strength** - Both maximal strength & strength endurance are required.

- **Dynamic Mobility** - Mobility within the hips to efficiently perform the hurdling motion.
Performance Qualities

In Order of Importance

• **Ability To Apply Force @ Takeoff** - To move through the hurdle and minimize deceleration.

• **Ability To Hurdle With Both Legs** - To take the hurdle smoothly without slowing down.

• **Ability To Maintain Consistent Rhythm** - To have the special strength and technique to run over 10h with the least amount of breakdown.

• **Ability To Manage Race Distribution Efficiently** - To not run too fast and die or too slow and not be in the race.
Start and Approach to First Hurdle
Start and Approach to First Hurdle

• 22-25 steps to first hurdle (women)

• 20-23 steps to first hurdle (men)
Start and Approach to First Hurdle

• Attack the first 4-5 strides in the same way as in normal acceleration from blocks

• Should accelerate the last few strides into each hurdle (at least 10m away)
  – “Sprint 3 strides on and 3 strides off the hurdle”
  – The last stride prior to each hurdle should be shorter & quicker than the previous strides. (Cut Step)
Start and Approach to First Hurdle

• **Left-leg lead**
  – is preferred on the curve
  – allows athlete to run on the inside of the lane.
  – Keeps athlete from pulling the trail leg over the inside of the hurdle during clearance.

• **Right-leg lead**
  – Must allow for the trail leg to clear the hurdle w/out being off to the inside of the lane (which causes disqualification)
  – Must run towards the middle or outside of the lane to allow the trail leg to clear over the hurdle
Takeoff
Takeoff

- Must lead with the knee, NOT the foot
- Stay aggressive and sprint through the hurdle.
Takeoff

- **Active Landing** - will shorten the last stride which will prevent planting or breaking.

- **“Cut Step”** - will be about 1.9-2.0m from the hurdle.
Hurdle Clearance
Hurdle Clearance

• Lower hurdle height than the sprint hurdles requires less body lean over the hurdle

• Parabolic flight of the hurdler’s COM doesn’t deviate from normal sprinting action as much as high hurdler’s.
Hurdle Clearance

• 400m hurdler doesn’t need to be as aggressive in “snapping” lead leg back to the ground.

• Complete recovery of trail leg ensures an active landing of lead leg.
Racing

- Must have a good sense of pace.
- Must understand the race plan and stride pattern.
- Staggered start may make it difficult for runner to gauge position.
- Race pressures and sense of panic can disrupt the planned stride pattern.
Racing

**Pace Judgement** - 1st 1/2 of race run 2 seconds faster than 2nd 1/2.

Take split at hurdle 5 and add 1.8-2 seconds. This yields 200m time.

- Take the athlete’s best 200m and add 2.5” to it. This yields a target time for first 200m.
- Then take target time and add 3.0” for the finish time.
  - There should not be a difference between the 200’s larger than 5%.
  - The 4th hurdle is at 150m or 3/8 of the race. The touchdown time at this hurdle is a valuable indicator of the distribution of effort during the early stages of the race.
Racing

• **1st 4 Hurdles** - Can mark the takeoff for the first 4 hurdles (put down cones & tape mark--then just cones--eventually remove the mark completely.)

• There should be no deceleration over these hurdles-even even splits.
  
  – Differentials of .20 or greater constitute a problem. May need to change down or correct form problem. *(Example: 4.38-4.48 is ok. 4.38-4.58 is a problem.)*
# 400m Hurdle Split Chart

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<thead>
<tr>
<th>Time at Landing after 1st Hurdle</th>
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Racing

• Establish stride pattern as part of the race plan for the 400 hurdles.

• 13-17 steps taken between the hurdles.
  – Stronger athletes may take fewer steps
  – All normally take more steps between hurdles later in race
  – Plan suited for individual athlete (flexible)
Racing

Stride length

• 17 strides require 6’1”
• 16 strides require 6’6”
• 15 strides require 7’0”
• 14 strides require 7’6”
• 13 strides require 8’0”
• 12 strides require 8’9”

Use talcum powder or sand on the track to measure stride length.
Racing

Transitions- Hurdle 6-8 (generally speaking, is where the change downs occur.)

- **Single alternate** - *Example:* Left lead hurdler transitioning from 13 strides to 14 strides, requiring him to alternate legs for the duration of the race.

- **Dual Alternate** - *Example:* Hurdler leading with left leg & taking 13 strides between would take 14 strides & use a right lead leg, then 14 again to get back to preferred left lead leg, & then finish the race with 15 strides between, taking all remaining hurdles with his left lead leg.

- **Double Cut down** - Used by the inexperienced hurdler who is unable to hurdle with his/her alternate lead leg. *Example:* hurdler is taking 13 strides between hurdles & leading with his/her left lead leg then cuts down to 15 strides between.
Talaya Owens-2\textsuperscript{nd}-58.12

- Example of a right leg lead.
Teaching/Training Guidelines for the Hurdles

• Biomotor quality development is essential to improving hurdle performance.
  – speed related qualities
  – strength, power,
  – flexibility, and mobility
Teaching/Training Guidelines for the 400 Meter Hurdles

• The 400 hurdles pose unique demands.
  – Training will resemble 100 or 110 program
  – Training will resemble 400 or 800 meter program.

• Endurance abilities are important
  – BUT do not ignore the development of:
    • acceleration ability
    • absolute speed
    • power
Teaching/Training Guidelines for the 400 Meter Hurdles

• Split the race at each hurdle.
  – Touchdown times.
    • Diagnosis of problems and in performance prediction.
Teaching/Training Guidelines for the 400 Meter Hurdles

• Some training should be done over barriers, so that certain segments of the race are rehearsed.

• Additional hurdle work should be done to improve hurdle technique. BOTH LEGS
Progressions for the Approach to the First Hurdle

- Approaches from the Crouch Start
- Cheated Approaches (7 step drill)
- Stick Drill Approaches
- Approaches from Blocks
7 Stride Drill

• Hurdles are set so that the same stride length that is required to run 15-17 strides is used in seven or nine strides.

• Example:

<table>
<thead>
<tr>
<th>Distance between hurdles</th>
<th>Touchdown Distance</th>
<th># of strides used in the race</th>
</tr>
</thead>
<tbody>
<tr>
<td>35m</td>
<td>3m = 32</td>
<td>15 = 2.13 x</td>
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</tbody>
</table>

# of strides you want to use in practice
7 = 14.91 + Touchdown Distance
3m = 17.91m

Distance between hurdles in practice
17.91m
Progressions for Between-Hurdles Running

- Cheated Hurdling
- 10 Step Hurdling
- Alternate Lead Leg Hurdling
Progressions for the Hurdle Takeoff

• The Wall Drill
• Cheated Hurdling
• Alternate Lead Leg Hurdling
Progressions for the Hurdle Clearance

• Hurdle Walkovers
• Hurdle Skipovers
• Cheated Hurdling
• 5 Step Hurdling with each leg
• Alternate Lead Leg (4 Step) Hurdling