Hurdling 101
Short Hurdles

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The Beginning

- Block Set Up
- “On Your Marks”
- “Set”
- “Bang”
- Acceleration
Which Foot Goes in Front Block?

• Better question is:
  – Which foot goes in the back block?
Block Set Up

• Approximately 2 feet from the starting line for the front block.
• Approximately 3 steps from the starting line for the back block.
• Front block at 45 degrees (water hose)
• Back block at 55 degrees
“On Your Marks”

back block 3+ foot lengths behind line so that
back knee is 4+ inches in front of front toe
back thigh is perpendicular to ground
back toe is just touching the ground
back block at 55 degrees

front block 2 foot lengths from line so that
front knee splits mid line of arm
front shin parallel to ground
front toe has 1+ inch on track for dorsiflexion
front block set 45 degrees

back slightly rounded

head in natural alignment with spine

comfortable position with weight evenly distributed
between 2 hands, back knee and front hip
balanced from front to back and from left to right

hands in bridge
shoulders directly over hands
“Set”

Hips significantly higher than shoulders. “Seesaw”
Knee angles of approximately 90 and 135 degrees.
Weaker athletes need higher hips and larger knee angles.
Shins are parallel to one another.
Front shin is about 45 degrees angle with ground.

Place the back foot on the back block
by lightly pressing the heel and putting
achilles on stretch.(This picture does not
show full footed pressure).

Back slightly rounded.

Head remains in natural alignment
with spine. Focus of eyes shift back
as body rises to set.

Front foot and shin form a 90 degree angle.
Raise simultaneously and in harmony with hips and both knees in unison. There may be a SLIGHT displacement forward. Allowing the centre of mass to be as high as possible. Weight remains evenly distributed. No additional weight left on hands from the “on your marks” position. You may feel the weight shift from middle finger to index finger. Bulk of weight felt on front hip, not the hands. This is achieved by placing your feet on the blocks as you come up to set rather than pressing your feet into the blocks (this causes a push forward). Weight is distributed between 2 hands and front hip. If one is balance, this position can be held for a considerable amount of time.
Hip Height
Too Much Forward Lean?
The back arm (left in this case) will sweep long and low at
the gun corresponding to the long force application on the
front block. The arms stroke from the shoulders. The back
arm will open significantly at the elbow. The front arm will
stroke forward and up with the hand high and well in front of
head. This longer arm action will allow time for hip to extend
forcefully and completely.

You will see the back foot move backwards on
block quickly, eliciting a stretch shortening
across achilles. There should be no effort to
pull the back foot off the block. It will come
forward naturally in reaction to the long
forceful application on the front block. The
path of the foot will be low and piston like.
It will not cycle forward to the butt.

Head and shoulders WILL come up quite a bit, creating a
line of power from ankle through the knee, hip, torso and
head. Head remains in natural alignment. Line of sight
changes as body angle changes.

acute thigh to chest angle for
subsequent force application
At the gun the athlete will drive the front foot on the front block extending at the hip, knee, and eventually the ankle (triple extension). Relatively equal horizontal and vertical force will be in use to project the body at a 45-degree angle. The arms will stroke violently. There should be NO ATTEMPT to be quick here. There needs to be long and complete force application. While this may “feel slow” to the athlete, the body will actually be moving toward the finish line faster. The athlete must “re-set their hasty timing to a new sense of time and get accustomed to spending longer in that movement”. This new feeling allows the body to get into the best positions for continued acceleration even further down the track.

***ROM Drill
Retrain the Brain

• The athlete may feel slow, but they are putting their body into the right position to continue to drive/push.

• They may feel slow, but they are moving faster through space evidenced by the drill we just did.

• The pushing will allow them to continue to accelerate down the track (not just stand up and run).

• The greatest teacher of all time once said, “You must unlearn everything that you have learned.”
Flight of the Back Foot

• The path of the back foot should be low and piston like.
• Foot back foot should travel forward through the front /opposite ankle (skate)
• After the back foot “skates” through the opposite ankle it will continue forward causing the knee to form a “hard Z” position.
• The back foot should not cycle toward the butt.
Banana Hurdle Start
Prerequisites to Block Work

• These drills need to be mastered before having athletes come out of blocks.
  * Wall Drill
  * Push Up Start
  * Rollover-Push Up Start
  * Skate Start
  * Hop-hop-split-skate Start
  * Donkey Kick Start
  * 3 Point Start
  * 4 Point Start
  * Stick Drills Without Blocks
  * Explosive Medicine Ball Throws

• Using blocks is a reward, not a gift.
Stick Drill Without Blocks
Block Work

- Block Blast on PV wedge (0,1,2 steps)
- Block Blasts with Resistance (Bullet Belt)
- Block Bounds
- Stick Drill Out of Blocks
Block Blasts on PV Wedge
Block Blasts with Resistance (Bullet Belt)
Stick Drill Out of Blocks
• The amount of time on the ground is significantly greater and their time in the air is shorter during this process than later in the race. (feels slow)
• The ratio changes through acceleration and transition to maximum velocity as ground contacts shorten and air time increases.
• The body angle will increase 5 to 10 degrees with each step, therefore so should the shin angle at the point of contact.
• The body remains in a power line from ankle, through the knee, hip, torso, and head. (POGO Stick) The hip axis climbs with each step.
• Avoid collapsing at the ankle, knee, or hip.
• Stable strike on the ball of your foot under or even behind the center of mass.
• Full strides down and back allowing the hip and knee to extend.
• Arm strokes remain full in a downward and backward direction, the elbow straightens and reflexes on the backside.
• There is absolutely nothing quick or small about acceleration.
• “Run on your feet but with your hands”.
• Cue power, not quickness.
• It requires patience to push violently.
• Each push becomes a little less horizontal and a little more vertical.
• Correct extension into and off the track with one leg will yield effective reactionary recovery of the opposite leg.
Acceleration Drills

- Acceleration Drills With Build Ups
  - Straight leg bound
- Acceleration Drills With Bullet Belt
  - Walk, March, and Run & Release
- Light Sled Pulls
- Various Starts w/ Weighted Vest
- Short Hills
- Short Stick Drills (next slide)
Acceleration to the First Hurdle

**Women**
- .60m
- 1.70m
- 3.05m
- 4.55m
- 5.95m
- 7.60m
- 9.35m
- 11.05m
- First Hurdle

**Men**
- .60m
- 1.70m
- 3.05m
- 4.55m
- 6.20m
- 8.00m
- 9.90m
- 11.70m
- First Hurdle
Take Off Mechanics

• “Lead with the Knee”
  – Don’t lead with the foot.

• “Watch to Wallet”
  – Lead arm thumb turned down and to the forehead or above for men.
  – Lead arm thumb turned down and to the mouth or above for women.

• “Stay Square”
“Cut Step”

• Practice this without a hurdle.
• As the athlete progresses start to add a banana hurdle, then a power hurdle, then a low hurdle, then a hurdle at race height.
Flight Mechanics

• “Stay tight”
• “Hurdle through the window”
• Knee should be bent, not straight.
• “Chest over thigh”
• “Toe down...go down”
  – Evert the toe to ensure clearance of the hurdle and put foot into better position to run off the hurdle.
Coming Off the Hurdle

• “Active lead leg”
  – As soon as the front foot crossed the hurdle it should move toward the ground.
  – The back arm waits at the hip and races the lead leg through the hurdle.
• “Sweep the arm back”
  – The trail leg will be tight to the body moving into the arm pit.
  – The arm needs to sweep back accordingly to make room for the trail leg.
  – Do not swing wide!!
• “Push your shoulders up”
  – Don’t stand up too early.
  – Wait until the trail leg goes through the hurdle.
Flight Mechanics
Coming Off the Hurdle
Hurdling Drills without Hurdles

• Walk it
• Stride it
• Staircase it
  – Use a staircase to reinforce the various sections of hurdling.
Can you hear my foot steps?

- Hear the rhythm of the take off and landing.
- Lead leg and trail leg take off close together and land close together in sound.
# Take Off & Landing Distances

<table>
<thead>
<tr>
<th>Men’s Height</th>
<th>Take Off</th>
<th>Landing</th>
<th>Women’s Height</th>
<th>Take Off</th>
<th>Landing</th>
</tr>
</thead>
<tbody>
<tr>
<td>5’3”</td>
<td>7’5”-7’9”</td>
<td>2’9”-3’3”</td>
<td>5’3”</td>
<td>6’5”-6’9”</td>
<td>2’9”-3’3”</td>
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<tr>
<td>5’5”</td>
<td>7’4”-7’8”</td>
<td>3’0”-3’3”</td>
<td>5’5”</td>
<td>6’4”-6’8”</td>
<td>3’0”-3’6”</td>
</tr>
<tr>
<td>5’7”</td>
<td>7’3”-7’7”</td>
<td>3’3”-3’9”</td>
<td>5’7”</td>
<td>6’3”-6’7”</td>
<td>3’3”-3’9”</td>
</tr>
<tr>
<td>5’9”</td>
<td>7’2”-7’6”</td>
<td>3’6”-4’3”</td>
<td>5’9”</td>
<td>6’2”-6’6”</td>
<td>3’6”-4’3”</td>
</tr>
<tr>
<td>5’11”</td>
<td>7’1”-7’5”</td>
<td>3’9”-4’9”</td>
<td>5’11”</td>
<td>6’0”-6’5”</td>
<td>3’9”-4’5”</td>
</tr>
<tr>
<td>6’1”</td>
<td>7’0”-7’4”</td>
<td>4’0”-4’10”</td>
<td>6’1”</td>
<td>5’10”-6’3”</td>
<td>4’0”-4’6”</td>
</tr>
<tr>
<td>6’3”</td>
<td>6’11”-7’3”</td>
<td>4’3”-5’0”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6’5”</td>
<td>6’10”-7’2”</td>
<td>4’6”-5’3”</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Get-Away Stride

• KEEP RUNNING!!!

• No Bounding

• After the first hurdle the athlete’s eyes should be up looking at the next hurdle.
## Between the Hurdles

### Feel the Rhythm

<table>
<thead>
<tr>
<th>Goal Time</th>
<th>1st Hurdle</th>
<th>Rhythm Between</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>2.6 seconds</td>
<td>1.2 seconds</td>
</tr>
<tr>
<td>14</td>
<td>2.5 seconds</td>
<td>1.1 seconds</td>
</tr>
<tr>
<td>13</td>
<td>2.4 seconds</td>
<td>1.0 seconds</td>
</tr>
</tbody>
</table>
# Hurdle Facts

<table>
<thead>
<tr>
<th></th>
<th>Height of Hurdle</th>
<th>Distance from Start to H1</th>
<th>Distance Between Hurdles</th>
<th>Last Hurdle to Finish Line</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td>39”</td>
<td>13.72m</td>
<td>9.14m</td>
<td>14.02m</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>33”</td>
<td>13m</td>
<td>8.5m</td>
<td>10.5m</td>
</tr>
</tbody>
</table>
Discount Hurdle Philosophy

• Train with hurdles closer and lower than normal to attain desired rhythms.
Train Both Legs

• Athletes need to be symmetrical to decrease their chances of injury.
• Train both legs to lead.
• Athlete should be able to hurdle with opposite leg within 1 second with preferred lead leg.
# Common Errors in Hurdling

<table>
<thead>
<tr>
<th>The Approach</th>
<th>Too high over hurdle</th>
<th>Over-striding to hurdle putting the athlete too close. Cut step?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take Off</td>
<td>No forward lean</td>
<td>Not attacking with the knee. Probably leading with their foot.</td>
</tr>
<tr>
<td>Clearance</td>
<td>Hitting the hurdle with the trail foot.</td>
<td>Foot is not inverted.</td>
</tr>
<tr>
<td>Landing</td>
<td>Off balance</td>
<td>Twisting over the hurdle or jerking trail arm back rather than sweeping.</td>
</tr>
</tbody>
</table>
Dipping at the Line

- Pet peeves

Charlie Paddock
Hurdle Warm Up

1. 400m Continuous Motion Skips
2. 400m of forward and backward jogging
3. 30m Pivot Squats
4. 30m Forward 1-Legged Toe Touches
5. 30m Backward 1-Legged Toe Touches
6. 60m Straight Leg Bounds
7. 60m Marching Runs
8. Iron Cross
9. Scorpions
10. Hurdle Seat Exchange
11. Hurdle Seat Rollover
12. Wall Drills
   - Penetration Drill
   - Trail Leg Drill
   - Train Leg Drill with Slant
13. 5 Step Hurdle Tops (bent leg)
14. Alt. Hurdle Tops (bent leg)
15. 3m 1 Step Bent Leg Ground Reaction (both legs)
16. 5m - 3 Step shuffle Hurdles (both legs)
17. 10m - 4 Step Drill (400m Hurdlers Only)
18. Stick Drill to H1
19. Stick Drill to H2 (take off marks)
20. Stick Drill to H3 (take off marks)
Vocabulary

• Acceleration
• Maximum Velocity
• Speed Endurance
• Extensive Tempo
• Intensive Tempo
• Special Endurance I
• Special Endurance II
Vocabulary

• **Acceleration:**
  – Always done at 100% intensity
  – Length of run are 10-30m
  – Total volume ranges from 180-360m
  – 2-6’ recovery (3’ for ATP to fully restore)
  – Examples include:
    • Light Sled Pulls with various starting techniques (up to 30m)
    • Short Hill Work (up to 30m)
    • Longer Stick Drills (up to 30m)
    • Block 10-30m runs
    • Combination Workouts
      – 4 x 4 x 30m 2-3’ btw reps and 5’ btw sets
        » even sets with light tire
        » odd sets with no resistance
Vocabulary

• Maximum Velocity:
  – Always at a 100% intensity
  – Length of runs of 40-150m
  – 120-450m of total volume
  – Examples include:
    • Assisted runs (pulley or bungee)
    • Light downhill running
    • Fly Work (10, 20, 30, etc...)
    • In and Outs
Vocabulary

• Speed Endurance:
  – Once the athlete has improved their maximum velocity and can produce this new max v consistently, you can begin the speed endurance phase.
  – 2 types of Speed Endurance
    • Short Speed Endurance
    • Long Speed Endurance
Short Speed Endurance

- Greater emphasis on speed
- Used to bridge capacity and power while maintaining technique
- Submaximal runs with controlled recoveries
- Length of runs are 30-80m (around race distance)
- Example:
  - 4x4x60m @ 90-95% w/ 2-3’ rec. btw reps and 6-8’ btw sets
Vocabulary Cont...

- **Long Speed Endurance**
  - Lactacid power and capacity
  - 90-95%
  - 3-8’ recovery
  - Length of runs are 80-220m (longer than race distance)
  - 300-900m of total volume
  - Example:
    - 4-6 x 120m at 90-95% with 3-6’ recovery
Vocabulary

• Extensive Tempo:
  – Aerobic Capacity
  – 70-79% of P.R.
  – 15”-3’ recovery
  – Length of runs greater than 100m
  – 1200-1800m in total volume
  – Examples include:
    • 6-10 x 200m @ 70-79% with 2-3’ recovery
    • 4 x 4 x 100m @ 75% with 1’ rec btw reps and 3’ btw sets (16x100m=1600m)
Vocabulary

• **Intensive Tempo:**
  – Lactacid Capacity (mixture of aerobic & anaerobic)
  – 80-89% of P.R.
  – 30”-6’ recovery
  – Length of runs greater than 80m
  – 800-1800m of total volume
  – Examples include:
    • 6-10 x 150m @ 80-89% with 2-4’ recovery
    • 4 x 250m @ 80-85% with 2-3’ recovery
Vocabulary

• **Special Endurance I:**
  – Lactacid Power
  – 90-98% of P.R.
  – 8’ or more for recovery
  – Length of runs are 80-300m
  – 300-1000m of total volume
  – Examples include:
    • 60, 90, 120, 150m at 95% with 8-10’ recovery
    • 4 x 120-200m at 90-95% with 10-12’ recovery
Vocabulary

• Special Endurance II:
  – Lactacid Tolerance
  – 95-100% of P.R.
  – Full recovery
  – Length of runs are 60-300m
  – 180-900m of total volume
  – Examples include:
    • 3 x 150m @ 100% with full recovery
    • 2-3 x Fly 100m Runs with full recovery (confidence builder)
Triangle Training Method

Speed Triangle

Tempo Triangle
Triangle Training Method

Extensive Tempo

Intensive Tempo

Special Endurance I

Special Endurance II
Triangle Training Method

Speed Triangle

- Speed Endurance, Max V, & Acceleration
- Max V & Acceleration
- Acceleration
Special Endurance I & II are the main focus

Acceleration and Extensive Tempo

Acceleration, Max V, and Speed Endurance

Acceleration, Max V, and Intensive tempo

Beginning of the season
Triangle Training Method

• Each section prepares you for the next section
• Each section builds your work capacity.
  – Work Capacity
    • Defined as capacity at high intensity plus reasonable volume, NOT high volume with low intensity.
• Each section better prepares you for race distances at the highest possible speeds.
Training Within A Micro Cycle

• Each day of the week has a theme
• Try to stay with that theme throughout the day
• Micro cycle without a meet (early season)
  – Monday – Acceleration
  – Tuesday – Tempo
  – Wednesday – General + Hurdle Drills
  – Thursday – Max Velocity
  – Friday – Tempo
  – Saturday – General + Hurdle Drills
  – Sunday – Rest or Restoration
Training Within A Micro Cycle

• Micro cycle with a track meet (mid-season)
  – Monday – Acceleration/Max Velocity w/ Hurdles
  – Tuesday – Tempo or Speed Endurance
  – Wednesday – General
  – Thursday – Speed Endurance w/ Hurdles
  – Friday – Pre Meet Ritual w/ Hurdle Acceleration
  – Saturday – Track & Field Meet
  – Sunday – Rest or Restoration
Hurdle Acceleration Workouts

• Hurdles 1, 2, 3
• Spice things up a bit!!!
  – Cardi Drill
    • Use technique from the one step drill
    • Hurdle spacing
    • Full speed out of blocks
    • Make sure you follow the proper progression before trying this workout.
Tempo Hurdle Workout

• Spice things up even more!!!
  – 3 step with cheat the spacing (see graph)
  – 5 step with extra room (see graph)
  – Hurdle with various spacing between the hurdles
    • 3 step, 5 steps, 5 step, 5 step
    • 3 step, 5 step, 3 step, 5 step
    • 3 step, 3 step, 5 step, 5 step
    • 3 step, 3 step, 3 step, 5 step
    • 3 step, 3 step, 3 step, 5 step
## Various Steps and Distances

<table>
<thead>
<tr>
<th>Rhythm</th>
<th>Boys</th>
<th>Girls</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 steps</td>
<td>8.3-8.5m</td>
<td>7.80-8.0m</td>
<td>8.5-8.8m</td>
<td>8.0-8.3m</td>
</tr>
<tr>
<td>5 steps</td>
<td>12.5</td>
<td>11m</td>
<td>13m</td>
<td>11.5m</td>
</tr>
</tbody>
</table>
Training Within A Micro Cycle

- Micro Cycle with a track meet (late season)
  - Monday - Special Endurance I or II w/ hurdles
  - Tuesday – General w/ Hurdle Drills
  - Wednesday - OFF
  - Thursday- Acceleration w/ Hurdles
  - Friday – Pre Meet Ritual w/ Hurdle Drills
  - Saturday - Track & Field Meet
  - Sunday – Rest or Restoration
<table>
<thead>
<tr>
<th></th>
<th>To Hurdle 1</th>
<th>Hurdle 2</th>
<th>Hurdle 3</th>
<th>Hurdle 4</th>
<th>Hurdle 5</th>
<th>Hurdle 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Girls Up</strong></td>
<td>33” Height 11.5-12.5m</td>
<td>33” Height 8.3m</td>
<td>33” Height 8.3m</td>
<td>33” Height 8.3m</td>
<td>33” Height 8.3m</td>
<td>30” Height 8.3m</td>
</tr>
<tr>
<td><strong>Girls Back</strong></td>
<td>30” Height 11.5m</td>
<td>30” Height 8.0m</td>
<td>27” Height 8.0m</td>
<td>27” Height 7.8m</td>
<td>24” Height 7.8m</td>
<td>24” Height 7.8m</td>
</tr>
<tr>
<td><strong>Boys Up</strong></td>
<td>39” Height 12.5-13.5m</td>
<td>39” Height 8.5m</td>
<td>39” Height 8.5m</td>
<td>39” Height 8.5m</td>
<td>39” Height 8.5m</td>
<td>39” Height 8.5m</td>
</tr>
<tr>
<td><strong>Boys Back</strong></td>
<td>39” Height 12.5m</td>
<td>39” Height 8.3m</td>
<td>39” Height 8.3m</td>
<td>36” Height 8.0m</td>
<td>36” Height 8.0m</td>
<td>36” Height 8.0m</td>
</tr>
</tbody>
</table>
Training Micro Cycle

• What do you do if you have more than one track meet during a week?
Training Within A Micro Cycle

• Things to use during any given session:
  – Specific Warm Ups
  – Technique
  – Running Workouts
  – Multi Jumps
  – Multi Throws
  – Strength Training
  – Static Flexibility
Training Within A Micro Cycle

• Not only does each day have a theme, but each week should have a theme.

• Examples include:
  – Speed/Technique
  – Strength
  – Work Capacity
  – Restoration

• Another example includes:
  – Week 1 Medium
  – Week 2 Hard
  – Week 3 Medium
  – Week 4 Easy
Identifying Hurdlers

• Coachable Athletes
• Good Leg Speed
• Tunnel Vision
• Aggressive out of the Blocks
• Coordination
• Flexibility
Recap

• Just remember:
  – We are trying to build rockets, but it is not rocket science.
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