



The short hurdle races (100m Hurdles for Women and 110m Hurdles for men) are a rhythmic sprint over 10 equally spaced barriers that require speed, power and technical efficiency. The women's 100m Hurdle race consists of 10 hurdles set at 33" in height. The distance to the first hurdle is 13m and the distance between 8.5m, with a run-in after the last hurdle of 10.5m. The men's 110m Hurdles consists of 10 hurdles set at 42" and the distance to the first hurdle is 13.72m (45 feet). The distance between hurdles is 9.14m (30 feet), with the run-in distance 14.02m.

This article will attempt to provide coaches with a concise, practical, user-friendly guide to training at a higher level and ultimately performing better in the sprint hurdles. Our goal is to present the technical aspects and necessary training in a comprehensive, yet practical application that all coaches and athletes can employ to improve their performances.

HURDLING 101

COACHING THE SPRINT HURDLES

Start and Approach to the first hurdle

- A smooth, explosive start and maximum acceleration to the first hurdle is the goal to attain the fastest possible rhythm and optimal time between the hurdles.
- A majority of men will use the 8-step approach, with the lead leg in the back block. Some of the elite men's hurdlers will use a 7-step approach, producing the obvious advantage of enhanced momentum development and the reduction of strides that the hurdler is taking in the race.
- Most women will employ 8 strides to the first hurdle. Although there are women who use 7, the standard thinking is 8 shorter strides from the blocks will permit greater acceleration than 7 longer strides. The 8-step hurdler is more likely to carry a quicker rhythm over the hurdles because the hurdler has 1 more stride than the 7-step hurdler to exert force.
- The start of the race should be attacked with a push for the first 4-5 strides that one would see in normal sprint acceleration. The last 3-4 strides should see a more upright body position to prepare for the first hurdle clearance. Looking up too soon and popping up too quickly should be avoided. Men though will have to basically be "fully upright" to avoid hitting the hurdle.



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- The goal of the hurdler is to create the greatest amount of force to the track in the shortest amount of time (called impulse). Athletes should be reminded to think of "pushing" as in "pushing up a hill," applying force downward to push to vertical. Often athletes will "reach" instead of applying downward force.
 - A hurdler who competes in other sprint events should use the same block settings in those events as they use for the lead leg/ trail leg in the hurdles.
 - Breathing Model: The breath should be held as you go up in to the set position in the blocks and a quick breath blown out (exhale) at hurdles 1-3-5-7-9. Elite hurdlers will likely use a 1-4-7-10 model of breathing. The reasoning is an athlete can produce more force when actively holding their breath (Valsalva maneuver). Sustained maximum motor firing can only be maintained for approximately 2 1/2 seconds and athletes who can master the breathing model will be at a distinct advantage.
 - The goal to the first hurdle is to generate velocity through the barrier and to increase the stride frequency for the succeeding hurdles. A fast time to the first hurdle, as many athletes and coaches think, does not always set the hurdler up for optimal success in the succeeding hurdles.

LEAD LEG

- "The quicker the lead leg, the quicker the touchdown" is the common thinking. The hurdler must attack the hurdle with high knee action generated from the hip flexor muscles.
- A flexed lead leg opposed to straight leg, leading with the knee with a cocked foot (dorsi-flexion) should be emphasized (pull the toe up). Leading with the hip and pointed toe is slower and often causes a straight lead leg.
- The lead arm should be in line with the lead leg knee -"don't reach."
- Emphasize sprint mechanics and posture (Posture needs to be trained - it doesn't just happen).
- The lead leg should be in the back.
block, unless you are 7-stepper to the first hurdle.
- If the body lean is insufficient, especially in men, the hurdler will land on the heel, causing a braking action.
- The lead leg initiates and controls to a greater extent the hurdle clearance.



HURDLE CLEARANCE

- Clearance is the key - clearance is relative to performance. The more time spent in the "air" means less time on the ground producing force.
- The distance that the athlete takes off from the hurdle at take-off is the most important factor in clearance height. The take-off distance affects the angle of travel, and nothing can be changed once the athlete leaves the surface.
- The angle of travel determines distance in landing and is the determining factor in touchdown.
- Distance in landing affects speed to the next hurdle and timing to take-off. If too far - you sail. If hurdler is too close - you vault.
- Recommended take-off and touch-down distance ranges:
 - Men Take-off: 2.0-2.2m
 - Women Take-off: 1.95-2.10m
 - Men Touchdown: 1.15-1.30m
 - Women Touchdown: .80-1.0m
- The parabolic curve should be as flat as possible over the hurdle and is determined on take-off.
- Hurdling is a continuous action. Any deceleration or hesitation in the layout clearance is a detriment. Many hurdlers "freeze frame" or stall during the clearance on top of the hurdle. Continuous arm swing and an active trail leg are very, very important.
- All sprinting is controlled by the arms. Research shows the arms precede the legs in sprinting. Even though the hurdler never reaches maximum speed, the hurdles are a sprint event stressing the arm mechanics in not only the acceleration phase, but in creating velocity through the hurdles. Coaches should always cue athletes to use the arms more vigorously, to create more "arm speed."
- The shoulders/hips should be square to the hurdle as the athlete attacks the barrier. "Square up to the hurdle" is an often heard coaching cue.
- The hurdler attacks the hurdle with the lead arm driving in front of the chest (not across the midline of the chest) at shoulder level. Men often bring the arm somewhat higher than women, looking right under the arm at eye level.



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- It is critically important that the men's hurdlers "run tall" or "drive tall." The hips and chest have to be up and "tall" in order for men to have a smooth clearance of the 42" hurdles.

TRAIL LEG

- The plantar flexors of the trail leg must be allowed to complete the drive, with full extension of the trail leg joint at take-off. The hip circle continues through the thigh crossing parallel to the barrier. Pulling the trail leg through its complete action is critically important.
- As the active trail leg comes forward, the opposite reaction is produced with the backward swing of the lead arm. These actions must be equal in order for the shoulders to stay square with the hurdle, with the lead arm going down and the around the trail leg to counteract the leg mass.
- The trail leg knee should come through the armpit and fully reload to the front high knee position. This is critical for men. Women can often "get away with" not fully reloading the front high knee.
- The three strides between the hurdles are shorter than normal sprint strides. The first stride off the hurdle is the shortest, with the second the longest and the follow-up stride shorter due to the upcoming hurdle.

TRAIL ARM

- The primary purpose of the trail arm is to maintain balance on landing. Many women carry the trail arm too wide and high and this results in undesirable off-balance rotation upon landing. Male hurdlers are forced to perfect this aspect of hurdling due to hurdle height. Excessive rotation off any of the hurdles causes problems for the follow-up hurdle.
- A quick pull through of the trail arm is desirable. A long stroke of the trail arm is typically a slow stroke, with the arms/ hands too far behind the body.

DIFFERENCES BETWEEN MEN AND WOMEN



It is a serious mistake to treat the men's and women's hurdles the same. They are vastly different. Speed is the most important component of the women's hurdles. Although it is also very important for men, technique is just as important in producing quality times. Many of the top women's hurdlers are not technically sound. Some are actually quite poor but excel due to their speed and the lower hurdle heights. Men don't have that luxury. Men must maintain a much higher center of gravity, the lean is much more pronounced, and the trail leg brought through much higher, through the armpit, to name just a few of the obvious technical differences between men and women. The very best men's hurdlers certainly have great speed, but they must be very good technically as well.

TRAINING GUIDELINES/PRINCIPLES "HOW TO GET FASTER"

- Power, speed and sprint mechanics are the three most important ingredients in the hurdles. A large percentage of time must be devoted to developing power and speed!
- Speed development should be the primary focus for women. But velocity through the hurdle is critically important for both men and women.
- Focus on training that produces a *fast* time. Drills are certainly important. But many coaches and athletes over drill. Training and drills that improve rhythm should be emphasized. Remember that rhythm is the type of speed which allows hurdlers to use their technique to the maximum. A hurdler is only as fast as their technique allows!!
- A great deal of time should be spent on training that develops the 3-step rhythm at race speeds - or as close to race speeds as you can obtain - so that the proper neurological motor patterns are firmly ingrained. Too many coaches drill and employ technique work at slow speeds to seek mastery of skills, only to have the athlete falter when they are asked to replicate the same thing at higher race speeds. Coaches and athletes should always remember that practice does not make perfect - it makes *permanent*.
- Our goal in training is to simulate and mimic what will take place in competition. There is, however, a 5-10% drop off in training compared to competition. So, how do we obtain this intensity in training?



1. Reduced hurdle heights: Women hurdling with 30 inch hurdles or lower. Men: Hurdling at 36" or 39". Most of the women's hurdling is done with 30" inch hurdles. Men obviously do some work at the competition height of 42", but certainly not a large percentage. Miniature hurdles, scissor hurdles, speed hurdles and even cones can be used for reduced hurdle heights.
 2. Discounted hurdling spacing: Women train at 8.0m (8.5m is standard) and men 29 feet (30 feet or 9.14m is standard). We do not change the start distance to hurdle 1 for either men or women. The discounted hurdle spacing will allow the athlete to simulate the speeds and rhythm that will be needed in the actual competition.
 3. Race the Sprinter: Place the hurdlers in blocks right alongside of sprinters in a competitive situation, with the hurdlers receiving an advantage and the sprinters starting from a 3-point or 4-point stance.
 4. Place hurdlers in competitive situations for a bulk of your training, where they have to compete head-to-head with teammates. It is very difficult to reach the desired speeds training solo, and this should be avoided. *Although the basics need to be rehearsed over and over, there is no substitute for the real thing. Competitive hurdling in training is a must!*
- Rhythm training should be closely monitored and should be discontinued when fatigue becomes a factor.
 - Speed development should be trained on a daily basis. High-intensity work can direct the intermediate fibers to assume fast-twitch muscle fiber properties. Speed can be trained; it is a neuromuscular skill. Speed work ideally should be included in each and every training session. This is typically not possible due to the need for recovery days. But the goal is to stimulate the central nervous (CNS) system and activate the fast twitch system on a very, very frequent basis.
 - Train starts to 1st hurdle and use the touchdown time charts to check consistency. Many coaches do not work to the first hurdle nearly enough. The first hurdle sets the tone for the entire race! The touchdown time charts are very useful in analyzing training and can serve as a great motivational tool. Teammates and managers can assume this task if manpower is limited.
 - Arm speed/drive is a component that many hurdlers lack and need to train. The use of hand/wrist weights weighing .75 pounds-1.5 pounds can be used to handicap/overload the hurdler. Remember, the arms control sprinting. Hand weights



can also assist hurdlers who have problems with rotational/balance concerns due to arm mechanics. Some arm mechanics coaching cues: 1. Elbows bent at 45 degrees 2. Thumbs up and elbows closely turned in to the body 3. Shorten radius of arms - no sweeping! 4. "Speed up arms".

- Resistance Starts: Use cords, sleds, bike tires, harness, etc. Stress proper push pattern/sprint mechanics with the resistance. Remember the 10% rule: No more than 10% of the athlete's body weight should be used when providing overload for resistance work. Resistance is way too excessive in most cases. The athlete's time should not be slowed by more than 10% as well.
- The use of video is an age-old coaching tool. A different twist: Have athletes and teammates video with their own cell phones and use that to analyze their own hurdling as well others post practice/training session. Video can often cause an over analysis of the athlete and should be used in explicit teaching situations. Another helpful aid is to have athletes demonstrate and model the different drills/technique.
- Raised cardboard, bubble wrap, chalk or athletic tape can be used to assist athletes in hitting the desired take-off, touchdown marks and cut step. The coach should be careful, however, to not allow the athlete to look "down" and use it as a visual cue. The athlete must develop a "feel" for the mark.
- Emphasize that sprint posture/ mechanics must be done correctly at all times, including warmup when coaches can observe and make corrections and offer coaching cues. Many athletes suffer posture problems due to a weak core. Core strength should be emphasized in every hurdler's training. Poor posture is often times caused by a lack of focus and concentration. Accordingly, any exercise should be stopped when the technique is not sound.
- Bounding should be a part of the athlete's warmup and workout sessions to build the needed explosive power that a hurdler requires.

MARAUDER HURDLE DRILLS: DRILLS THAT WORK; DRILLS THAT PRODUCE RESULTS

Lead Leg-Trail Leg Drill Any number of hurdles set at very short spacing with drills done on the side of the hurdles at low heights. Athletes rehearse the lead and trail leg mechanics at different speeds ranging from walking to running at 75-80%. The drill can be done



walking, marching, skipping or running. Another version of the lead leg-trail leg drill is to march through the hurdles with even shorter distances employing fast feet and fast arms, with an emphasis on the arm speed. The drill can be done with spikes, but preferably flats.

Arm Drills Any number of lower hurdles (30" or lower for women; 36" for men) can be used for this drill at reduced, discounted spacing (28 feet for men and 7.0 meters for women, although spacing is not critically important because the drill is done at slower controlled speeds). The drill is misnamed in that the athlete must hurdle at slower speeds (75-80%) without using the arms. There are three versions:

1. **Regular** Athlete hurdles from a standing start any number of hurdles with the arms extended out in front of the body in a locked position.
2. **Fly** Same as #1, except arms are extended like wings
3. **Chest** Same as 1 and 2, except arms are held tightly folded to the chest (Helpful if the athlete grabs shirt).

Coaching cues: Emphasize leading with the knee, squaring up hips and shoulders to the hurdles, and letting the body balance itself without the use of the arms. It is a great drill to teach body awareness and balance to eliminate rotational problems. The arm drills are typically done in flats.

One Step Hurdles From a standing start on the start line, hurdle any amount of hurdles spaced so that the hurdler has only 1 step to clear the hurdle. The 1st hurdle can be on the mark and others spaced at low heights 12-13 back-to-back steps for both men and women. The drill teaches athletes to lead with the knee, flexed lead leg, projecting hips through the hurdle and getting down very quickly with an active trail leg. It is also useful to eliminate a "swinging" of the lead leg. The drill should be done in spikes at controlled speeds, with an emphasis on arm speed and projecting hips through the hurdle.

Tempo Hurdles Set(s) of any number of hurdles done in spikes with regular hurdle form with close to all out intensity.

Example: 5 Hurdles x 3 x 2 Athletes should be given ample recovery between reps and sets to assure that the correct motor patterns are trained. A good rule of thumb is 3-3 1/2 minutes per rep and 4-4 1/2 minutes per set. Typically we don't use more than 5-6 hurdles



in this drill due to the fatigue factor. Often, only 3-4 are used. The first hurdle is on the standard mark with the following discounted hurdles of 7.5-7.7m for women and 8.53m. (28 feet) for men. Spacing can be modified to assure that the athlete is simulating the desired competition stride frequency. Hurdle heights can vary (we even alternate heights) but are typically lower, especially for men. Heights can also vary between sets. Tempo hurdles are done as a preliminary drill leading up to actual hurdling from blocks and should be done in spikes from a 4-point or 3-point start. (We typically use a 4-point stance simulating their normal block start)

Shuttle Hurdles Athlete hurdles one lane of barriers in one direction and turns around and returns in another lane of hurdles, doing a series of loops/reps. The hurdles can be set at any height, although lower heights would typically be used as less energy and force is required for the lower heights in a drill that can be very demanding. The drill should be done in spikes with sets of different recovery times, depending on the objective. It is obviously a great drill for the intermediate hurdler in terms of teaching alternating legs, making adjustments (steering) and simulating the demands of the 400 hurdle race in terms of fatigue/energy systems. It teaches the athlete to hurdle in a fatigued state.

Lead Leg/Trail Leg Wall Attack Drill With a low hurdle against wall, fall forward into wall and attack with the lead leg, stressing a flexed lead leg with a cocked foot and leading with the knee. The opposite arm also drives into the wall. Another version of this drill is to take one step and then fall forward into wall. The hurdle can be moved out too and trail legs can be done on the side of the hurdle. Another version is to place hands on wall and go back and forth in a stationary position alternating the trail leg movement over the top of the hurdle. The drill should be done in flats.

Race Endurance Simulation Drill Repeat hurdle reps from blocks with spikes using discounted hurdles and spacing and very little recovery. The hurdler jogs back and goes immediately from blocks again. The recommendation is to use 6-7 hurdles. A break-down in speed and mechanics on the second rep will indicate too many hurdles are being used. The drill is used to train speed maintenance in the closing stages of the race.

SPEED/SPEED ENDURANCE



There are those that argue that the short hurdles are not a sprint event. Be that as it may, one cannot argue that it is not a speed event. Nearly all elite men's and women's hurdlers take the same number of strides in a race (51). So it is reasonable to assume that the hurdler with the greatest stride frequency should have the most success, providing power and technical efficiency are equal to the other competitors.

Speed endurance needs to be a component of all sprint hurdlers. Many hurdlers who perform very well indoors are very substandard when the additional barriers are added outdoors and the speed endurance ingredient is lacking. Different combinations of hurdles and recovery time can certainly increase speed maintenance. But short hurdlers will need the different types of speed endurance training to be an elite hurdler and maintain the desired speeds over hurdles 6-10. The short hurdler needs to be able to run a very quality 200/300m to be an elite 100/110m hurdler!

A brief explanation of the training that a sprint hurdler should utilize:

SPEED Runs of 95-100% intensity over 30-60 meters or up to six seconds of running. Example: 4 x 40m Blasts with spikes from blocks @ 100% intensity with 5-6 minutes recovery per rep.

SPEED ENDURANCE Runs of 95-100% of maximum over 60-150m or 7-20 seconds of running. Example: 3 x 80m @ 95-100% from 4-point stance with 4-5 minutes rest, 10 minutes recovery followed by 1 x 150m with spikes @ 95% intensity.

SPEED ENDURANCE 1 Runs of 95-100% of maximum over 150-300m or 20-40 seconds of running. Example: 2 x 150m with spikes @ 95% intensity with 6 minutes recovery, 10 minutes recovery between set, 1 x 200m with spikes @ 95-100% intensity.

SPEED ENDURANCE 2 Runs of 95-100% of maximum over 300-600m or 40 seconds of running or over. Example: 2 x 300m with spikes @ 95% intensity with 8 minutes recovery, 12 minutes Recovery between set, 1 x 350m with spikes @ 95-100% intensity.

STRENGTH, WARMUP, SUPPLENESS



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STRENGTH Without getting into specifics, the strength program chosen should emphasize functional strength: sport-specific strength that the athlete can actually use. Most authorities will agree that medium loads with a fast series of repetitions are typically what most hurdlers/sprinters need. There will be a need too for some heavy loads to train the power that is needed in the acceleration phase. If you are a coach that does not set up the training programs for your athletes, constant, daily communication with the strength coach is essential.

WARMUP There are many types of warmup programs that can be utilized. Most coaches acknowledge that a dynamic, continuous warmup is most suited for high performance training and competition. Regardless of what type of warmup is used, it must train flexibility, power, sprint mechanics, balance and strength in addition to serving to prepare the body for performance and prevent injury. Time must be devoted to mobility and assuring that the hurdler is very supple. The extreme range of motion that is required for an elite hurdler must be trained. The warmup should really be looked upon as a speed improvement tool in itself.

SAMPLE OFF SEASON TRAINING WEEK

Monday: am-Hurdle Technique pm- Speed Endurance 2 Interval Training, Strength Training

Tuesday: Recovery - (Circuit Training, Speed Circuits, Med Ball Training, Elliptical, Stationary Bike)

Wednesday: am-Hurdle Technique pm-Speed Endurance 1 Interval Training, Strength Training

Thursday: Recovery - (Circuit Training, Speed Circuits, Med Ball Training, Muliti-Jump Med Ball Training, Elliptical, Stationary Bike) Strength Training

Friday: Hill work or Speed Endurance Saturday: Rest

Sunday: 20 minutes Light on Elliptical or Stationary Bike

ACTUAL TRAINING WEEK - JOSH LAMERS WEEK 31 APRIL 9-15



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Note: Actual Training week for Josh Lamers, who ran 13.85 to place second in the 110m Hurdles at the 2018 NCAA Division II Outdoor Championships

Monday, April 9 - Hurdle Technique followed by 1 x 250m w/spikes @ 95-98%, 12 minutes Recovery, 1 x 200m w/spikes @ 95-98%, Strength Training

Tuesday, April 10 - Stationary Bike 15 minutes, Warmup, Accels w/spikes, Orange Med Ball Circuit (15 Throws)

Wednesday, April 11 - Hurdle Technique followed by 3 x 150m w/spikes @ 95% 6 minutes Recovery, Strength Training

Thursday, April 12 - Warmup, Recovery Circuit, Accels w/spikes

Friday, April 13 - Pre Meet Hurdle Technique Warmup

Saturday, April 14 - Meet @ NDSU in Fargo ND

Sunday, April 15 - 20 minutes Elliptical (Recovery)

ACTUAL MEN'S 110M HURDLE TECHNIQUE TRAINING SESSION

Monday, March 12 (Outdoors)

Marauder Warmup

Walking Arms 2 x 10m

Walking Lunge Backwards 2 x 10m Accels 4 in flats

1 Step Hurdles 5 Hurdles x 3 @ 36 inches

1 x Flying 20 on turn (Time)

40m Blast From Blocks (Time)



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Tempo Hurdles 6 Hurdles x 2 @ 39" (From a 4-point start)

4 Hurdles From Blocks with hand weights @ 39" x 1

4 Hurdles From Blocks x 1 @ 36"

7 Hurdles From Blocks x 2 @ 42" for the first hurdle and 39" for following 6 hurdles (Time)

6 Hurdles from Blocks x 1 @ 42" for the first hurdle and 39" for the following 6 hurdles (Time)

15 minutes Stationary Bike (Recovery)

NOTE: Spikes for 5-12

ACTUAL WOMEN'S 100M HURDLE TECHNIQUE SESSION

Tuesday, March 20

Marauder Warmup

Sitting Stationary Arms 2 x 20 seconds

Cone Hops (Big - 12 inch cone) with Eyes Closed 2 X 20 seconds

Accels 4 in spikes (Spikes worn through the remainder of the session)

Lead Leg-Trail Leg Drill 3 Hurdles 2 on each leg

Arm Drill 3 Hurdles x 2 with the Arms to the Chest

1 x 30m Fly on turn (Time)

1 x 30m From Blocks (Time)

Tempo Hurdles 4 Hurdles x 3 @ 30" From a 4-point start



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3 Hurdles From Blocks x 2 with hand weights 33"- 30"- 30"

1 x Flying 20 on straight (Time)

7 Hurdles From Blocks x 1 33" for first hurdle followed by 30" (Time)

3 Hurdles From Blocks with hand weights x 1 @ 33"-30"-30"

6 Hurdles From Blocks x 2 @ 30" (Time)

Warmdown - Jogging barefoot followed by foam roll and 10-15 minutes Stationary Bike

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