A Methodical Approach for Developing High Hurdlers

By Coach Karim Abdel Wahab

Colorado State University's sprints, hurdles and relays coach

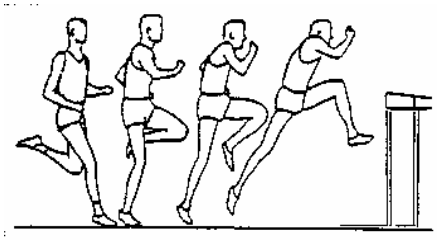
This presentation includes the annual training plan for Colorado State University's high hurdlers, and basic explanations of targeted performance criteria, as well as the Ram's methodical approach in developing high hurdlers. The technical and physiological objectives of the training plan comply with the basic understanding of general biomechanics and sports physiology concepts held by the vast coaching community. The following philosophy and methodology were implemented in developing 2012, NCAA D-1 Second Team All-American student athlete, Trevor Brown, who lowered his PR in the 110m hurdles from 14.21 to 13.75 between his freshman and sophomore year, and moved up to be 8th in the NCAA D-1 110h finals in 2013 with a season best of 13.55(w) receiving a first team All American Honors. Trevor's improvements in the 60 hurdles indoors were as follows: 8.30 in 2010 senior in High School over 42" hurdles, 7.91 freshmen in CSU, 7.86 sophomore and 7.77 Junior in 2013. Trevor currently holds CSU and the Mountain West Conference records in the 110 and 60 m hurdles. Go Rams!!!

Establishing a High Hurdling Development Philosophy

- **Stride length and stride frequency are the parameters for faster sprinting. What about hurdling?** In hurdling, stride frequency between hurdles is the limiting factor. A 15sec hurdler covers the race distance using the same number of strides as a 13 sec hurdler; they both take 50 strides over the race distance (8 strides at the start + 3 strides between hurdles x 9 hurdle spacing + 10 hurdle clearance strides + 5 steps between the last hurdle and the finish line). Therefore, the ability to accelerate to the first hurdle, efficient hurdle clearance mechanics, stride frequency/efficiency between hurdles, re-accelerate after hurdle clearance, and the aggressive acceleration from the last hurdle to the finish line are the elements that need to be developed in any high hurdling training plan.
- **What does it mean for hurdlers to be "aggressive"?** Since the distance between the 10 hurdles is consistent then the "average" sprinting stride between hurdles will have to be also consistent, thus for hurdlers to run faster between hurdles they would have to turn over "shuffle" faster. "Shuffle" is a term that refers to sprinting faster between hurdles without ANY increase in stride length. If hurdlers develop a longer stride length than desired they will "run out of room" and end up hitting or crashing into the hurdles. A longer stride length than desired between hurdles is the direct result of loss of the aggressiveness!
- **A balanced speed development approach is required for hurdlers:** Developing inner hurdling average stride length shuffling capabilities is crucial as previously mentioned, but general speed, strength, and power development qualities cannot be neglected in training. This recommendation strongly applies to hurdlers that do not have a high level of natural speed. The hurdler's sprint stride length during flat sprinting is typically greater than the average inner hurdler stride length. This allows hurdlers to sprint between hurdles at a lesser percentage of their maximum stride length, which will carry over to a faster frequency and better maintenance of rhythm throughout the high hurdle race.
- **Hurdle clearance stride length:** Hurdle clearance stride length is the distance between the point of planting the take-off foot at hurdle take-off and the point of ground contact at landing after the hurdle. The hurdle clearance stride length will have to be consistent throughout the hurdle race for the average sprinting stride length between hurdles to be consistent. The consistency in the "average" stride length between the hurdles, as well as, the length of the hurdle clearance stride are the keys for targeting turnover "shuffling" development in between the hurdles.

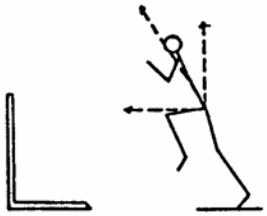
- **Minimum loss of horizontal velocity:** High hurdlers cannot afford to lose much horizontal velocity throughout the race. Here are some general guidelines to minimize the loss of horizontal velocity in high hurdling:

(Figure 1)



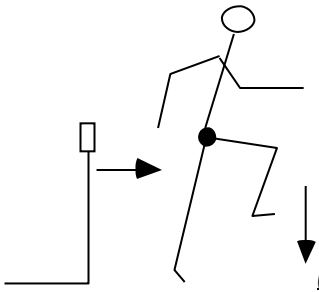
A. *Getting in a tall body posture early enough before the first hurdle (Figure 1)*: Around the fifth stride the hurdler needs to transition to a tall upright body posture, to allow the center of mass to be at a maximally high launching level. Correspondingly, only a slight vertical impulse is needed to clear the hurdle, creating an optimal parabolic curve for the center of mass. Hence, the hurdler would be able to carry more velocity through the hurdle.

B. *"Power leg" and "Cut step" concepts at hurdle take-off (Figure 2) and re-accelerating after the hurdle (Figure3):* The trail leg or "power leg" is very special when it comes to power production. The steps taken by the trail leg are longer than the steps taking by the lead leg throughout the hurdle race. A hurdler uses their trail leg to perform two "cut step" actions, the first is during take-off and the second is during re-acceleration after the hurdle. The take-off step is typically shorter in length than the preceding stride, the hurdler needs to actively "cut the take-off step" making sure the foot plants under the hips. This reduces the braking force and allows speed to be carried through the hurdle. Hurdlers need to have a lower heel recovery going into the take-off step to accomplish an active cut step at hurdle take-off.



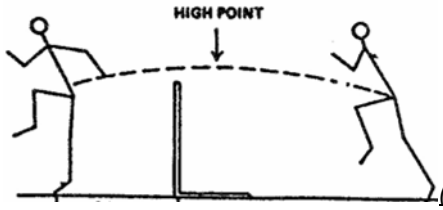
FORCES AT THE TAKE-OFF
Horizontal and vertical velocities determine the take-off angle. *(Figure 2)*

The second "cut step" is performed after the hurdle by the trail leg at the get-away stride, the hurdler's foot actively lands under the hips to avoid braking force. This allows an efficient push-off action that will create an ideal re-acceleration between the hurdles.



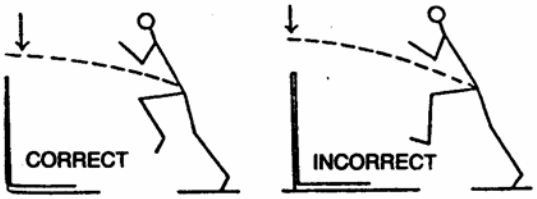
(Figure 3)

C. *Taking off at an appropriate distance from the hurdles based on the hurdlers' height/ anthropometric differences (Figure4):* Hurdlers need to take off at an appropriate distance from the hurdles to maintain an optimal horizontal parabolic curve. Thus, helping "displace the hips through the hurdles" with the minimum loss of horizontal velocity. If take-off is too close to the hurdle, then it will either result in crashing into the hurdle or jumping vertically to avoid the hurdle, in both cases there will be a great lose in horizontal velocity. Below is the "Model Take Off-Landing" table based on men and women hurdlers' height (Coach Curtis Frye).



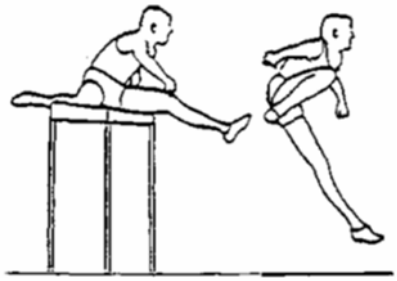
(Figure 4)

D. Leading with the knee at the lead leg during hurdle take-off *(Figure 5):* Leading with the knee at take-off allows the avoidance of having a larger vertical parabolic curve of the center of mass at hurdle clearance. Leading with the knee will result in carrying a larger horizontal velocity through the hurdle.



CORRECT AND INCORRECT TAKE-OFFS
Correct (left): High knee lift at the take off.
Incorrect: A locked knee raises centre of gravity and height. *(Figure 5)*

E. Minimizing the amortization at lead leg ground contact while landing after the hurdle *(Figure 6):* The lead leg should be grounded in an extended and vertical posture. It also must not yield to the landing pressure to which it's exposed to after the hurdle clearance stride. This will prevent the drop of the center of mass at the landing after the hurdle, which can result in losing horizontal velocity.


(Figure 6)

F. Eliminating the "slack" in the system while sprinting between the hurdles: Having a tall body posture while sprinting between the hurdles allows the hurdlers to carry as much horizontal velocity as possible. This tall body posture will put the hurdlers' muscular system under pre-tension. This will allow the hurdlers to take advantage of an effective and explosive stretch-shortening cycle in every stride between the hurdles.

5 step pattern guidelines: http://www.youtube.com/watch?v=EKgqZphz3No

1- The hurdles inner spacing that is used during the training plan is typically shorter than regulation spacing, this develops turn over and proper "shuffling" capabilities for high hurdlers.

2- Over the six phases of the training plan the inner spacing progresses from shorter to longer, and occasionally regulation spacing is implemented.

3- 5 step stride patterns are used throughout the training plan for various objectives. The average stride length used in any 5 step stride pattern always mirrors the desired average stride length for the 3 step stride pattern implemented in any specific phase of training.

4- The main goal is to keep the hurdlers locked in using a consistent average stride length whether they use 3 step stride pattern or 5 step stride pattern in any given phase of training. Using 5 step stride patterns between any hurdling unit allows for velocity to carry over to a subsequent 3 step stride pattern unit. This will develop specific "shuffling" capabilities in every training phase.

5- The distance between hurdles for the 5 step pattern can be easily calculated. First subtract the hurdle stride length out of the desired distance between hurdles for 3 step pattern. Second, divide that number by 3, then multiplying it by 5 (these are the number of step utilized in inner hurdling stride patterns). Third, add the specific hurdle clearance stride length that corresponds to your athletes' height.

6- Take-off and landing distances should always be the same throughout the training plan to create consistency. This will make the development of the average stride's turnover become the prime focus of training.

7- The table below shows the distances in meters used in the 3 step inner spacing with corresponding 5 step patterns for a 5'10" male and 5'7" female hurdlers:

	3-Step			5-Step	
"steps in"	m	Men	Women	Men	Women
Normal	none	9.14	8.50	13.00	12.00
(-1 foot)	0.32	8.82	8.18	12.47	11.47
(-2 feet)	0.64	8.50	7.86	11.93	10.93
(-3 feet)	0.96	8.18	7.54	11.40	10.40

The training Plan

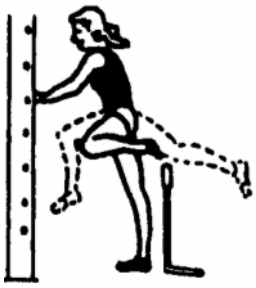
Hurdle specific w-up drills "*The Magnificent Seven*"

<u>Hurdles Drills Philosophy:</u> We will do few things and get really good at them, instead a lot of things and be average!

1- *Walking through hands* http://www.youtube.com/watch?v=zYBUE_EF254&feature=youtu.be
2- *Trail leg over and back (Figure 7)* http://www.youtube.com/watch?v=LE4RMXo6UWQ&feature=youtu.be

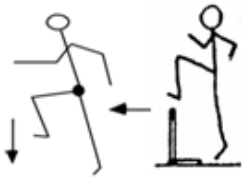
(Figure 7)

3- *Stationary trail leg cycle (Figure 8)* http://www.youtube.com/watch?v=3UIJ92IClaw , http://www.youtube.com/watch?NR=1&v=n2mmKVqR0jY&feature=endscreen



(Figure 8)

4- *Snap over hurdle and push off (Figure 9)* http://www.youtube.com/watch?v=ze7Zsx5I4DU , http://www.youtube.com/watch?v=FEuylECH3fs



(Figure 9)

5- *5 meter 3 stride pattern hurdling*
   A- Trail leg: http://www.youtube.com/watch?v=ohCaHYPcRbI&feature=youtu.be
   B- Middle: http://www.youtube.com/watch?v=Y2XkLZwH-P4&feature=youtu.be
   C- http://www.youtube.com/watch?v=djgFL1mr_Yc&feature=youtu.be
6- *One step hurdling (from trail leg side and from the middle).*
   A- Trail: http://www.youtube.com/watch?v=rX_9H-8IkKE&feature=youtu.be , http://www.youtube.com/watch?v=sCDbvMz6W-o&feature=youtu.be
   B- Middle: http://www.youtube.com/watch?v=RYQiNAIMsLQ&feature=youtu.be
7- *Cut step into tight lead drill* http://www.youtube.com/watch?v=2giFc-U52q4 , http://www.youtube.com/watch?v=38i2j2wmnJU

Hurdle CNS turnover w-up drills

1- *Dribbling*: 8m stepping over knees, 8m stepping over calves and 8m stepping over ankles. http://www.youtube.com/watch?v=JCNE6EI6byw
2- Dribbling endurance over 60m 20-20-20: http://www.youtube.com/watch?v=TN11YnxS5u8&feature=youtu.be
3- *Fast leg drill:* run over tape marks up to 18-27 steps stride length goes short to long start at 4 feet (two units) then 4'3" (two units) then 4'6" (two units) etc., up to 6'4" for women and 6'8" for men. http://www.youtube.com/watch?v=TxrtTxDSWns&feature=youtu.be
4- *Hurdle on side:* flip hurdles with rail toward the starting line, spacing 21' between hurdle 1-2, 22' between hurdles 2-3, 22' 6" between 3-4 and 23' between 4-5. Use the same spacing for men and women and take 4-5 step approach before the first hurdle.

Some ideas to teach and fix mechanics:

1- *To teach leading with a tight lead leg:* http://www.youtube.com/watch?v=T9ArtCSBeas
2- *To teach the position of re-acceleration off of the hurdle:* http://www.youtube.com/watch?v=3gZc5917J8o

Fall A
3-4 weeks
Skill development phase 1

Phase Objective:

1- Proper take-off foot planting at hurdle take-off:
2- Developing proper take-off distance into the hurdle "more of a horizontal parabolic curve".
3- Leading with the knee with the lead leg at take-off.
4- Tight trail leg over and through the hurdle.
5- Trail leg landing after the hurdle with a positive shin angle at ground contact.
6- Tall body posture between the hurdles.
7- Teaching the skill of shuffling "turn-over" between the hurdles.

Main Hurdling Workout on Thursday:

A. **One set over multiple reps of:** 5 step stride x 3-5 hurdles x 8 step standing start (distance between hurdles: Men 11.40m – Women 10.40m which mirrors 7.6m for women and 8.2m for men in a 3 step stride pattern) x 50cm hurdle for women and 99cm hurdle for men.
   1- Trail leg: http://www.youtube.com/watch?v=4mBWftJ9wdY
   2- Middle: http://www.youtube.com/watch?v=EKgqZphz3No
B. **One set over multiple reps of:** 3 step stride x 3-5 hurdles x 8 step standing start (distance between hurdles: Women 7.30m for women and 7.9m for men) x 50cm hurdle for women and 99cm hurdle for men. http://www.youtube.com/watch?v=-Lygp6BxXFA&feature=youtu.be

C. **Max velocity speed work can be done after hurdling if needed:** hurdle volume needs to be adjusted in that case.

D. **Hurdles specific Strength endurance on a non-hurdling day, possibly done on the speed endurance day**: reps of 20m A runs.

- **Dedicate a day per week for acceleration development with no hurdles in this training phase; Max velocity work can also be done on the same day after the acceleration work.**

Notes:

1. Shorten the approach to the first hurdle 1 inch per-stride in this phase.
2. Using towels to mark take-off before hurdles.
3. Start in week one using 3 hurdles and progress gradually over the weeks to 5 hurdles.
4. 24"-27" hurdles are utilized for women starting this phase and throughout the training plan.
5. Using 5 step stride patter allows:
   A. More time between the hurdles for the hurdler to response to the coaching cues.
   B. Develop enough velocity between the hurdles, while utilizing tightly jammed running strides, to help make the skill of taking off far from the hurdles feels comfortable and attainable.
6. Using a standing start in this phase helps teaching the hurdlers the importance of a tall body posture at the 1st hurdle take-off.

7. Marking appropriate take-off and landing marks before and after each hurdle based on athletes' height (Check the table below).

Model Take Off-Landing:

MEN

Ht	Take-off	Landing
5'3"	7'5"-7'9"	2'9"-3'3"
5'5"	7'4"-7'8"	3'0"-3'3"
5'7"	7'3"-7'7"	3'3"-3'9"
5'9"	7'2"-7'6"	3'6"-4'3"
5'11"	7'1"-7'5"	3'9"-4'8"
6'1"	7'0"-7'4"	4'0"-3'10"
6'3"	6'10"-7'3"	4'3"-3'8"
6'5"	6'10"-7'2"	4'6"-3'6"

WOMEN

Ht	T-O	Land
5'3"	6'5"-6'9"	2'9"-3'3"
5'5"	6'4"-6'8"	3'0"-3'6"
5'7"	6'3"-6'7"	3'3"-3'9"
5'9"	6'2"-6'6"	3'6"-4'3"
5'11"	6'0"-6'5"	3'9"-4'5"
6'0"	5'10-6'3"	4'0"-4'6"

Fall B

3-4 weeks

Skill development phase 2

Phase Objective:

1. Continue to teach and enforce the same qualities introduced in the last training phase.
2. Developing more coordination, turnover " shuffling" between the hurdles and enhance rhythmic qualities over the hurdles by adding more verity and mixing 3 and 5 step stride patterns in the same repetitions.

Main workout on Thursday:

A- **One set over multiple reps of:** 3/5 step stride x 5 hurdles x 8 step standing start (distance between hurdles: Men 5 step 11.40m, 3 step 8.2m – Women 5 step 10.40m, 3 step 7.6m). **Example:** of a 3/5 step stride pattern would be something like: 8 step start to hurdle one, 5 steps between hurdle one and two, 3 steps between hurdles two and three, 5 steps between hurdles three and four then ending with 3 steps between hurdles four and five. X 60cm hurdle for women and 99cm hurdle for men.

B- **One set over multiple reps of:** 3 step stride x 5 hurdles x 8 step standing start (distance between hurdles: Women 7.6m for women and 8.2m for men). X 60cm hurdle for women and 99cm hurdle for men.

A. **Max velocity speed work can be done after hurdling if needed:** hurdle volume needs to be adjusted in that case.

B. **Hurdles specific Strength endurance on a non-hurdling day, possibly done on the speed endurance day**: reps of 40m A runs.

- **Dedicate a day per week for acceleration development with no hurdles in this training phase; Max velocity work can also be done on the same day after the acceleration work.**

Notes:

1. Using towels to mark take-off before hurdle.
2. Shorten the approach to the first hurdle 1 inch per-stride in this phase.

Fall C

4 weeks

Acceleration development over 5 hurdles

Phase objective:

1. Power leg development "Trail leg cut step at take-off & trail leg re-acceleration after hurdles".
2. Developing a speed curve that is ideal over the first 5 hurdles "no crashing of speed curve after 2-3 hurdles, and accelerating through 5 hurdles at least!".
3. Developing proper mechanics of block exit and approach to the first hurdle out of blocks.

Notes regarding the 5 step start:

In the next phase of training a 5 step start drill will be implemented. Hurdlers don't get much velocity built into the first hurdle when starting out of 5 step approach. Without much speed build in the first hurdle there won't be much room for error, take off foot should be planted properly "down and back" to create the cut step effect. Hurdlers need to be low over the hurdles to carry over as much velocity as possible "through the hurdle". There is no time for floating over the hurdles, "Lead leg and trail leg are racing to the ground" at landing after the hurdle. Trail leg will have to come through tight and land explosively with a positive shin angle at ground contact to start the aggressive re-acceleration and build more velocity between hurdles 1-2. There is no tolerance for over-striding between hurdles! To get to the next hurdle faster hurdlers have to be efficient, aggressive and powerful. The coach is timing touch down units between a set of 5 hurdles and the timing units should be decreasing as the hurdlers are re-accelerating and efficiently creating more velocity. If they are not efficient and aggressive the speed curve will be slower over the 5 hurdles. Doing few reps of the 5 step start drill followed by doing few reps of 8 step start out of blocks will create contrast training effect and will help carry over the efficiency and aggressiveness developed from the 5 step start to actual hurdling!
http://www.youtube.com/watch?v=uYzvPiz0C0k&feature=youtu.be

Main hurdle workout day one on Monday:

A- One step hurdling x trail leg side x 5 hurdles 3.5-4 m/91cm for men and 3-3.5 m/60cm for women x 2 reps.
B- One step hurdling x the middle x 5 hurdles 3.5-4 m/91cm for men and 3-3.5 m/60cm for women x 2 reps.
C- One set x 2-4 reps x 5 step start x 5 hurdles (7.6 between hurdles 1 and 2 and 7.9m between hurdles 2-5 for women over 60cm hurdles – 8.5 m distance between the hurdles for men over 99cm hurdles) x 3 stride pattern all the way. 5 step start for men is around 9m and for women is around 8m.
http://www.youtube.com/watch?v=uYzvPiz0C0k&feature=youtu.be
D- One Set x 2 reps x 8 step start out of blocks x 3 step stride pattern all the way x 7.9m for women and 8.5 m for men. (To create contrast training effect from doing 5 steps start hurdling followed by 8 steps start hurdling). X 60cm hurdle for women and 99cm hurdle for men.
E- Hurdle volume can be reduced today if flat acceleration work needs to be done.

Main hurdle workout on day two on Thursday:

A- 1 – 2 sets x 2-4 reps x 5 hurdles x 8 steps standing start x 5 step stride pattern x 70cm/11.20m for women and 99cm/12.20m for men.

B- Hurdle volume can be reduced today if flat max velocity work needs to be done.

Notes:

1. Hurdles specific Strength endurance on a non-hurdling day, possibly done on the speed endurance day: reps of 60m A runs.
2. Frequency and volume of hurdle w-up drills are reduced.
3. Starting this training phase and until the end of the training plan start utilizing regulation distance for the start.

Fall D

4 weeks

Acceleration development over 5 hurdles and indoor season pre-competition preparation

Phase objective:

1. Continue to enforce and develop the "Power Leg" qualities as in the last training phase.
2. Improving the speed curve over 5-6 hurdles by continuing to enforce the qualities of re-acceleration, aggressiveness and efficiency as in the last training phase.
3. Developing proper mechanics of block exit and approach to the first hurdle out of blocks
4. Introducing regulation height hurdling in parts of the workouts.
5. Introducing assisted regulation hurdling "Height and spacing": to help transition to full regulation hurdling in the upcoming competitive season "Indoor Track Season".

Main hurdle workout day one on Monday:

A- One step hurdling x trail leg side x 6-7 hurdles 3.5-4 m/99cm for men and 3-3.5 m/76cm for women x 2 reps.

B- One step hurdling x the middle x 6-7 hurdles 3.5-4 m/99cm for men and 3-3.5 m/76cm for women x 2 reps.

C- 2-3 reps x 5 step start x 5 hurdles x 3,3,5,3 stride patter (7.6 between hurdles 1 and 2, 7.9m between hurdles 2-3, 10.93m between hurdle 3-4 and 7.9m between hurdles for women over 76cm hurdles. For men 8.5m distance between hurdles 1-3, 11.93m between hurdles 3-4 and 8.5 between hurdles 4-5 over 99cm hurdles. 5 step start for men is around 9m and for women is around 8m.

D- 2 reps x 8 step block start x 3 step pattern all the way x 4-5 hurdles x 8.2m/76cm for women and 8.8m/ 99cm for men.

E- Hurdle volume can be reduced today if flat acceleration work needs to be done.

Main hurdle workout on day two on Thursday:

A- 1 set x 2-3 reps x 5 hurdles x 10-12 steps standing start x 5 step stride pattern x 76cm/11.47m for women and 99cm/12.47m for men.

B- 1 set x 2-3 reps x 5 hurdles x 8 steps standing start x 5 step stride pattern x 76cm-84cm/11.47m for women and 99-106cm/12.47m men (move hurdles up gradually to regulation start with h5,4 then 3,2 then hurdle 1)

C- Hurdle volume can be reduced today if flat max velocity work needs to be done.

Notes:

1. Hurdles specific Strength endurance on a non-hurdling day, possibly done on the speed endurance day: reps of 80m A runs.
2. Frequency and volume of hurdle w-up drills are reduced.

Overview on women hurdle height progression over the four training phases of the fall

- **Women high hurdlers have a great advantage of minimally deviating from sprinting mechanic due to the shorter hurdle height when compared to the men's hurdle height.**
- **The training plan progresses over the fall from 50cm/20" gradually to 84cm/33" to help develop confidence and establish a horizontal parabolic curve during hurdle clearance.**
- **The aim is to teach women hurdlers to sprint through the hurdles and gradually increase the hurdle height while continue to emphasize sprinting through the hurdles.**
- **The progression below shows the women's hurdle height increments utilized over the fall training period.**

Fall A on Monday Only 50cm hurdles used	
Fall B on Monday Only 60cm hurdles used	
Fall C on Monday Only 60cm hurdles used	**Fall C on Thursday** Only 70cm hurdles used
Fall D on Monday Only 76cm hurdles used	**Fall D on Thursday** 76cm in the beginning of every training session and gradually moving to 84cm by the end of every training session.

Indoor

8 weeks

Top Speed Development and race preparation

Phase Objective:

1- Maintain and enhance the power leg and re-acceleration qualities gained from the last phase.
2- Developing top speed over the hurdles.
3- Carrying over all the qualities developed over regulation hurdling.
4- Modeling the sprint after the last hurdle to the finish line.
5- Racing preparation.

Main hurdle workout day one on Monday:

A- 2-3 reps x Weighted vest x 5 step start x 3/5 step pattern x 5-7 hurdles (up to 5lb for women and up to 7lb for men) (Distance between the hurdles for women 7.3m - 7.6m between hurdle 1 and 2 - 7.9m between 2 and 3 - 8.2 m starting 3rd hurdle and up – For men the spacing will be 8.5m between hurdle 1 and 2 and 8.8m starting 2nd hurdle and up – when 5 step units get implemented the spacing for women will be 11.47m and for men 12.47m) 5 step start for men is around 9m and for women is around 8m. 76cm hurdle for women and 99cm hurdle for men.

B- Competition x 1-2 starts over 2-3 hurdles x 3 step pattern + sprint for 10m till the cone "finish line" x 8.2m/76cm for women and 8.8m/99cm for men.

C- Hurdle volume can be reduced today if flat acceleration work needs to be done.

Main hurdle workout on day two on Thursday:

A- 1 set x 2 reps x 5 hurdles x 3 step pattern x trail leg x 8.5m/99cm for men and 7.9m/76cm for women.
http://www.youtube.com/watch?v=5VIVzqUgT24&feature=youtu.be

B- 1 set x 2 reps x 8, 5,5,3,3 x 11.47m/8.2m/76cm for women and 12.47m/8.8m/99cm for men.
http://www.youtube.com/watch?v=hyHj8eVlIJ0&feature=youtu.be

C- Hurdle volume can be reduced today if flat max velocity work needs to be done.

Notes:

1. Hurdles specific Strength endurance maintenance: reps of 20m A runs.
2. Frequency and volume of hurdle w-up drills are reduced.

Outdoors

10-14 weeks

Specific rhythmic endurance development

Phase objective:

1- Top speed development over hurdles.
2- Rehearsing starting mechanics and approach to hurdle 1.
3- Developing specific rhythmic endurance over hurdles.

Main hurdle workout day one:

A- Review starting mechanics and do starts over 1, 2 and 3 hurdles x 76cm-84cm/8.2m for women and 99cm-106cm/8.8m for men.
B- 12 hurdle drill variation - 9 hurdle drill variation x 2-3 reps (out of regulation start with women 3 step stride at 8.2m and men 3 step stride at 8.8m, corresponding 5 step units can be implemented in the 9 hurdle and 12 hurdles drills) (To develop specific rhythmic endurance over hurdles)

- **Note: To predict potential competition times in practice:**
  - **For Women 100m hurdle:** 12 hurdles @ 76cm x 8.2m between x 3 step all the way out of regulation start out of blocks (timing start with back foot leaving the blocks and stops at the touch down after hurdle number 12) take 0.5 second out to predict competition time "Gary Winkler". So if a woman total time over the 12 hurdles drill is 14.30 sec that means this woman is capable of running 13.80 sec in competition.
  - **For Men 110m Hurdles:** 12 hurdles @ 99cm x 8.8m between x 3 step all the way out of regulation start out of blocks (timing start with back foot leaving the blocks and stops at the touch down after hurdle number 12) Total time of the drill is potentially is what they can do in competition. "Karim Abdel Wahab". So if a Man total time over the 12 hurdles drill is 13.80 sec that means this man is capable of running 13.80 sec in competition.

Main hurdle workout day two:

A- 1 set x 2 reps x 5 hurdles x 3 step pattern x trail leg x 8.5m/99cm for men and 7.9m/76cm for women.

B- 1 set x 2 reps x 8, 5,5,3,3 x 11.65m/8.35m/76cm for women and 12.65m/8.95m/99cm for men.

C- Hurdle volume can be reduced today if flat max velocity work needs to be done.

Notes:

1. Frequency and volume of hurdle w-up drills are reduced.
2. Hurdles strength endurance work using A runs is no longer utilized starting this training phase.

Below for examples of 12 and 9 hurdle rhythmic variation ↓

	# of strides	Start	H1	H2	H3	H4	H5	H6	H7	H8	H9
Women		8	3	3	5	3	5	3	5	3	
	btwn	13.0	8.2	8.2	11.47	8.2	11.47	8.2	11.47	8.2	
Men		8	3	3	5	3	5	3	5	3	
	btwn	13.72	8.8	8.8	12.47	8.8	12.47	8.8	12.47	8.8	

Women

8	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12
3	3	3	3	3	3	3	3	3	3	3	3	
13.0	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	

Men

8	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12
3	3	3	3	3	3	3	3	3	3	3	3	
13.7	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	

Women

8	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12
3	3	3	3	3	5	3	3	3	3	3	3	
13.0	8.2	8.2	8.2	8.2	11.47	8.2	8.2	8.2	8.2	8.2	8.2	

Men

8	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12
3	3	3	3	3	5	3	3	3	3	3	3	
13.7	8.8	8.8	8.8	8.8	12.47	8.8	8.8	8.8	8.8	8.8	8.8	

Below is the summery of the whole training plan with all progressions for men and women high hurdles

Reps	*Start Pos.*	*Pattern*	*Ht/Spacing* *Men*	*Women*
Fall A (3-4 weeks) Skill Development 1				
3-4 x 3H-5H	Stand	5 steps	39"/11.4m	20"/10.4m
3-4 x 3H-5H	Stand	3 steps	39"/7.9m	20"/7.3m
Fall B (3-4 weeks) Skill Development 2				
3-4 x 5H	Stand	3/5	39"/11.4 & 8.2m	24"/10.4 & 7.6m
3-4 x 5H	stand	3 steps	39"/11.4 & 8.2m	24"/10.4 & 7.6m
Fall C (4 weeks) Acceleration development "Power leg development"				
Day 1				
4-5H: 2 x side, 2 x middle	Stand	1 step	36"/3.5-4m	24"/3-3.5m)
2-4 x 5H, 5-step start *M 9m, W 8m*	Stand	3 steps	39"/8.5m	24"/7.67.9m
2 x 5H	Blocks	3 steps	39"/8.5m	24"/7.9m
Day 2				
1-2 sets of 2-4 x 5H	Stand	5 steps	39"/12.2m	28"/11.20m
Fall D (4 Weeks) Acceleration Development and indoor pre-competition preparation				
Day 1				
6-7H: 2xside, 2xmiddle	Stand	1 step	39"/3.5-4 m	30"/3-3.5 m
2-3 x 5H, 5-step start 9m & 8m	Stand	3-3-5-3	39"/8.5 & 11.93m	30"/7.6, 7.9 & 10.9m
2 x 4-5H	Blocks	3 steps	39"/8.8m	30"/8.2m
Day 2				
2-3 x 5H with 10-12 step start 2-3 x 5H with 8 step start	Stand Stand	5 steps 5 steps	39"/12.5m 39-42"/12.5m	30"/11.5m 30-33"/11.5m

Reps	*Start Pos.*	*Pattern*	*Ht/Spacing* *Men*	*Women*
Indoor (8 weeks) Max velocity over hurdles and race preparation				
Day 1				
2-3 x 5-7H: Wt. Vest & 5 step Start	Stand	3/5	8.5, 8.8 & 12.5	30"/7.3, 7.6, 7.9/11.5
1-2 x 2-3H Competition Start	Blocks	3 steps	39"/8.8m	30"/8.2m
Day 2				
2x5H, trail leg only	Stand	3 steps	39"/8.5m	30"/7.9m
2x5H	Blocks	5-5-3-3	39"/12.5 & 8.8m	30"/11.5 & 8.2m
Outdoor (10-14 weeks) Specific Rhythmic endurance development				
Day 1				
1 x Starts over 1, 2 & 3H	Blocks	3 steps	39-42"/8.8m	30-33"/8.2m
2-3 x 12H OR	Blocks	3 steps	39"/8.8m	30"/8.2
2-3 x 9H	Blocks	3/5	39"/8.8 & 12.5m	30"/8.2 & 11.5m
Day 2				
2x5H, trail leg only	Stand	3 steps	39"/8.5m	30"/7.9m
2x5H	Blocks	5-5-3-3	39"/12.65m & 8.97	30"/11.65 & 8.35m