

Insights to Jamaican Sprinting Success

Stephen Francis & Glen Mills Training Philosophy

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Introduction

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About this Report

By 2009, if there were 2 coaches in Jamaican Sprinting that comes to mind, it's Stephen Francis and Glenn Mills. Athletes such as Asafa Powell or Usain Bolt are now household names, thanks to them. But it doesn't stop there. They have success in the women's sprints, as well as hurdles. So it's more than just getting lucky with 2 freak athletes.

So what's their secret? If you want to run fast, you can either innovate, or imitate!

This report will attempt to show some insight on what they do, and most importantly, why.

A coach is measured by results, not by knowledge. So please read carefully and apply their knowledge to your training program.

About the Author



Jimson Lee

Jimson Lee is a Coach, Masters Athlete and founder of the Blog SpeedEndurance.com which received over 1.5 million visits in 2010.

SpeedEndurance.com articles have been quoted in **ESPN, BBC, NY Times, Yahoo Sports, Sports Illustrated, Yahoo's College Football, San Jose Examiner, and Wikipedia.org.**

The articles were also referenced in the printed edition of **ESPN Magazine** and **The Globe and Mail**, Canada's National newspaper.

Zen Habits ranks SpeedEndurance.com as one of the 20-plus Amazing Fitness Blogs to Inspire You.

Stephen Francis Training Philosophy

Long to short, or Short to long program?

This is the classic question for sprint coaches. A Long to Short approach is using high volume and over distance training at slower speeds early in the season. As the season progresses, you get into more specific, faster running at shorter distances.

A Short to Long approach starts on day 1 as you start acceleration development from week 1. Elite athletes will typically start this in October and sometimes November. These athletes will do well with 60 meter indoor competitions in the winter.

Francis' training plan is a high volume, short recovery leading on to lower volume and longer recovery as the season progresses. He doesn't do much low intensity work as he "read in a book" a while back that to run longer than 20 minutes will affect your speed. Thus his longest run for conditioning is 20 minutes.

So to answer the question, Francis training plan is a long to short approach with short to long in it. That is, the short 30 meter sprint is there all year long.

While a lot of traditional coaches train their athletes hard 3 days a week, training hard 4 days a week does present its challenges. Francis believes you can work hard on successive days if you are working different energy systems. For example, short sprints to 30m one day, and then speed endurance the next day. This makes sense as the CNS requirements for speed endurance is not as high as in short speed work.

One of the unique training weeks in the macrocycle is Francis' group does 15 sessions in a week, because he "read a book" by Frank Dick a while back that said you need 15 sessions/week. This volume and stimulus is more important than any theory about CNS and its recovery. It works for his group. (see a typical training week below)

In terms of training women, they do the same workouts with 20% less volume than the men.

As a group, the youngest athlete is 17 years old.

GPP Setup and Periodization

If you think Jamaica is a party town, think again. At least not for MVP (Francis' Track Club). Francis' group AM workouts start at 5am. That's not a typo. The reason is to control the nighttime activities (i.e. parties) of athletes. With a 5am start, you are in bed pretty early! Or you will be in a land of hurt.

His macrocycle is a typical 3 week hard and 1 week easy where the easy week is a testing week.

Regarding Periodization, it depends on several factors such as the climate and facilities. Francis' group has 1 long peak from April to September. He doesn't believe it is possible to peak for indoors and then peak again for Jamaica Trials in June.

So GPP (General Preparation & Planning) is 4 months long, starting in September but the professional athletes start in late October or sometimes even November. This phase will go till March and will involve (at a high level... detailed plan to follow later in this article):

- Hill sprints: Twice a week
- Weights: 4 times a week

Only after March, he introduces speed endurance.

For more info on Peaking, Planning and Periodization, see:

<http://speedendurance.com/2009/06/28/peaking-planning-and-periodization/>

Training Specifics (on Sleds, Sand, Overspeed, Hills and Spilt Runs)

So what does Francis do to improve the acceleration development in the first 30 meters of a 100m sprinter?

Basically, they do sled work for 6 months. In terms of weights, he uses up to 50 lbs or 23 kg for men and 25 lbs or 11 kg for women. Asafa Powell can run 2.86s for 20m in flats, and 3.45s with a 50 lb sled!

This is on contrast to some coaches who like to use a maximum of 10% of their body weight.

As far as sand runs goes, you would think it would be extremely popular having Jamaica as a year round training camp! However, he doesn't like sand runs for two reasons. One is their training center is an hour away from the beach. The other is sand runs stress the quadriceps too much.

Another training method Francis doesn't like is overspeed training as the chance of injury is too high!

If you want more information on overspeed training, see:

<http://speedendurance.com/2009/01/27/overspeed-training-controversy-good-or-bad/>

The reason is the athlete loses too much control at the higher velocities. Staying healthy is the number one priority. Even sprinting 60 meters is risky as the 50-60m segment traditionally has a high chance for athlete to pull up. (more on alternatives to 60m training later)

The hill session that Francis describes is an extremely steep incline at near 45 degrees for the first part of the hill, then it levels off slightly. The total distance is 150 meters, and they do repeats with a walk back down the hill in approximately 5 minutes.

For Sherone Simpson, her PB for 150 meters on the track is 15.8 but runs the hills in about 22 seconds. (That must be one steep hill!)

And finally, he likes to avoid split runs (i.e. 200m + 200m) but he will use it sometimes if a sprinter is lazy on a single rep.

On Training

Francis doesn't have anyone in his group go all-out with their top-speed in training. Not even in his short 30 meter runs. All runs must be controlled.

As mentioned above, he does 30 meter runs from Day 1, along with sleds, hills, plyometrics and weight training.

While he does short speed from day 1, his long to short training workouts include medium intensity "intensive tempo" program such as 5x300m with 10min rest at 38-39 seconds on a 300m (2-turn) grass track.

Jamaica loves their 300 meters, and even up to the last week or two before a major championship, he makes his athletes run a 300m or 250m in practice. Asafa Powell has run 32.8 on a grass track with flats!

Why 300m?

Just like the 40 yard dash in American football, the 300m is a must. Because the 300m is traditional in Jamaica, your 300m time is equally important as your 150m time.

In 2011, according to Glen Mills, Yohan Blake ran "30 point something" seconds for the 300m in training before his 19.26 PR for the 200 meters, which is just outside the world record.

Francis really dislikes the 60m in practice. His main work is 30 meters, but he will get up to 2 x 50m. But never 60m, because he's seen too much damage a 60m based on experience. For speed endurance, he does 80, 90 and 100s, but that's because the speed is slower.

A Typical Training Week:

His team does all running in flats until February. Classic workouts include:

- 8x300m with 5 min rest
- 12x200m with 3 min rest

These workouts are performed twice a week.

Like most traditional coaches, his 300's are his favorite workout and should be done every week. First, it helps your technique as you will learn to run efficiently over repeat 300's. If you have bad form, trust me, you will learn to correct it real fast. The other reason for this workout is to develop a resistance to pain.

For short sprints, there are 2 sessions a week, which include starting blocks and correcting biomechanics, sled work, sled work from blocks for distances between 20 and 30m.

He's also a firm believer in circuit training one day week, which goes on until December.

So here is a sample weekly training schedule:

Mondays

5am

- Hill sprints to 40m
- Stretching
- Ab work

3pm

- Weights
- Plyometrics

Tuesday

5am

- Long speed endurance
- 400's, 350's or 300's
- (or 800's, 600's, 500's for 400m athletes). No more than 6 reps done here.
- Ab work
- Med Ball

3pm

- Technique work (mainly drills and some form runs)

Wednesday

5am

- Long hills
- 250m, 200m or 150m
- (300m for 400m athletes). No more than 8 reps done here.

3pm

- Weights

Thursday

5am

- Circuit training (bodyweight exercises - burpees, press ups etc)
- Drills for endurance
- Med Ball

3pm

- Technique work (mainly drills and some form runs)

Friday

5am

- Sled work
- Stretching
- Ab work

3pm

- Weights
- Plyos

Saturday

5am

- Weights
- Slow speed endurance or intensive tempo such as 200's

3pm

- Rest

Sunday

- Rest

Weight Training and Drills

Francis prefers weight training with mostly free weights and very little machines. That's because he believes the training should closely resemble the sprinting action as possible, therefore he goes with split squats, single-leg deadlifts, lunges, steps up, one-legged squats and all that "one-legged stuff".

There is one caveat: NO TRADITIONAL SQUATTING!

But if he is going to do squats, it will be a front squat, so the weight can be thrown forward in case of emergency. Variations include jump squats and split jumps.

He prefers to do weights before a sprint session (i.e. see a typical Saturday workout above)

They even do lots of cleans, mostly from the hand position. They do not do the full clean and jerk nor the snatch.

Core work is done 3 times a week with a large amount of ab work is done with a medicine ball.

He likes the bench press because it strengthens your hands and arms to hold you up in the SET position.

What is particular about the choice of weight exercises is he like not focus on the back of the body, that is from the heel all the way up the lumbar part of the lower back, as these are the muscles most involved in sprinting.

He believes sprinting is very stressful on the hamstrings. Thus, he'll perform hamstring work 4-5 times a week as he claims that area works 3 times more than the front. If you take a look at his record at MVP, it's rare to see an athlete get seriously injured from a hamstring pull.

Another exercise of importance is doing hip extension exercises, such as straight leg pulley hip extension.

As you can see, he really doesn't focus on the quads!

His take on drills is to strengthen the specific muscles, rather than to improve form by use of cues. For example, he will use high knees and straight leg bounds for specific strength. Typical distances are high knees for 100-150 meters to develop hip flexors.

You have to understand what the body does in sprinting and then develop those muscles.

Testing Week, Easy Weeks

He splits up his group of about 80 athletes into 5 groups, similar to an European Soccer League. When an athlete from the lowest group demonstrates he or she is superior to the others in that group, Francis moves them up from the 5th group to the 4th group. Of course, everyone wants to be in the fastest group with Asafa Powell and other professional athletes.

Every 4 weeks, there is a light or rest week used for testing comprising of 2 tests per day with 4 exercises per day, 2 in the morning and 2 in the afternoon. These tests will start in the fall and usually end in April.

Other variations include a protocol of 15-18 tests with 3 tests a day on testing week.

Francis doesn't believe in max strength testing because he learnt that lesson in 2008 with Asafa Powell tearing his pectoral muscle. Thus he prefers to use the same NFL tests protocols used in the NFL combine.

For example, he tests for the maximum repetitions for a certain weight, such as 175lbs or 80kg in the bench for men and 110lbs or 50kg for women.

The shortest number of reps in the weight room test is testing for 6 sets x 4 reps

On the running side, he might do a 12 min run on Monday morning and Standing Long Jump or Vertical Jump in the afternoon. Another test is a 1000m time trial one day (yes, even for sprinters!) and then the next day he will test the 800m. Over time, he decreases the distances with a 400m one day and a 300m on the next day.

He jokes how the "slow twitch aerobic guys" will win these tests early in the season which is a huge ego boost, but towards the end of the season when it really matters, they aren't the ones winning the shorter sprint distances.

There is a correlation of power and speed. See:

<http://speedendurance.com/2011/02/24/100-meters-elastic-power-and-strength-test-correlation/>

http://www.trackandfieldnews.com/technique/109-Frank_Dick.pdf (PDF document)

Francis includes tests using a med ball throw including overhead backward and forward throws, or jump, jump throw, and several other variations.

An example of goals is male sprinters should be able to Standing Long Jump 2.90 meters (9 feet 6 inches), but surprising he doesn't have anyone who can SLJ over 3.00 meters. For woman, the goal is 2.50 meters or 8 feet 2 inches.

Click here for information on the [Freelap Timing System](#).

Why the 400m early in the Season?

We've seen several world class sprinters like Tyson Gay, Marion Jones and even Usain Bolt run the 400 meters early in the season. Coaches will say it's to "work on their strength" and with a long to short program and the over-distance work, it's not a shock to the system. Francis' 100 meter sprinters typically do 38 seconds for 300 meters, and his 400m sprinters do 1m31s for 600m in training.

For Francis' group, they train in flats on a 370 meter grass track. So with the Jamaican high school season going from Jan 1 until March 31, sprinters can start their racing season with 400 meters.

Q. Why do you have your athletes running the 400m early on in their competitive program?

Changes in January, and Training on the track

Francis' group introduces training on a synthetic Mondo surface starting March 1, along with grass surfaces. The reason for this is to run fast times at the Penn Relays in late April and keep their sponsors happy.

Here are some of his changes starting January 1(from the above weekly schedule):

- Monday becomes speed endurance
- Tuesday and Thursday becomes sled work
- Saturday is long hills if they are not competing
- No change for Wednesday and Friday

Competition, Peaking and Taper

Francis doesn't believe tapering does much, other than decreasing the volume by 30% the last 10 days before a major competition. Being well rested is the key.

He also doesn't believe in the indoor season and he'll never change a program to accommodate indoor season.

As far as peaking goes, it's really one long peak from May until August. Asafa Powell is known to run World Records in June as well as September (9.77 twice in June 2005 and 2006, and 9.74 in September 2007).

Sherone Simpson ran 11.11 in January and 11.03 in August for the 100 meters. As long as one keeps the specifics in the program they'll perform well.

One of his main motivators is to beat the Americans (this was back in 2008) but today, we know several Caribbean countries are producing world class sprinters and thus are also a threat.

Training Mentors and Support Staff

As far as mentors go, Herb McKinley is probably the biggest influence in Jamaica. It's also interesting to note that Francis' ex-coach is Dennis Johnson, who was coached by Bud Winter.

See: <http://www.budwinter.com/books/>

He also gives credit to John Smith and Trevor Graham.

Everyone should learn and keep learning and ask themselves "what if I am wrong?", or "what if there is a better way to do it?". Ask questions. Trust no one.

For a support system of about 80 athletes, he has 4 assistant coaches and 4 massage therapists. Thus having a great support staff really helps.

On Hurdles

(see his guide to the 100m hurdles later in this report on Page 27)

It's no surprise that his hurdlers also do sprints. He has them sprinting the late part of the preparation period, as well as the early part of the competition period. They will do a couple of 400's and 100's and then they focus purely on the hurdles.

He believes a successful women's short hurdler must be able to sprint with a high turnover and frequency, especially with only 3 strides in-between hurdles. Those who can over ground the fastest in these 3 steps will do well.

He doesn't believe in a predetermined stride pattern for the 400m hurdles, as hurdlers must get familiar with the spacing first and judge where you are as you approach the hurdle. Other factors such as wind play a major role.

Glen Mills Training Philosophy

Bud Winter went to Jamaica for a series of seminars back in 1966. In attendance was a young man from Kingston named Glen Mills would later become Usain Bolt's coach after the 2004 Athens Olympics, and the rest is history with Bolt's 9.69 at the 2008 Beijing Olympics.

Glen Mills is a big believer in Bud Winter training methods, especially the relaxation part.

See: <http://www.budwinter.com/books/>

For starters, we all read the same books from former great coaches.

Success at the track comes from "how we use this knowledge in the circumstances we're in".

It is important to be specific to each athlete's needs, as they have various strengths and weaknesses, so treat each of them differently.

Developing technical skills from early age is the first requirement. Sprinting is a precision event, and every movement is crucial. One negative area will have a serious overall impact. When you consider a typical 100m sprinter takes 46 strides (Usain Bolt takes 43 strides), a one inch difference will result in 46 inches or nearly 4 feet!

Glen Mills trains short to long, which means speedwork from Day 1 and that includes a variety of mechanical drills, starting drills and games involving reaction time. This means no high volume, high mileage training methods as in a long to short program.

One of the things Mills stresses is how analyzing where the problem lies. If you have an athlete with a poor 100 meter time, look at the start, drive phase, acceleration to top speed, maintenance of maximum velocity and deceleration. If the problem lies in the max velocity phase, then you can prescribe more speed endurance for that one athlete.

We know Usain Bolt's success is from his longer stride from longer legs and turnover. This is a direct



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result of applying more force to the ground during ground contact time. But it's more than that. He believes in training the body and the mind. You must feel everything you do in your workouts via proprioception. And that includes every drill, every stretch and every movement. No iPhones or iPods or any other interruptions, just focus! Thus staying focused and un-interrupted in the mind and you'll exert more force. (Read Bud Winter's [Relax and Win](#))

Speaking of force, Mills believes in weight training in addition of plyometrics and body weight exercises. Fast twitch muscle fibers will age over time. Kim Collins and Carl Lewis are rare exceptions with longevity without doing weight training exercises.

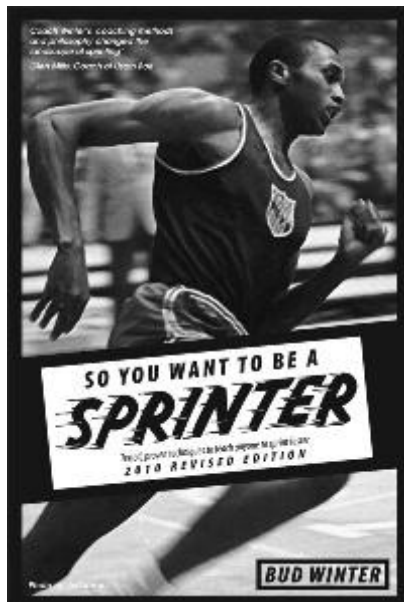
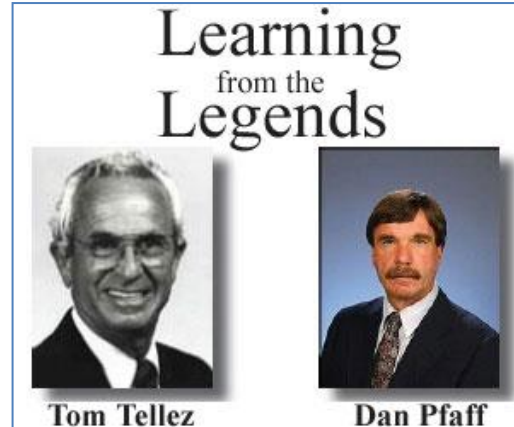
He performs tests on his athletes every 8 weeks as opposed to Stephen Francis' 4 weeks.

In terms of overspeed training, it is done on a gentle slope. He also dislikes the use of parachutes as they fly all over the place.

For more information on overspeed training, go to:

<http://speedendurance.com/2009/01/27/overspeed-training-controversy-good-or-bad/>

Recommended Resources



- [Complete Speed Training 2](#)

A complete resource for track & field athletes, coaches and parents. Over **9 hours of video totaling 11 DVDs and manual** delivered directly to your door

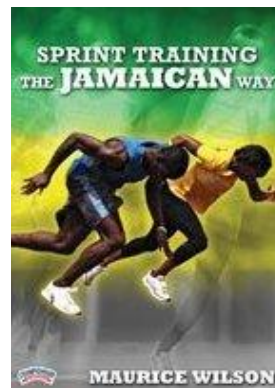
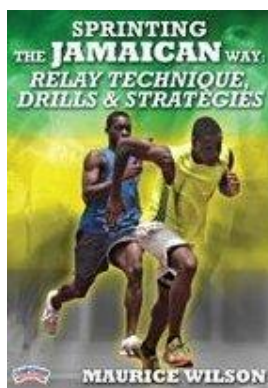
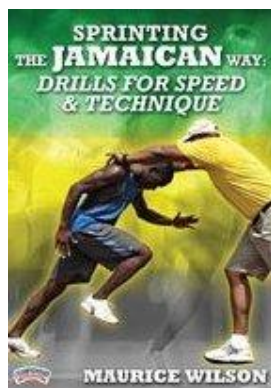
- [Track and Field Legends.com](#)

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- www.budwinter.com/books/

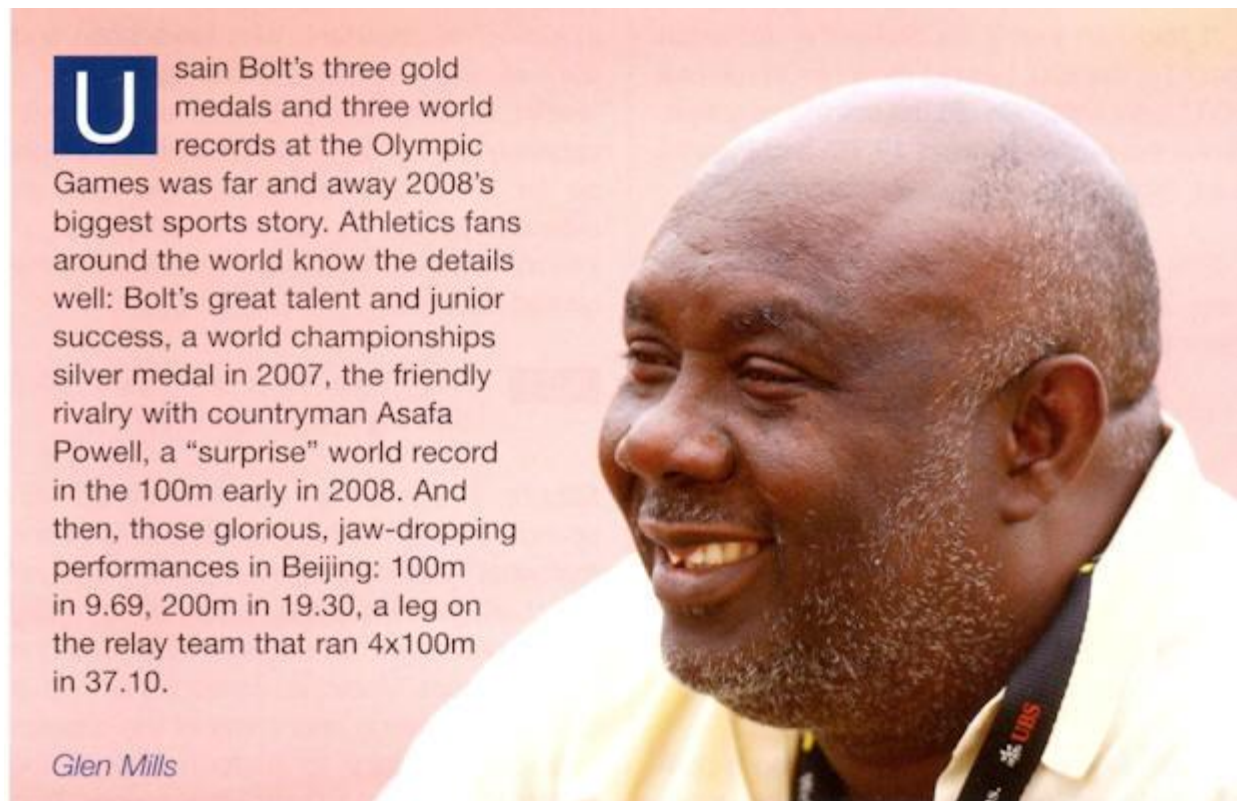
This 2010 revised edition is the original landmark book from 1956 & 1973. Includes 8 essential drills for proper sprint form, full detailed training plans, and much more!

- Sprinting the Jamaican Way: The Maurice Wilson DVD Collection
[Sprinting the Jamaican Way](#), [Drills for Speed & Technique](#), and [Relay Technique Drills & Strategies](#), available at Amazon.com



IAAF New Studies in Athletics Interview with Glen Mills*

*Reprinted from the IAAF New Studies in Athletics, January 2009



Thanks to those races, a surname right out of a Hollywood scriptwriter's textbook and the general application of good-natured showmanship before, after and even during his races, Bolt is also known to just about every kid who has access to a playground, television or YouTube. Has the sport ever had a bigger star? Has it ever had a better opportunity to draw in youngsters?

Gradually, the world is also learning about the "not as easy as it looks" back-story to the Bolt phenomenon: the hotbed of sprinting talent that is the Caribbean, his personal determination and dedication, his link with the IMF High Performance Training Centre (HPTC) at Kingston's University of

Technology in Jamaica, and the patient expertise of veteran coach Glen Mills, who has guided his career since 2004.

The credentials and reputation of Mills, who, incredibly, has been coaching since the age of 14, were already well established before he hooked up with Bolt. His coaching education included courses staged by the IMF Regional Development Centre in Puerto Rico and the International Olympic Committee. He has led Jamaican teams to international competitions, coached a number of top sprinters from the Caribbean, including 1987 world championships 100m silver medalist Ray Stewart (JAM) and 2003 world 100m champion Kim Collins (SKN), and he is currently the main coach at the IMF HPTC in Kingston.

But with the success of Beijing, Mills' own story is becoming more widely known and recognition has followed. Among his most recent awards was the "Coach of the Year" presented by his colleagues in the North American, Central American and Caribbean Track and Field Coaches Association (NACACTFCA) in October 2008.

Insight into Mills' thorough approach and his relationship with Bolt is provided by his story of how in 2007 he wanted Bolt to train for the 400m in order to better prepare for his pet-event, the 200m. According to Mills, Bolt, wanted to change his focus to the 100m.

"I told him that if he broke the Jamaican record in the 200, I would allow him to run one 100," says Mills. "He did the training as asked, broke the record (running 19.75) and then he said: 'You've got to keep your promise'."

Bolt ran his first professional 100m that year, clocking 10.03 seconds. "After that there was no stopping him," Mills said.

To learn more about his methods and thinking, NSA sent the Director of the ROC San Juan, Lenford Levy, to speak with Mills in his Kingston office.

NSA: When did you discover that coaching was "your" profession?

MILLS: Some 40 years ago. I found a passion for coaching and have worked on developing myself, becoming more educated and qualified, from that time until now. My substantive post or profession is that of Sports Administrator. I have worked here at the Institute of Sports for over 20 years. Coaching is the other half of my life where I enjoy coaching track and field after work and sometime during work time.

NSA: As you have obtained formal coaching qualifications, how do you judge the usefulness of such programmes for your work now? What recommendations would you make for improving them?

MILLS: I did several courses with the IMF at the ROC in Puerto Rico and with the IAC. These were very informative. One that really stands out is a course I did in Mexico. It was held over an extended period of two months, after which I received a Diploma. It was conducted by a number of professors, mainly from the former Eastern Bloc countries, who really went into great depth about the event specifics and the supporting sciences.

I have not been on an IMF CECS course recently. However I have spoken to coaches, including my assistant, who have been and they all seem to have come away with a wealth of information. Based on my own experiences, my only recommendation would be for these courses to be held

over an extended period, so that the coaches can go into more depth in the event specifics and the related sciences.

NSA: How have you developed your coaching eye for sprinting?

MILLS: I have always been fascinated with speed, running mechanics and so on. I think that what I learned in Mexico about the physical characteristics of the human being, agility and coordination has helped. There was one unit on Sports Medicine, where we looked at talent identification and some of the characteristics necessary to perform well in the sprints in comparison with other events. That knowledge, which included biomechanical analysis of the movement of top-class runners, has guided me over the years. I personally believe that a coaching eye is part of a gift that is unique to a person. Over the years I have been able to use that, along with knowledge gained from courses, books, etcetera, to identify athletes I think will go far in sprinting. It's probably difficult to relate outside of the scientific principles, but one has to approach it with an open mind because you could lose a good sprinter or athlete because he does not fall within the norm --- you sometimes have to think outside the box.

NSA: In Usain Bolt you are training the most successful sprinter for years. How have you evaluated his technique?

MILLS: Usain is an extremely gifted athlete. When I started working with him, one of the things that stood out like a sore thumb was his poor mechanics. He was running behind the centre of balance. This resulted in a negative force against his forward drive and it was affecting other areas. For example, his body position put pressure on his lower back and there was a continual shift of his hip girdle and a pull on his hamstring. He was continually having hamstring problems and my assessment was that one of the things that contributed to it was his poor mechanics. Our first task was

to get him to run with his upper body core in line with his centre of mass or a forward lean of somewhere around 5-10°. We set about doing drills then we took videos of his workouts and broke them down on the screen in slow motion to show him exactly what he was doing. I would draw diagrams and show him the position that we are working to achieve. Part of his poor mechanics was because he was not able hold the sprint position during maximum velocity running, so we had to do an intense programme to develop his core strength. In Beijing he showed a mastery of the technique that we had been working on, but the transformation took two years. Athletes tend to reverse to their old habits when put under pressure or when running at maximum velocity. Like helping an actor learning a part, coaches have to continuously react and replay and redo the drills, getting the athlete to run over and over in order to break habits, both psychologically and physically, and get into the right running technique.

NSA: Can you briefly describe the most important elements of a good sprinting technique? We know that body position, ground contact phases, recovery mechanics and arm action all have to work together, so do you have a specific model in your mind?

MILLS: All the points I just mentioned are the foundation of developing sprint technique, but the key is how you get that athlete to execute all of them accurately. He or she could be doing all, or most, or just some, but without perfect co-ordination or timing in the execution. One key is to establish a good body position in sprinting so that the athlete is able to maintain the stride length and keep ground contact or ground time short after having achieved maximum velocity. Here we believe that the development of the hip flexor to coincide with the strong upper body, or core, plays a great part. Once the athlete's stride length reduces, everything is going to be negative or impact negatively in the ground contact and

recovery mechanics. A collapse in technique and poor execution will then lead to a rapid deceleration process and a disappointing overall performance.

NSA: To what extent must an athlete's technique adapt to the different phases of the race?

MILLS: The techniques for starting, for the drive phase, for the transition from the drive phase to acceleration, for maintaining top speed and then for reducing the effects of deceleration are different. The athlete must be able to adjust the technique to the different phases without loss of time. If, for example, when the athlete switches coming out of the drive phase into the acceleration phase and the technique is not correct he can lose significant momentum. Even if he was in a striking position during the drive phase, you will see the field leave him and then he will have to spend time to develop the momentum to get back to top speed and into the race. In the 100m, athletes usually run out of time when something like this happens.

NSA: How do you distinguish between the different race phases? What is their approximate ratio?

MILLS: I approach it according to the individual. The athlete himself and his strengths and weaknesses determine the length of the different phases. For instance, the length of the drive phase is affected by how much strength the athlete has to stay in the crouch position while developing maximum power. If the athlete does not have the strength to carry the drive phase long enough then it has to be aborted so he can go into the transition earlier. If he is strong, like an Asafa Powell, and has an effective technique, he can carry this phase very long. I adjust the phases to suit the athlete's strong and weak points, whether he is an explosive runner from the blocks or one with better top-end speed. If, for example, you were to say that the drive phase is 25m and stick to it then you would have problems with an

athlete who may have a variation. Certainly an athlete with good top end speed can use a shorter drive phase, because the chances are he develops top speed later and will be able to maintain maximum velocity longer in the last third of the race than the explosive starter. Of course, if the athlete has deficiencies in various areas then you have to correct them while you adjust the race phases, but you cannot adapt him to a phase that he is not able to execute.

NSA: How do anthropometrics influence the technique?

MILLS: Every athlete has a natural pace, so you start with his natural pace and look at the deficiencies that exist. For example, stride length. If an athlete has the necessary reach in terms of physical structure, say someone who is six feet (1.83m) tall but is taking strides that are shorter than he should, I try to analyze what are the areas that are contributing to the situation. It is usually the strength of the various muscles that carry out the movements and therefore we must work, especially in the off-season, to change the athlete: 1) to develop the strength needed and 2) to improve the stride pattern with specific exercises. For example, we determine the athlete's natural stride and then we use markers to set out stride length. In each exercise we lengthen the marker in a very moderate way, maybe by half inch to one inch. The athlete executes the run trying to extend the stride length to meet the markers. However, he must ensure that he is not over-striding to meet the marker, hence he has to get his knee to the required height, the heel recovery must be correct, etc. Once athletes start doing that correctly, they tend to open up more and execute a longer stride length. They will be able to maintain maximum velocity, without over striding. We have found that if we can extend the stride length and maintain the correct velocity it will improve the time significantly. We also try to develop the athlete both mentally and physically to be aware of maintaining

their stride length even when fatigued, especially in the 200m. You can only carry top speed for maybe 50-60m, but how you maintain the stride length will determine your overall time.

NSA: Do you think that tall sprinters have an advantage? What would you recommend in order to adapt technique and race distribution to the given anthropometrics?

MILLS: They only have an advantage if they can master the technique and the different stages. With sprinters who are explosive, their advantage comes in the first half of the race; the taller sprinters tend to be at a disadvantage in the first half of the race. If a shorter sprinter is able to maximize his\her stride length in the second half it is difficult for them to be beaten. However, most of them tend to tighten up in the maximum velocity phase or once they feel the presence of a taller sprinter. This is why athletes who have good top end speed win most 100m races. There is a balance between the tall and the short, but a lot of it is lost, especially for the short sprinters, in the psychological preparation that tends to affect them in the competition itself. The distribution is also important because if the athlete achieves maximum velocity too early it increases the period of deceleration. The aim for the explosive sprinter is to distribute their early acceleration so that they reach maximum velocity later in the race, without sacrificing the advantage of being explosive at the start. Working with the athlete on a one on one basis, the coach with his experience and constant study of the athlete and his or her race pattern would determine the optimum point at which he would want the athlete to achieve maximum velocity. He then works to see how long that athlete can maintain that velocity. That would significantly help the athlete in terms of adjustment and adaptation to running the 100m or 200m, because if the curve is too steep then it is going to keep coming down on the deceleration phase.

NSA: What type of strength training do you see as important for the 100m and 200m?

MILLS: Strength is one of the hallmarks in sprinting and therefore it must be developed. However, I believe that there are two types of strength: the static and the dynamic strength. I think athletes tend to depend too much on the static strength and that dynamic strength is one of the greatest areas of deficiency in most runners. They are all bulked up and big and powerful from the weight room, but they neglect the dynamic strength, that is the strength developed in resistance training, plyometrics and so on. We find with our sprinters that we get far better result when we almost have a fifty - fifty split between static and dynamic strength training.

NSA: How do you manage to keep the balance between speed endurance and pure speed work, so that the athlete is fresh and explosive?

MILLS: Speed endurance and pure speed have to work hand in hand. People tend to separate them and do speed endurance as a single component and then do explosive speed training as a single component. A lot of time we hear sprinters say that they have not started speed work yet, which means that they have been doing speed endurance work. My philosophy is that the two should run concurrently and that coaches should try to develop a balance. To keep the athlete fresh and explosive, the load has to be slightly reduced as you go to high velocity and high quality performance in training, the work that is done in the last part of the competitive period leading up to the major completion. A greater degree of rest is required for recovery and explosive training must be greatly reduced to maybe once or twice per week and a recovery should not be less than 36 hours, 48 hours would be even better. A lot of coaches feel that if you

reduce the workload too much in terms of training time the athlete will lose something, but that is not my experience.

NSA: Successful sprinting is very much dependent on the right motivation. How do you motivate your athletes? To what extent do you involve them in specific coaching decisions?

MILLS: We treat motivation as one of the elements of training, so we train the mind concurrently with the body. I do a lot of talking in training on motivation individually and collectively, especially in between workloads, during recovery time. Short, quick words of inspiration, directive thought process, getting the athletes' minds to focus on what the goal is, pulling on their inner strength and so on. There is time allotted for motivation at the training site and within the training programme that lays the foundation for other motivational talks outside of the training. These are not only spoken to but are put into situations where the athlete's mettle and mental strength is tested, for example, we tend to look for the stiffest competition to face the strongest opponent --- our motto is that you have to "learn to lose in order to learn to win," When you lose you understand why you lose, you take it with grace and it does not defeat you, because you know that it is part of the process of winning. We believe if you are afraid to lose then you cannot win, because the subconscious is always going to be questioning your competence to win. You must be consciously able to confront it and use your positive approach to overcome it. Otherwise it will become the dominant factor in your subconscious and become a part of your consciousness. When fear becomes a part of your consciousness, you will find that you get extremely nervous and your neuromuscular system loses a high degree of energy, almost paralyzing the limbs, The quick impulses from the brain to the muscle are crucial for explosive sprinting. Once the brain becomes distracted by doubt and nervousness the impulses are not going to be as

positive and strong as they should be and this lends itself to subpar performances.

NSA: Can you give our readers some advice on 'Talent Recruitment' and what indicators to look for in an up and coming sprinter?

MILLS: First, look at the physical attributes of the athlete: physical structure, agility and coordination. Coaches should look for athletes who they as coaches can contribute more to their development rather than athletes who already have the physical development. Then look at the cadence. Sometimes the athletes in the middle positions of a race have superior cadence and are held back a little because the coordination is poor and they are not able to execute the stride pattern. In recruiting talent you cannot start at the top, you have to look beyond. I have spotted a lot of talent who finished down the track but are not yet developed. Some guy that finished last might have been the leader for the first 30m of the race. Nobody looks at him because he finished last. But his physical structure and the fact that he had the speed to be leading are factors that you cannot overlook. Question the athlete about his preparation: How long have you been training? How much training have you done? A youngster might say, *'sir I am only training a month, or a week'* while the winner of the race has been training for a whole season. You could take such an athlete and train him and see significant improvement. He may become a champion, Another thing to look for is the bounce. Look at the heel contact with the ground, people who tend to walk with less heel contact tend to possess a lot of speed and have a better mechanism for lifting their knees and recovery. This does not mean that a man that runs on his heels will not run fast, but it is something you can look for. Finally, look at the youngster to see if he is aggressive in his movements. These are some of the general things that can indicate talent.

Usain Bolt Stack Magazine Interview (September 1, 2008)

STACK magazine interviewed Usain Bolt after he broke the 100m world record at the Beijing Olympics. In this interview Usain imparts some very good advice, that we all could take notes from.

Original Source:

[http://magazine.stack.com/TheIssue/Article/6717/In the Weight Room With Usain Bolt.aspx](http://magazine.stack.com/TheIssue/Article/6717/In_the_Weight_Room_With_Usain_Bolt.aspx)

Here are some key points from that interview:

What is your warm-up routine?

We do stride-outs, not laps, to start. We usually do 10 to 15 stride-outs to get warm. Then we move onto some dynamic drills, stretching, then a few more drills. We finish with more strideouts.

What are you focusing on once you're in the starting blocks?

Instead of up, I try to focus on driving forward, keeping a straight back, driving from the hips, getting full extension and putting some arms into it. Make sure you don't focus on the guy next to you, because that can really throw you off. Another guy can be very quick out of the blocks, which can make you lose focus. You have to stay focused on what you are going to do and run your race at all times.

How do you execute the Drive Phase?

Hold and Transition. Make sure you hold your drive phase for 30 to 35 meters. Then you have to get the transition right so you don't come up too quickly. Come up gradually from the drive phase instead of popping up. That transition is so important, because it helps you get from your drive phase to full speed much easier. If you pop up and try to start running too soon, you really have to work to get to top speed. That transition takes about 15 meters, from 35 meters to about 50 meters.

Just like with the start, stay focused and don't think about the guy next to you. He may have gotten a fast start and might be out in front of you, but you can't panic and pop out of your drive phase. If you do, you'll lose your whole race plan—and the race is pretty much over.

When you are at full speed you are untouchable. How do you run so fast?

Relax and Execute. If you do your training, it should all be okay come race time. So, I get into the blocks, take a deep breath and just remind myself to get a good start, hold the drive phase, relax and execute. Your muscles get tight when you tense up; they start getting heavy and you begin losing speed. The more relaxed you are, the smoother and faster you'll run. Just focus on turnover and using your strides.

Any tips on nutrition?

I mix Gatorade with water and drink it consistently throughout the day. I've been doing this since I was young. When I'm feeling especially tired during training, I drink it straight to get a burst of energy. And after training, it really helps me recover from a hard workout.

Stephen Francis on the Women's 100m Hurdles Breaking 13.00 Seconds

*Presented at the 2004 NACACTFCA Congress in Bonaire

Women's 100 meter Hurdles:
BREAKING 13.00 SECONDS
A PRACTITIONER'S GUIDE

By Stephen Francis – Jamaica
(Presented at the 2004 NACACTFCA Congress in Bonaire)

Thirteen seconds has traditionally been an important barrier in the life of the developmental female hurdler. It sits at the crossroads. It is a sign that participation at the elite level of the event is possible. It indicates that the hurdler's dream is not far off.

By breaking 13.00 seconds, the hurdler shows potential to earn at the event in the near future. She is now a possibility for participation on the European circuit. She has achieved the "A" standard for the World Championships. She has met the "B" standard for the Olympic Games (the "A" standard was a ridiculously high 12.95 in 2004.)

What are the ingredients of a sub-13 hurdler? How does one go about transforming a 13.20 or slower hurdler to a sub-13.0 hurdler? I present to you today a guidebook for success. A set of proposals that when put together can transform a hurdler of reasonable talent to a near elite hurdler. The main chapters of the guidebook are:

1. Technique
2. Start and Acceleration
3. Speed
4. Speed Endurance

These should be the main areas of focus for the hurdler and her coach. Improvement in any of these areas will probably lead to improvement in the PB of the athlete. Improvement in all four will lead to huge gains.

SPEED DEVELOPMENT AND THE 100M HURDLES

Speed development is the most important aspect of 100 meters hurdles training. Many coaches see the women's 100 meters hurdles as a mirror of the men's meters meter hurdles, but in fact it is vastly different. In the men's event, because of the higher relative height of the hurdles, technique and height become more important considerations. In the women's hurdles the most important factor is speed. As a matter of fact, if one were to compare the techniques of the top women hurdlers against that of the top men, the women would come out very poorly. Most top women hurdlers have very poor knee drive to the hurdle on approach, an incomplete trail leg carry over the hurdle, and poor arm action during hurdling. Yet they manage to be among the very best in their event. Men do not have that luxury. The very best hurdlers are also the very best technicians in the event.

Looking at the 100 meters hurdles empirically, one will see that most top class hurdlers are almost guaranteed to be world class sprinters. To break 13.00 over 100 meters hurdles, the hurdler must be capable of running 11.75 seconds or better over 100 meters.

What is the implication of this for preparation? In general, the 100 meters hurdlers should train as if they were 100 meters sprinters for most of the training microcycle.

TECHNIQUE

Obviously, time must be spent refining the hurdling technique, but how much time?

And what specifically must the time be spent on? I propose that the focus of the coach and athlete should be in the following three areas:

1. The speed of the lead leg
2. The length of the trail leg
3. The positioning of the trail arm.

Deficiencies in the above three will be corrected by the use of drills. All of this is not new, and from my observation most coaches of hurdlers who I have seen spend quite a lot of time doing a myriad amount of drills of all types. For drills to be useful, each drill should be specifically aimed at developing one or more of the above facets.

Speed of the Lead Leg

As a general rule, the slower the lead leg, the more time spent over the hurdle, the slower the overall time of the race. How does one improve the speed of the lead leg? There are many drills devised that if done properly can lead to improvements in lead leg speed. The most effective are those that are done at racing speed. One of the problems that I am sure all of you encounter when coaching hurdlers is the difficulty that most hurdlers have when asked to replicate their drill form at racing speed. All of a sudden the hurdler with perfect form at the slower paces of the drill, look amateurish when asked to pick up speed, or to hurdle at maximum intensity.

For this reason, I advocate that a large amount of drill time should be spent on technique using a 3 step rhythm at near to racing speeds. The advantage to practicing the drill at low intensity is the possibility of the athlete teaming the perfect technique at a slower pace. When the athlete is doing the drills at walking or jogging pace she will have a lot of time to do the correct thing. The same holds true when the athlete practices hurdle clearances with 5 or more strides between the hurdles. In my view, however, it is better that the athlete learns the correct thing over a longer period of time in a way that she can easily reproduce in a race. This means that she will run a number of races with relatively poor technique, but over time as the technique develops and improves she will yield superior times. As she improves in practice, she will be able to do the same thing in races over the weekend. Although the technical improvement will be difficult to achieve in practice, the athlete will be able to apply some in her races.

The high intensity drills can be facilitated by setting up the hurdles with 6.5m to 7.0m between the hurdles, thus ensuring that the athlete can do the drill using a three step rhythm even though she is not going at full speed.

With these guidelines in mind, there are three drills, which in my experience may be the most effective ones.

1. Skipping lead leg snaps at the sides of the hurdles
2. Running lead leg half hurdle with one stride between the hurdles
3. Running lead leg snaps (half hurdle) with a three-step rhythm.

Only when the athlete is able to master these drills can you be confident that the athlete will be able to carry the technique into a race situation.

Trail Leg

The trail leg is probably the most important aspect of the hurdle technique. In fact for men, it is the most crucial part of the male sprint hurdle technique. It is not as important for female hurdlers because of the shorter distance between the hurdles. There is a caveat to this though. Smaller hurdlers, especially those 5'4" and less have to spend relatively more time on the functioning of the trail leg, for obvious reasons.

Why is the trail leg important? Well, it is the first of three strides between the hurdles. In fact, it is the second longest of the three strides in female hurdling. There are two distinct ways of carrying the trail leg. Smaller women have to by necessity carry the trail leg high and full - i.e. the knee of the trail leg passes close to the chest. Taller women can de-emphasize the height of the trail leg in deference to the quickness of the leg. These taller athletes tend to have longer strides between the hurdles, so they can carry the knee of the trail leg at just above waist height.

Carrying the trail leg high may be useful even for the taller woman. The high trail leg will ensure that the distance she has to cover over the next two strides will be less. She can then focus on making these two steps quicker than they would normally be when she carries the trail leg lower.

In general, the hurdler should try to avoid making ground contact with the trail leg too far from the center of the body. This is a very real possibility when the knee of the trail leg is carried at or below waist height over the hurdle. The trail leg then lands off to the side, and the hurdler is forced to over-stride to make the strides in between the hurdles. At the very least, the hurdler should improve her trail leg to the point where on landing, she can run normally between the hurdles.

The following drills can improve the trail leg.

1. Skipping trail leg over the half hurdle
2. Running trail leg over half hurdle with one stride between the hurdle
3. Running trail leg over half hurdle with three strides between the hurdles

Trail Arm

The main function of the trail arm is to maintain the balance of the body on landing. Most hurdlers (whether elite or not) tend to carry the trail arm very wide and high with a resulting twist of the body on landing. This twisting of the body fractionally delays the second stride between the hurdles, as the athlete must regain her balance before making the next step. This is something that male hurdlers are forced to perfect, because of the height of the hurdles. Twisting off of any of the hurdles can lead to disaster by the next hurdle. For the women, they are not air-borne as much, so the effect of twisting will not be as pronounced as it would be for the men.

I estimate that over a series of 10 hurdles, this type of delay can contribute a total of 0.3 seconds to the total time of the race. Ideally, the trail arm should be as close to the body as possible, especially the elbow and the upper part of the arm. The arm should also be carried as low as possible in an effort to counteract the natural twisting motion of the upper body. Drills for the trail arm are essentially the same as for the trail leg.

START AND ACCELERATION

As it is in any 100 meters sprint, the start is very important to the outcome of the race. The hurdler will take eight strides to the first hurdle, and during this time, she will have to get close to top running speed by the first hurdle. For the remainder of the race momentum is broken by the athlete having to clear the barriers, so the increase in speed later in the race is not as drastic as it is in the 100 meters.

The main issue with block clearance and starts for the 100 meters hurdles is that the block must be set so that the trail leg is in the front block. Although this seems to be basic, it does have a lot of implications for the approach to training, especially the training of acceleration. A lot of power work must be done on the trail leg. All starts must also be done using the trail leg in front. If the athlete also runs the 100 meters, then the 100 meters start must be adjusted to have the trail leg in front.

After the block clearance comes the acceleration, which begins at stride 2 and continues to the penultimate stride before the first hurdle, i.e. stride 7. Most hurdlers will begin looking at the hurdles immediately after block clearance. Others will concentrate in the first three strides on pushing against the ground without looking at the hurdles. Only after getting enough ground force will the athlete then focus on clearing the upcoming hurdle.

The athlete needs to focus on getting her hips high enough to negotiate the hurdle on takeoff. This is not as challenging as it is for the men's 110 meters hurdles as the hurdles are relatively lower. Several women hurdlers pay too much attention to the first hurdle and not enough to initial acceleration. Their body angles are usually wrong over the first four strides with the result that they get to the first hurdle at less than ideal speed.

The following exercises will develop block clearance and acceleration.

1. Jump, Jump, Throw with medicine ball
2. 6-8 x 30 meters steep hill sprints
3. 6-8 x 20 meters using bullet belt
4. Front shot throw on toe board
5. 6-8 x 20 meters using towel (or other types of resistance)

SPEED

As mentioned earlier, 100 meters speed is a good predictor of hurdling potential and ability. Training the speed component for the 100 meters hurdler is a little more complicated than training the speed component in the 100 meters. The coach has to take into account the presence of several barriers that have to be negotiated.

How does one develop the speed component? The athlete has to go through the same processes as the 100m speed development. All the various training regimens for developing maximum speed have to be employed including:

A. Maximum Strength Development.

This should cover at least 16-20 weeks of the training year. The focus should not be on the core bodybuilding exercises, but rather on exercises that are more specific to the running motion. As an example, it would probably be more beneficial for the athlete to do split squats and front squats instead of back squats. The front squat is more useful because the athlete can focus on the technique of squatting and not the weight she is squatting with. Split squats are even more relevant as they are done on single legs, like sprinting. Here balance and the minor muscles of the thigh come into play, just as it does in high speed sprinting. Other exercises would be:

- Cleans
- Jerks
- Hyperextensions (single and double leg)
- Jump squats
- Inverted Rows

These exercises should be eventually done in such a way as to develop maximum strength.

B. Jump Drills (plyometrics)

The aim of these categories of exercises is to develop the ability to exert more force from the ground each time the foot strikes. By improving this capability of the muscle, the athlete will be able to cover more ground with the same amount of ground contact time.

This area of training is well covered by several experts, but a few drills to include are:

- Bounding (Run)
- One Leg bounds
- Ankle Bounding
- Alternate Split Jumps
- One Leg Hopping
- Hurdles Jumps

Two very good indicators of progress are the:

1. Standing Long Jump test
2. Standing Vertical Jump test

Significant improvements in either of these indicators (that is not technique driven) will normally suggest an improvement in maximum running speed potential, other things being equal.

C. Medicine Ball Work

Under this category of exercises fall all the hundreds of exercises designed to improve both upper and lower body power. These exercises include overhead throws, twists, throws from behind the head, throwing then running, etc.

D. Sprinting

Maximum sprinting speed requires practice if it is to be improved. Most speed improvement programs schedule copious amounts of sprinting as their focus. It is usually believed that these sprint workouts determine the success of the individual at sprinting.

For the 100 meters hurdler, the typical sprinter exercises must be mixed with sprinting over the hurdles. It is worthwhile for the sprints over hurdles to be done at heights lower than the competition height as this allows the hurdler to focus more on the running between the hurdles and not so much on the task or negotiating the barriers.

Typical Sprint workouts

Without hurdles - 3 x 3 x 30-60m

With hurdles

1. 2 x 3 x 3-6 hurdles from block or 3 point start
2. Place all hurdles at 30". The athlete runs at full speed over the first two set at regular spacing. The next two hurdles are removed. The athlete will run hard in the resulting space before clearing the next three hurdles (hurdle 5, 6 and 7).

SPEED ENDURANCE

This is the final major component that needs to be trained. A lot of elite female hurdlers apparently spend very little time working on this component. Each year we see many hurdlers running between 7.85 seconds and 8.05 seconds for 60 meter hurdles, but come outdoors are unable to run equivalent times when the last five hurdles are involved.

This component is what separates in most cases the hurdler who is able to run at the very top level of the sport, from those who flirt at the edge of stardom and elitism. It is also the most under-estimated and ignored component in the training of sprint hurdlers. It is very common to ignore the effect that repeated clearances of barriers will have on the physical capacity of the 100 meters hurdles athlete. The athlete will effectively run more than 100 meters (in terms of effort) during a 100 meters hurdles race. It may be wise to train the athlete to run a distance of say 120 meters, in order to handle the speed endurance demands of the 100 meter hurdles.

How is this speed endurance built? The first step is to build general speed endurance. This develops the ability of the athlete to run distances over 60m at high speed. There are many ways to go about doing this. Personally, I like to ensure that the athlete is able to run a very fast 300 meters. How fast? Well, an athlete who wants to run 12.90 should be able to run a 300 meters time trial in at least 38.00 seconds, assuming that she has 100 meter speed of 11.70 to 12.00.

The athlete who aims for 12.4's or 12.3's should be able to run 300 meters in 36.0 seconds, a time which comparable to the world's elite. My experience suggests that being able to meet these types of times over 300 meters indicates that the athlete possesses more than enough speed endurance to meet the demands of 100 meter hurdling. When enough general speed endurance is present the speed endurance problem is not yet solved. In the 100 meters hurdles race, the athlete has to cover the last 3-4 hurdles while ensuring that her technique does not breakdown enough to slow her up.

This is a demand unique to hurdling among athletic events. In no other event or group of events is the athlete required to execute a highly technical sequence under conditions of extreme exhaustion. In fact, during the last 4 hurdles of the race, poor technique caused by fatigue is the biggest contributor to the slowing of the athlete. Many things happen during this period.

1. The athlete's stride shortens, so she takes off too far from the hurdle and begins to hit them, usually with the trail leg.
2. The athlete fails to continue to snap the lead leg. The result is expanded airtime over the hurdles, or "floating".
3. Wild trail arm action leads to the athlete becoming severely unbalanced, with the resulting delays on landing on the ground.

The athlete must therefore practice hurdling at high speeds under stress. Ways of achieving this include:

1. Runs over 12 hurdles from blocks with proper spacing. The 12th hurdle will be past the finish line. The athlete is timed using touchdown times.
2. Runs over 13 hurdles using 7.5 meters between each hurdle
3. 100 meters hurdles runs with hurdles 5, 6, 7 removed

CONCLUSION

The CAC region has under-performed in the 100 meters hurdles in comparison to a number of other regions. With 100 meters speed being so important to the outcome of the event, it is somewhat surprising to see the relative dominance of the Europeans. The Caribbean part of CAC has long been seen worldwide as one of the main speed producing regions, but there has been appallingly little success over the 100 meters hurdles. I believe that by seeing the 100 meters hurdles more as a sprint than an obstacle event, it is possible for the Caribbean to drastically improve on their historical performance in the 100 meters hurdles, and to match their success in the sprints without barriers.

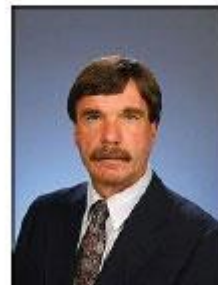
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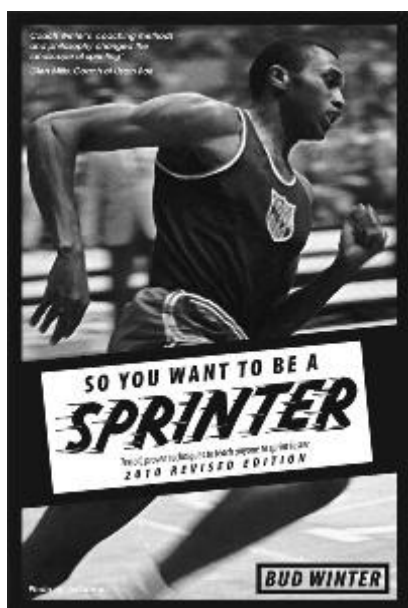
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