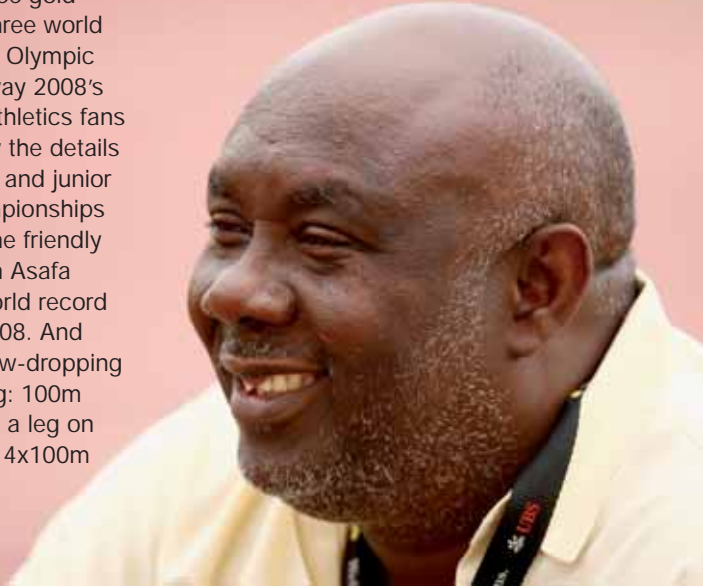


# Glen Mills

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**U**sain Bolt's three gold medals and three world records at the Olympic Games was far and away 2008's biggest sports story. Athletics fans around the world know the details well: Bolt's great talent and junior success, a world championships silver medal in 2007, the friendly rivalry with countryman Asafa Powell, a "surprise" world record in the 100m early in 2008. And then, those glorious, jaw-dropping performances in Beijing: 100m in 9.69, 200m in 19.30, a leg on the relay team that ran 4x100m in 37.10.

*Glen Mills*



Thanks to those races, a surname right out of a Hollywood scriptwriter's textbook and the liberal 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 IAAF 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 IAAF 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 medallist Ray Stewart (JAM) and 2003 world 100m champion Kim Collins (SKN), and he is currently the main coach at the IAAF 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 RDC 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 IAAF at the RDC in Puerto Rico and with the IOC. 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 IAAF 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 neg-



*Glen Mills (l.) with Usain Bolt*

ative 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 analyse 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 maximise 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 paralysing 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 sub-par 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.