

The merits of speed-orientated as opposed to endurance-orientated training for the 400 metres Hurdles

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“The author argues that the 400 metres Hurdles should be approached as a sprint event. The developing athlete will have built up a sufficient endurance base for the event as an active youngster: subsequent to specialization he should concentrate on speed and speed endurance work throughout the winter as well as the summer. The author gives examples of possible sessions for each period of the training year, concluding that a very fast basic flat speed is the key to world class success in the 400 metres Hurdles.”

Max Robertson was silver medallist in the 400 metres Hurdles at the Commonwealth Games, Edinburgh, 1986, and at the European Cup, Prague, 1987.

1 Introduction

In this article I will discuss the relative merits of speed-orientated training as opposed to endurance-orientated training for the 400 metres Hurdles. In the past, training periods have tended to leave speed work until the 'graft' has been done and competition is looming just over the horizon. I believe that this way of thinking has become outdated, and that it is possible to achieve the specific endurance required for the event through sprint training. We should be concentrating upon work which takes place mainly within the athlete's anaerobic threshold; this should include all aspects of training, such as weights, plyometrics, circuits and hills.

With this in mind I shall be discussing the sporting backgrounds and aims of international 400m hurdlers, detailing how speed and the ability to develop speed in all aspects of specific training, and in all periods of the year, is the optimum way to achieve these aims.

2 Background

As teenage athletes, prior to specialization, we also participate in a wide range of other sports at school. Indeed, we are advised early on in life to take part in as many sports, and in as many events within track and field, as possible. In this way we can discover which we enjoy the most, and at which we excel. The two are often inter-

dependent in sport, as success generally promotes enjoyment.

This varied sporting background develops general co-ordination and basic fitness, so providing the young athlete with an endurance base on which to build. In England we participate in football, rugby, cross-country, gymnastics, hockey and track and field. The relatively high level of fitness these sports require can, on specialization, be correctly developed - i.e. for the 400m hurdler with speed endurance in mind.

3 Overview of an annual training plan

Most of today's elite athletes started concentrating on their given event at about 16 years old. The 400m hurdler, having decided to specialize in his or her event, must then develop a training plan with 'specificity' as the key target. In other words, strength must be built up and converted into speed; that speed must be maintained over the full distance; therefore speed endurance must be increased.

The endurance base which the elite athlete built up as a youngster prior to spe-

cialization can be topped up at the beginning of each year with general conditioning work, especially in a year of single periodization. After this, until Christmas, the main emphasis must be upon speed endurance. Unlike in the past, when the 400m hurdler trained like an 800 metres runner, with lots of over-distance repetitions run at a slower pace with longer recoveries (this develops some speed endurance, but also tends to impose a 'middle distance shuffle' - short range of arm movement; low knee pick up; flatter foot strike and less powerful drive), under-distance work should be done at a quicker pace with shorter recoveries. Attention should be paid to style throughout, and sprint drills included as part of the warm up. The repetition distance should not exceed 500m.

After Christmas the emphasis shifts to the speed aspect of speed endurance. Two over-distance sessions per week should be sufficient, with all track work run under-distance. The athlete should be running well within his or her anaerobic threshold; recoveries should be increased slightly, whilst the number of repetitions should



remain the same as in the previous phase. This kind of training can continue until the competition phase, when pure speed sessions are introduced.

In this way the athlete's speed base can be maintained all the year round. It is for this reason that double periodization is used to such great effect by sprinters. It develops speed earlier in the year, so maintaining a high level of fast work for longer. The benefits are obvious.

It is possible to follow such a training plan in this day and age because the practice of travelling round the world to do a great percentage of winter work in warm and sunny conditions has become more widespread amongst athletes. Also, the provision of indoor training areas and a vast improvement in medical back-up facilities, along with an increased understanding of biomechanics, enable athletes to train at a higher intensity than ever before.

4 Specific aims

4.1 400 metres flat speed

Until the early 1950s the aim of the top 400m hurdlers was to break the 50 second barrier. In the late 1960s, it was to break 49.00. The modern era of 400m hurdling was heralded by David Hemery, an athlete with a 110 metres Hurdles background, at the Games of the XIXth Olympiad, Mexico, 1968, when he ran a World Record of 48.10. Nowadays, in order to compete at elite level in the event, an athlete must be able consistently to run under 48.00.

The great hurdlers of today are capable of a sub-45 sec. 400 metres flat. With a good differential of about 2.5 sec. between 400 metres Hurdles and 400 metres flat times, an athlete should be able to run around 45.50 for 400 metres flat, and correspondingly faster if he aims to break 48.00 over the hurdles. A differential of less than 2 sec. is virtually impossible, and some athletes have a differential of up to 3 sec. (The European Champion Kriss Akabusi has a personal best over 400 metres of 44.90, as compared to his hurdles time of 47.97.)

It is therefore essential for a hurdler to be able to run a fast 400 metres - and of course this necessitates a fast 200 metres time.

4.2 Weights

In the weights room an athlete should endeavour to develop muscular strength that can be converted into speed. Although it is desirable to lift heavy weights, work must be explosive; it is this explosive power which will be employed during locomotion. Therefore the weight must be moved as fast as possible through the range of movement.

This aspect of training can be further developed and honed by bringing in plyometrics. Here the key is to effect a fast rebound off the floor. The action was once described to me as reacting to hot coals beneath my feet. Drive can be achieved by doing speed bounds and hopping for distances of about 70m. Rebound work improves the athlete's explosive power and speed; it can take the form of depth jumping or two-footed bounding over obstacles.

4.3 Circuits

Circuit training should also encourage fast muscle contraction, and is good for fostering local muscle speed endurance. Rather than doing large numbers of repetitions of each exercise, I believe that it is more beneficial to practise each one for a set time with a timed recovery. The idea is to repeat each movement quickly through the required range of movement, and to try to increase the number achieved within the time limit. This will mean moving faster. Once a maximum number for the time allowed has been reached, the time can then be increased and progression maintained.

4.4 Hills

Hill work should also reflect the need for speed. Long hills have their place early in the year, as a part of general conditioning, but they should soon be dropped in favour of faster work up a short steep hill (30m) or a longer gentle slope (50m). This allows the athlete to work against the re-

sistance, using a style more akin to the sprint action.

David Hemery used to do a hill session in which he included a gentle incline measuring about 300m with a crest at the top. It then sloped down for about 50m. He would run up the first slope, inducing fatigue, and then over the top, increasing his cadence on the downhill slope. This gave him the feeling of increasing his leg speed off the final hurdle. He felt that this training was very useful for 400 metres Hurdles (Hemery, 1976).

5 Conclusion

400 metres Hurdles is considered today as a sprint event, and should be approached as such. In the II World Championships of Athletics, Rome, 1987, the

leading athletes touched down at hurdle five in 20.60, and the winners achieved times in the low 47s. Results such as these demand a very fast basic flat speed.

The developing 400m hurdler will have developed an endurance base as a youngster, kept that topped up with general conditioning work and speed endurance training, and worked throughout the year on improving pure speed. I believe that only in this way can he achieve world-class times.

The following table gives examples of track sessions that could be followed during each period of the training year. However, the phrase 'horses for courses' can always be employed in track and field, and it is the role of the coach to develop the most suitable schedules for his individual athletes.

Examples of speed- and speed-endurance-based mesocycles for the developing 400m hurdler

| Period one Starting mid-October | | Period two | Period three | Period four | Period five | Period six |
|--------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| i) 2 weeks | ii) 2 weeks | 6 weeks | 8 weeks competition period | 6 weeks | 6 weeks | competition period for the summer season |
| 4x500 [5'] 2x10x110 [30" & 10'] 3 mile runs | 4x500 [4'] as in i) 3 mile runs 3x3x300 [3' & 8'] | 500/400/300 [3'] [10'] 400/300/200 [3'] 4x150 [w/b] [8'] 3x200 [w/b] 3x(10/8/6)x110 [3' & 10'] 3x3x300 [2'30" & 7'] | | 2x(300 [1'] 250 [5'] 250 [1'] 200) [10'] 3x4x110 [w/b/jog back/30" & 10'] 3x150 [w/b] [10'] 3x200 [w/b] 2x2x300 [3' & 10'] [10'] 1x300 (max.) Hurdle session | 100/150/200/150/ 100 [5'] 2x2x300 [3' & 10'] [10'] 1x300 (max.) 2x(250/200) [5' & 10'] 1x7H/1x6H/1x5H [long] 1-7H/2-8H/3-9H/ 4-10H [long] | |

Note: The numbers/letters in square brackets indicate the length or type of recovery between repetitions and sets.
w/b = walk back.

REFERENCES

HEMERY, D. (1976): *Another Hurdle*. New York, p. 145.