

Sprint Success In The 100-200 & 400 Meters

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The 100, 200, and 400 meters are sprint races with different race requirements, tied together by one unavoidable and critical element: SPEED! Raw, unabashed, pedal to the metal, flat out speed. This is the main criterion for success, the final arbiter if you are going to run fast in either of the three sprint disciplines. And then to make matters worse, as the coach you are faced with a young man or woman who can:

- ✓ Run on your 4x100, 4x200 & 4x400
- ✓ Is your best 100-200 person
- ✓ Is your best 200-400 person
- ✓ And can even bust a leg on your 4x800 or Distance Medley

How do you train someone with such incredible range and the capacity to be successful using so many different energy systems? The high school and developing young sprinter must also deal with the accumulative stress from a long season, a long school year, and the rigors of being a teenager, including: puberty, boyfriends, girlfriends, being a multi-sport athlete, having a job, being responsible for siblings, parents who don't support their kids or don't want them to be athletes, being a "latchkey kid", or having to endure the heartache of a divorce. In the midst of all of that, answer these questions:

- ✓ How do you give them enough speed development?
- ✓ How do give them enough speed endurance?
- ✓ How do you develop their aerobic endurance?
- ✓ How do you give them enough strength work?
- ✓ How many races can they take per season?
- ✓ And in the midst of it all, how do you give them enough rest?

These are all critical areas that I plan to cover in this manual. The concept of sprint training being a process of establishing a race model is one that every sprint coach must learn. The race model is the road map to giving the sprinter a "race to plan" at practice and a "plan to race" on meet day.

- ✓ The 100 meters is a paced sprint with splits
- ✓ You have to show *patience* in the 100 and "*wait for it*"
- ✓ The middle 100 of the 200 is the fastest section
- ✓ The middle 200 of the 400 is a critical success zone
- ✓ The 100-200-400 are all based on the fly 30 meters
- ✓ You can get as strong as you "need" to be outside the weight room
- ✓ Train your sprinter – don't work them out (that's for 24 hr. fitness)
- ✓ Famous last words – "just give me one more"

In "Short and Long Hurdling Using the Rhythm Method", I outline the methods for establishing the training regimens for both the 100m/110HH and the 300LH/IH hurdlers. In it, I explain that coaching the hurdler is a complex undertaking that need not be complicated (big difference!). The complexity comes from taking all the pieces of the sprint puzzle and laying them out in front of you before the season begins. This allows you to take a look at what the puzzle pieces fully assembled will look like at the end of the season. And as the year progresses, you must always refer to the "box" (with the completed picture) to constantly remind you of what you want the sprinter to look like at the end of the year. But if you do not refer to the plan as the year goes on, you will lose your way and begin to force puzzle pieces together that just don't fit (mixing and matching training systems just because it makes them tired). Some coaches measure their success by the amount of vomit on the track after each session. If they puke after a training session, let it be a by-product of the plan (hey, that's a bonus!). Making a kid suffer will not make them a better 400 runner (they just learn how to suffer). But, making them suffer under control and with a purpose will make them a better and more confident 400 runner.

Sprint training becomes complicated when you try to put the puzzle together without the box to guide you through all the speed bumps that pop up as the season unfolds. My wife is an avid puzzle-person, and I once gave her a puzzle with 5 extra pieces in it. Do you know what havoc and chaos it created? Havoc and chaos are not acceptable training tools for the sprint coach.

As I said in the hurdle manual, there are numerous books and videos on the market, which expound the various philosophies on how to get it done. What I am attempting to do with this sprint manual is take a complicated event and reduce it to just being complex. The great thing about puzzles is that as the picture begins to take shape, it becomes easier to put the pieces together and soon the final outcome is just a well-placed piece away from completion. The same will happen with your sprinters with a plan. As you get closer to the end of the season, all you will have to do is connect a few well-placed pieces on the board and the picture will be complete. You won't have to guess if they are ready, or if you've done the right things (as coaches we will always stress at the end), you will know. So, let's begin to assemble our sprint puzzle with the first thing any good "puzzler" does when they open the box and dump out the pieces; they look for the corners and straight edges to set up the border.

Setting Up The Border

I once gave my wife a puzzle with no border, corners or straight lines. It darn near drove her off the edge. She did not know which way to turn, or how to "confine" the picture. Her attempts to build the picture were scattered and disjointed. Isn't that how we coach sometimes, with a hit or miss mentality? Let's dump out all the puzzle pieces and look for the corners and straight edges to supply us with all the answers to our training questions.

- ✓ How many weeks are there in the season?
- ✓ How many duals/scoring meets will there be?
- ✓ How many invitationals will there be?
- ✓ Is the athlete coming from basketball, softball, baseball, or soccer?
- ✓ What do I do if he/she gets hurt in March-April or May? (Pray!)
- ✓ The most important question of all - When is their biggest meet?

Start from your Junior Olympics, State Meet, District, Regionals, or League meet and count back to the first day of practice. Now you know how many days they will be available to you for practice, meets and recovery. For example, a typical high school track season can run from 13 to 16 weeks depending on when your state federation allows the first day of practice. Let's go with 14 weeks and see what we come up with. We will count back from the State Meet as week #1 and proceed back to the first day of practice as week #14.

Week #1	100-200-4x100 State prelims and finals	6 races
Week #2	100-200-4x100 District finals	3 races
Week #3	100-200-4x100 District prelims	3 races
Week #4	100-200-4x100 League prelims and finals	5 races
Week #5	100-200-4x100 dual meet and invitational	6-8 races
Week #6	100-200-4x400-4x100 dual met	4 races
Week #7	100-200-4x100-4x400 dual and Invitational	8 races
Week #8	Dual bye week and 100-200 at Invitational	2 races
Week #9	400-4x100-4x400 dual meet only	3 races
Week #10	200-400-4x400 dual meet only	3 races
Week #11	100-200-4X100 dual meet and invitational	6-8 races
Week #12	100-200-4x100 dual meet only	3 races
Week #13	100-200-4x100-4x400 practice meet	4 races

Week #14

1st week of practice

0 races

Totals for 14 weeks

56-60 races

There are 98 days in a 14-week season and 18 days have been used for dual meets, invites, league, district, and state competitions. That leaves 80 days to figure out what to do next. The next 14 days are going to be Sundays, which I hope can be used for complete rest and recovery days. Now you are left with 66 days to figure out what to do next. Over 14 weeks, the rules governing training stipulate that the athlete should have no more than 3 anaerobic workouts per week (hard days). That means during the next 14 weeks, you could get between 14 – 18 hard days to get them ready. That leaves 48 days to figure out what to do next.

If you factor in another 20 days for rest before meets including travel days if you have to fly or take long bus rides to the meet, you are left with 28 days to figure out what to do next. So, over the next 14 weeks you now have 28 days to do technique drills, medium to easy days, tempo running, starts, handoffs (these can be hard or off days), play days, sport games to freshen the legs, and surprise “go home - no practice today days.” This is the way you periodize your track season so you can plan out the whole season and see where you are headed.

Week	M	T	W	TH	F	S	Sun	
14	H	E	H	M	E	H	R	(3)
13	H	E	M	C	E	H	R	(3)
12	H	E	M	C	E	H	R	(3)
11	H	E	M	C	E	C	R	(3)
10	H	E	M	C	E	H	R	(3)
9	H	E	E	C	E	R	R	(3)
8	H	M	E	C	E	H	R	(3)
7	H	M	E	C	E	C	R	(3)
6	H	M	E	C	E	E/R	R	(2)
5	H	M	E	C	E	C	R	(3)
4	H	E	M	E	C	C	R	(3)
3	H	E	M	E	E	C	R	(2)
2	H	E	M	E	E	C	R	(2)
1	H	E	E	E	C	C	R	(3)

H	=	Hard Day
C	=	Competition/Hard Day
E	=	Easy Day
M	=	Medium Day
R	=	Rest Day

From the above example of a 98-day training year, you can see the following:
38 HARD DAYS + 33 EASY DAYS + 15 REST DAYS + 12 MEDIUM DAYS

The number after each training week represents the number of hard workouts and/or meets the athlete had. For 11 of the 14 weeks, the sprinter ran hard 3 times each week. This is going to be a problem if the sprinter is engaged in multiple race, multiple round contests. You're going to have one tired kid going into your biggest meet of the year (state or districts) when you need them to be at their freshest. This “puzzle” is not that complicated. As you look at the entire year this way, you can see where you can back off and where you can juice things up. This will also give you warning signs to prevent illness or injury when a sprinter complains of aches and pains. Looking at your yearly plan can tell you why their hamstrings are sore or why they may have a flu bug (can you stand being this

organized?). Plus, with all the work they are probably getting at the track meets, don't be afraid to rest them more than you planned. Rest is a component of training and is designed to prevent injury and is not designed for giving a kid a break after they've already gotten injured.

Now that your plan is laid out, on to phase two of your diabolical world domination of the sprints and relays. How fast are the kids that you have? How can you find out if they better suited for the 100-200 or the 400? It is all determined by their 30-meter fly test and a formula I stole from a close friend from Denver, Colorado. Tony Wells is arguably one of this country's foremost sprint minds, but toils away in relative obscurity as coach of the Denver Flyers. But his young women are ranked amongst the top 10 in every high school indoor and outdoor sprint/hurdle discipline on record.

Coach Wells believes as I do that the key to running fast is to determine the sprinter's maximum speed (over 30 meters with a running start) and then you can run at a % of that maximum velocity as the distance increases. Athlete A (male) runs a fly 30 with a 20-30 meter run up in 2.80 seconds (hand timed). It's better to use the same person timing all of the time for consistency if you cannot get electronic beams to time the zone. The time of 2.80 is divided into 30 meters ($30\text{m}/2.80 = 10.71\text{m/s}$) and a resulting velocity in meters per second is given. Take the meters per second and divide it into 100 meters and you will receive a flying 100-meter time, since the 30 was measured at top speed ($100\text{m}/10.71\text{m/s} = 9.34$).

Now before you freak out, this does not mean your boy is going to run 9.34 for 100 meters! Remember I told you this was the time for a fly 100 meters (which is still pretty fast!). What is missing from the formula you ask? Acceleration and automatic timing! If he were to run this 100-meter race from the blocks he would lose the benefit of the running start and that results in a loss of 1.0 seconds ($9.34 + 1.0 = 10.34$). 10.34 now becomes his hand timed 100 meters from the blocks. The next step is to add the 0.24 that is routinely used to represent the difference between hand timing and the Hytek ($10.34 + 0.24 = 10.58$ for his auto timed 100 meters). Now, a number of things can happen to prevent him from running that fast, but his potential is now a recognizable goal and it can be trained.

The 100-meter time of 10.58 can now be used to calculate the potential at the longer distances of 200 and 400 meters. Now whatever you get as a potential time depends a great deal upon whether the sprinter has the aptitude to run the longer sprints. Some lack the work ethic, some lack the courage, and many lack the patience to develop the speed power and strength to be successful at the other races. But we will proceed anyway with athlete A's development as a long sprinter.

We'll take the block 100-meter velocity of 10.58, which is $100\text{m}/10.58$ to produce a velocity of 9.45 meters per second. The 200-meter race is 98.3% of the 100-meter velocity, so take 9.45 meters per second and multiply it to 98.3%. This equals 9.29 meters per second and is the 200-meter velocity. To obtain the 200-meter time you merely divide 200 meters by the 200-meter velocity of 9.29m/s. This will produce a time of 21.52 for the 200 meters.

This now leads us to determining the potential at 400 meters by using a % of the 200-meter velocity. The 400-meter race operates at 90% of the 200-meter velocity; you would multiply 9.29 meters per second to 90% to obtain the 400-meter velocity of 8.36 meters per second. To obtain the 400-meter time, you merely divide 400 meters by 8.36 meters per second to produce a time of 47.84. Now you have a more accurate method of planning for the coming season. Instead of having a girl who has run 12.8-12.6-and 12.3 the last 3 years, do you assume she will run 12.1? She might run only 12.2, or she might rip an 11.80! But if you have her top end velocity, you have the key to whether or not she has the capacity to roll the big time. And if she has a bit of a nasty streak in her then the 400 could be right up her alley.

Now, let's take a look at athlete B, who does not know anything about his maximum speed and spends his training running miles, long reps and breakdowns on the track. The coach will say that this type of work needs to be done first to ensure that the sprinter has the strength to run the race. This is

an erroneous belief because in order to run the longer reps, athlete B must operate at a velocity far below that of the race pace. In addition, they are doing tons of it slowly for a long time (the longer you run slow, the slower you go).

Now make no mistake, aerobic development is good for sprinters, but there is nothing, I repeat, nothing about running slow that will make you run fast. Speed will positively impact endurance, but the converse is not so. It is important to call it what it is. Even a 600-meter run at practice in 80 seconds is still only 7.5 meters per second (10% slower than the pace needed to run as fast as athlete A in the 400 meters). Aerobic training is good for the development of the capillary beds in the blood stream for the transport of oxygen. This aids in the recovery of the athlete after hard bouts of work and allows the sprinter to bounce back quickly after running a series of rounds at an invitational, district or state meet. But running at 10% slower than the pace will not help you run 10% faster as your basis for speed development.

If I can run 30 meters at 10.71 meters per second, this is 22% faster than I need to run for the 400 meters. I have created a speed cushion that protects me from going out a little too fast. But if 7.5 m/s is the fastest I run at practice, and then I go out a little too fast, what protects me from dying in the stretch? Coaches will reply that they use the first half of the season to get them strong and then speed them up right before the big meets as if to believe speed development is some sort of light switch, they can magically flip and Viola! Speed! But if I can run 30 meters in 10.71 meters per second, how must 7.5 meters per second feel? You are running 30% under your maximum velocity, at a fast but comfortable pace.

It takes skill to run at 10.71 meters per second, but how can I acquire that skill if I am going to train my body to respond to an inferior skill level? Then after weeks of that type of work (the lower skill level) and ingraining into my central nervous system a less than optimum skill level, I try to push my body to a level of skill acquisition far above anything previously introduced in athlete B's training. This is the very reason why so many hamstring injuries occur at the end of the year before the biggest meets while coaches try to tinker with their sprinter's maximum velocity.

Let me put it this way; I have hired you to build a two-story five-bedroom townhouse for me, and I have given you 14 weeks to do it. All the necessary materials and resources to complete the job have been provided. But for the first 7 weeks, you build a single-story studio with triple reinforced walls that could pass for a bomb shelter. Then as the deadline approaches, you tear down the previous 7 weeks of work so you can build the structure you were commissioned to construct. You will need part of the remaining 7 weeks to tear down the structure and probably have less than 6 weeks to complete the original assignment. And you have wasted valuable time and resources on a project having nothing to do with the final product. Sounds silly, but that is what happens when a sprinter is given 7 weeks of "base work" and then must be re-wired during the next 7 weeks in an attempt to become who they were meant to become during the first 7 weeks. Any architect using this approach to building construction would be out of business after his/her first assignment.