



TRACK COACH

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TRACK COACH

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TRACK COACH

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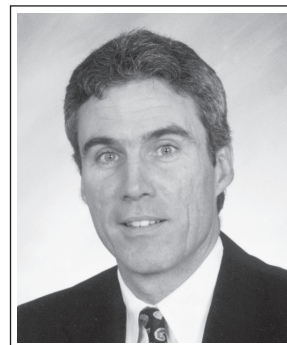
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FROM THE EDITOR

RUSS EBBETS



SPEED AND ACCURACY

There is a "law" in motor learning called Fitt's Law. Even if you are not familiar with Fitt's Law by name there is a good chance you've experienced the law in your daily life. Fitt's Law states that the more quickly we try to do a physical task the more inaccurate or sloppy we become. This seems to hold true whether we're putting round pegs in little holes, stacking plastic cups upside-down on YouTube or quickly typing a Track Coach editorial.

In almost all competitive endeavors quicker actions though yield better results. After all the Olde English word "sped" meant success. Certainly, practice is one way to improve accuracy, but in truth that only works to a point. Speed is the enemy of accuracy. There inevitably comes a point where, as they say, "something's gotta give."

Speed and accuracy comes into play in the relays, particularly the 4x100m. The 4x1 involves a more complex set of challenges as we are now dealing with four people with different skills, abilities, sizes and shapes, not to mention psychological qualities that can also be as different as they are similar. Yet that becomes one of the beauties of the race as the successful teams somehow raise complementary actions to an artform.

What needs to be established for success in the 4x1 relay is a philosophy of the relay that is simple to understand, simple to implement and meticulously executed by all. Maybe the first tenet of this philosophy should be the general agreement that the baton should travel the shortest path from start to finish. This builds on the old adage that the shortest path between two points is a straight line. The obvious problem here is that the 4x1 is contested around two unstraight turns.

Once the "shortest path" point is accepted the hands carrying the baton can be determined. The shortest path for the baton will dictate a right-left-right-left hand carrying pattern. Why? Simply put if sprinter #1 carries the baton in the right hand he can hug the inside of his lane around the first curve (the shortest distance around the curve) and hand off to sprinter #2's left hand. Number 2 should be stationed to the outside of the lane for the backstretch straightaway run.

Sprinter #2 can stay to the "outside" of the lane down the backstretch and enter the second curve making a pass to the right hand of sprinter #3. Number 3 should also hug

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EDITORIAL COLUMN

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the inside of the curve, again running the shortest distance around the curve. Sprinter #4 is to the outside of the lane and receives the baton with the left hand and it is on to the finish. Using the right-left-right-left carrying pattern gives the baton the shortest course over the full loop of the track.

A second important factor in relay success is the speed of the baton over the course of the race. Theoretically the baton with the fastest average velocity should win the race. Although I have never seen stats that prove this one way or the other it makes sense, but that being said I am sure that there are individual anchor legs such as Usain Bolt, Bob Hayes or Evelyn Ashford that may prove that exceptions are "the rule."

The reason why the baton speed is problematic is that the intersect of the incoming/outgoing exchange happens during two different phases of the 100m

sprint action. The incoming sprinter is in the deceleration phase of the 100m where there is a gradual slowing of the runner the farther he gets into the race. Complicating this fact is that sprinters #1, #2 and #3 are all decelerating into (or out of) a curve.

For the outgoing sprinter he is in an acceleration phase where he is approaching top end velocity (maximum velocity) that is further fueled by the excitement of finally getting the opportunity to "go." Passing the baton too soon or too late would graphically present with a stop/start pattern that compromises the whole process, loses races and drives coaches to distraction. Step patterns, go marks and a steady hand for passing or receiving all become equally important considerations that go into the mix of a successful exchange. The last things to consider in one's relay philosophy of the 4x1 is that "little things count." By no means am I suggesting that "nit pickers" make great relayists. What I am saying is that the race demands identification and attention to details.

Relays can be won or lost by as little as 1/100th of a second. Sprint-wise 1/100th of a second is about the width of your pinkie finger. Look at that for a second. Four people, 170-190 steps, 40ish seconds and the winner gets decided by the width of the smallest finger. Recognition and attention to the smallest details is what gives an added advantage to the collective speed and accuracy of four people.

Phew. It was never that complicated in elementary school. Passes were visual with a crash exchange pattern, staying in your lane was desirable and the team with the fastest anchor always seemed to win. Times change for everyone.

In this issue we have some real experts who will share their expertise on what has worked for them and what should work for you. While there are some slight differences of opinion on the correct "how-to's" I think you'll find enough of a consensus that your successes this spring will be due to a consistent relay philosophy, exacting practice and a creative mix of both speed and accuracy.

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4 X 100 RELAY ROUNDTABLE

COORDINATED BY RUSS EBBETS

Editor Russ Ebbets gathered an A-list of sprint relay coaches and experts and plays 20 questions with them.

THE PANEL: **Glenroy Gilbert** was an outstanding sprinter at LSU and for Team Canada, where he earned gold medals as part of the Canadian 4x1 team at the 1996 Olympics and the 1995 and 1997 World Championships. Since 1996 he has worked with Athletics Canada, primarily as coach of the Canadian men's and women's relay teams. In 2017, he was named Athletics Canada's permanent head coach. Gilbert is answering these questions in conjunction with **Dana Way, MSc**, a biomechanist with Athletics Canada for more than 15 years, with a primary focus on the relay programs where he analyzes race strategy and exchange technique (**GG and DW**). **Junior Burnett** is in his tenth season as assistant coach for sprints, University of Albany. In 2017 he

was a nominee for the USTFCCCA Northeast Assistant Coach of the Year. He has coached nine NCAA first round qualifiers and produced 33 America East sprint champions. He is Level 2 Certified in sprints, hurdles and relays (**JB**). **Caryl Smith Gilbert** is currently director of men's and women's track & field at the University of Georgia. Prior to Georgia she was the head coach at the University of Southern California, where her women's teams won the 2018 and 2021 NCAA outdoor team championships; she was National Women's Coach of the Year both of those years. She also led the men's programs to top five NCAA outdoor finishes in 2014, 2015, 2018, and 2021. A UCLA graduate, she was a three-time All-American in the 100m, 4x100, and 4x400 (**CSG**). **Brooks**

Johnson was a member of the gold medal-winning U.S. team at the Pan Am Games in 1963. Johnson has coached at the University of Florida, Stanford University (succeeding Payton Jordan), and Cal Poly. He was part of the Olympic coaching staff in 1976, 1984 (women's team coach), 2004 and 2008. He still coaches individual athletes (**BJ**). **Dennis Grady** is a certified Level 2 coach in sprints, hurdles and relays. He was a long-time high school coach in the Columbus, OH area, his 4x100 teams winning two Ohio state boys' titles. He was most recently a volunteer coach at the U.S. Naval Academy. He has published ten articles in *Track Coach*, specifically on the 4x100 relay (**DG**).



Caryl Smith Gilbert

The fly zones are gone, how many steps does it take to get up to full speed for the outgoing runner?

CSG — Well... for the women 25-28 and for the men 27-31 steps will work. Keeping in mind that the speed of the incoming runner and the acceleration experience of the outgoing runner still affect the number of steps, so there is really no set amount in theory.

GG and DW — The outgoing runner won't reach top speed within the zone as that normally happens after 50m. However, most athletes can get up to 80% of top speed near the end of the zone. In terms of steps, that is dependent on the athletes' stride length during their acceleration pattern.

DG — The outgoing runner will not reach maximum speed before receiving the baton. If the plan is to exchange deep in the zone, 25-27 meters in, the outgoing runner is likely at 80-85 % and still accelerating. I base that on an analysis of Usain Bolt's 100m World Record. With the aid of starting blocks Bolt

reached 82% max velocity at 20 meters. He did not reach 99% until 40 meters.

JB — An outgoing runner needs anywhere between 11-13 steps to get to top speed for a smooth and clean exchange. This number of steps is ideal for both runners to match speed in the last third of the 30 meters zone.

BJ — Outgoing runner cannot reach maximum speed within the exchange zone.

Coaching Ed has long taught right-left-right for the baton exchange pattern – why is that?

JB — Right-left-right pattern allows for best transition of baton from one runner to the other. Also, for safety and preventing of serious injuries while moving at maximum speed. The baton can only get around the track smoothly if it passes in this pattern "right-left-right," since runners share a confined space during the exchanges, and they are moving at high velocity. Safety and logistics are my reasons.

DG — The R-L-R-L hand pattern keeps the baton in the middle of the lane out of harm's way. Legs 1 and 3 (on the curve) favor the inside of the lane; leg's 2 and 4 (straightaway) favor the outside. This alignment keeps feet, legs, and arms from unwanted contact.

BJ — Left hand keeps baton closest to inside the curve.

CSG — First leg runs on the inside of the lane, 2nd on the outside, 3rd on the inside, and 4th on the outside. So, when you alternate hands, it makes for a smoother transition from hand to hand. Also, this keeps

the first and third runner running on the inside of the lane with the baton in their right hand and the second and fourth runner on the run on the outside of the lane with the baton in the left hand.

GG and DW — Well, if it were left-right-left, the corner runners would have to run on the outside of the lane. It is much more efficient to run on the inside of the lane

Do you prefer the underhand or overhand pass? Why that choice?

BJ — Overhand because of easier sight line to inside of hand.

GG and DW — Neither. The Push pass is the preferred method in Canada. We believe it promotes a more controlled pass (less reaching) compared to overhand. We also believe that it gives you "free distance" when compared to the underhand or upsweep pass. A secondary downfall to the upswing pass is that it is often passed to the receiving runner in the middle of the baton. This will not leave much room for the next runner without repositioning the baton while running.

CSG — I personally prefer the overhand pass because if you have a good target and a high hand all the incoming runner has to do is "push" the baton into the outgoing runners hand.

JB — I personally prefer the overhand pass. I like the overhand pass better because of its practical nature and resemblance of the running action. The runners don't need to make much mechanical or technical change during sprinting to execute this pass. If taught properly the runners don't need to change their top speed mechanics for this pass.

DG — I prefer the overhand pass — but not really a “push technique” — with the receiver’s arm extended back with the palm up and a V-target. Keeping his normal arm swing the passer extends his arm and flicks his wrist placing the stick in the V of the hand. The underhand pass requires the runners to be closer together and takes more time. BTW, how did the Japanese men’s team fare in Tokyo?

What should be the thought of the outgoing sprinter regarding the baton exchange? (i.e. – hold hand still, give a big target, etc.)

CSG — The outgoing runner should be thinking about literally leaving the incoming runner. Also, they should be thinking about putting their hand back halfway through the zone for a silent pass or listening for the call if they’re using a verbal command pass. If they’re halfway through the zone and they don’t have the stick then slow down and put your hand back and wait, the incoming runner’s job is to make sure he/she gets the baton to the outgoing runner.

DG — First and foremost the outgoing sprinter should be relaxed: confident that the marks are good, and focused on the incoming runner — leaving when he hits your “Go” mark. 2) Accelerate as fast as you can — make the incoming runner catch you! To keep relaxed and have the best sight line to the Go Mark, I prefer the two-point stance for the outgoing runner. (Note: Italy’s men’s OG Gold medal team, #3 runner used 2-pt stance and the exchange could not have been better!)

BJ — Give as large and steady a target as possible.

JB — The outgoing sprinter should give the incoming sprinter the biggest target possible and hold his/her hand still. Should be patient through the zone, be aggressive, relax and not worry about the end of the zone (trust). The bigger and sturdier hand gives the incoming sprinter the best chance for clean and smooth baton exchange. Relays (4x100) are won not only due to speed, but due to excellent exchanges. (Hard to hit a moving target.)

GG and DW — Thoughts will be dependent on the strengths and weakness of each athlete. If an athlete struggles with one aspect, then that portion will be re-cued. Generally, the sequence is, wait until the incoming runner is at the “go mark” (leave on time), accelerate hard, hear the cue “High”, lead with the elbow, give a firm target and steady hand. Sometimes athletes need simple reminders on one of these steps.

What do you recommend as the thoughts for the incoming runner?

BJ — Focus on “V” of outgoing runner’s hand.

GG and DW — Again, this is dependent on the individual. Often the messaging is, SEE the target then make the pass, run THROUGH the outgoing runner, not TO the outgoing runner.

DG — Attack the Zone! Call stick when you are ready, but do not reach at the same time you call stick. Be patient wait for the target and firmly place the baton into the V. Stay in your lane until all traffic clears.

JB — I need my incoming runner to remain aggressive, maintain great sprint posture and mechanics, while relaxed. Don’t get too excited early, but concentrate on sprint technique early, midway and late. Attack the last 40 meters once inside the zone, try to outrun the outgoing runner. Run an extra 20-30 meters after the exchange. (Helps with deceleration.)

CSG — The incoming runner should literally be thinking about running over the outgoing runner. Also, one item of importance is to run past the end of the relay zone. This will ensure that if any mistakes are made the baton can still get to the outgoing runner.

If you are in a high school or collegiate coaching situation how much time is spent weekly practicing relay exchange work?

GG and DW — Anytime you can get your hands on a baton is a good thing, especially at these levels. Even when you don’t have a dedicated relay practice scheduled you can incorporate baton drills in a warmup very easily. Building a solid foundation of relay skills at an early age is extremely beneficial. When it comes to choosing a team in Canada, relay specific skills and knowledge are major factors.

JB — I conduct relay practice 3 times weekly in season. I break down each session to a specific skill: zone running/handoff, zone exchange focus on top speed exchanges 3-5 per session, and standing static drills. Teaching basic hand drills and blind passes. All have their place in my training plan based on athlete knowledge and level of development.

DG — Sticks and Starts are the day before competition practice. The Baton practice is fairly quick: All four runners are present at each zone as we walk around the track. While the two involved practice, the other two are watching to 1) make sure the outgoing runner leaves on time; and 2) see where the actual pass occurs. We move on to the next zone when all four are satisfied that that exchange is good. (Time: 35-45 minutes)

CSG — During an average outdoor season we spend about 1 to 2 days a week working on relay passes.

BJ — At least once a week.

Do you have your sprinters do any of their track work carrying a baton?

DG — Besides the lead-off runner practicing starts with the baton, No. Unlike the football running back prone to fumbling the ball, our sprinters know there is no reason for the baton to ever be dropped. The passer makes sure the baton is secured.

CSG — I personally do not make a practice of having sprinters do track work with a baton but it is very feasible and probably a good idea for someone who may be inexperienced to carry the baton or do starts with the baton.

GG and DW — At this level it's highly unlikely they will and if they do, it's usually only the starts for someone that might be running first leg.

BJ — As much as possible.

JB — I never did this with my sprinters before. They ran with baton dur-



Brooks Johnson

ing their warmup jog, helping hand placement and confidence. I also heard of quarter-milers carrying the baton during 400m workouts as they tend to be more relaxed running the 4x400 relay than the open 400. As some 400 runners are better at the relay than the individual race, carrying a baton during workouts tend to narrow the relaxation gap between both events.

How many strides can or should a relay runner be expected to hold the exchange position – running with the back arm elbow extended?

CSG — The goal is for the outgoing runner to run as few steps as possible with their hand extended. So that's why it's important to have the proper amount of steps because you want to keep the baton moving as fast as possible through the zone.

GG and DW — In order to have an efficient exchange, you ultimately need to minimize the amount of time the outgoing runner has their hand back. The longer the athlete has his hand back, the more problems arise; they will begin to decelerate,

the extended arm will start to sway and they will most likely panic and look back. If you were to give it a number, I'd say two strides would be an efficient pass, but you have to be able to hold that position for up to 5/6 strides.

BJ — Hold the hand available until exit from zone or receiving the baton.

DG — If the timing is right and the exchange is performed well, the arm swing should be normal and the pass is made in one stride. As a general rule the more strides taken with the arm extended, the less likely you will have a good exchange. (See U.S. men Tokyo Olympic prelims)

JB — I say anywhere from 2-4 strides, with two the minimum, for a very quick exchange. This requires lots of precision and drilling at high speed. The more time spent with elbow in extension the more deceleration can occur in the zone (slowing down the baton). Two to four stride requires lots of top end speed exchanges in the zone and lots of film reviews.

For the outgoing runner's receiving hand, do you recommend a "soft" hand that allows the infantile grasp reflex to be naturally activated (when something hits the palm the fingers flex closed) or do you recommend a stiffer hand that closes with the slap of the baton?

BJ — The soft hand to cause grasp reflex until baton is exchanged.

JB — I recommend the stiffer hand option, because I prefer a big and still target. This also has other benefits too like a chance for a much quicker exchange.

DG — The former with the palm up, V-shaped target: the stick placed in the web of the thumb joint. Some muscle-bound sprinters have less range in extending the arm back and modify the target with the "chicken wing" out to the side, flat hand with thumb down, and the baton is pushed into the target. That is the technique used by the U.S. men's national team. Judge for yourself by their results.

CSG — I prefer that the outgoing runner puts the arm back from the shoulder leading with the elbow with the thumb down and the four fingers closed and I prefer the incoming runner to push the button into the middle of the palm so the fingers close naturally.

GG and DW — I think it's a bit of both, maybe leaning on the stiffer side. You want to have a firm target so that when the baton is pushed into the hand it wants to close around it. If the hand is too soft, the athlete will tend to start searching for the baton once it initially touches the hand.



Junior Burnett

Is not one of the problems with the short relay the lack of opportunities? As more money has come into the sport and the top athletes have opted for an "early out" or skipping college altogether – has this not contributed to a lack of competitive career experience in the sprint relays past high school?

GG and DW — Lack of opportunities at the top level can certainly be a problem especially in North America. We in Canada try to expose our athletes to as many opportunities as possible through yearly camps and relay specific events. Running relays in college can be a huge advantage to runners as they are generally exposed to multiple sports and a lot of races. However, it can be a disadvantage at times when the athlete tries to adapt to our Canadian system. This is not usually the case though.

BJ — Generally sprinters have been working baton throughout their total career.

CSG — I do not believe the short relay has any lack of opportunities. We coach the student athletes that are on our team the best we can and for those who decide to go pro early we just don't get to coach them. I

believe college track and field gives every student athlete a great deal of experience of being able to run all four relay legs and teaches them to know what the zones mean through repetitive races.

DG — I think it is more that the relays are not that important for the pros; the individual events are by far the priority. Russ, your two-part roundtable in previous Track Coach issues about the relays of Coach Elliott of Villanova at the Penn Relays shows the importance of relays at the high school and collegiate levels.

What about the influence of private coaches, shoe companies, agents, parents and personal agendas (initiative clauses) and their effect on national team relay selection and even which leg to run?

BJ — Outside influence is usually minimal, especially at elite level.

GG and DW — This is a good question; I tend to think this might be a primarily U.S. team issue. That is certainly not to say other countries don't have their share of issues in this area but the nature of the U.S. system and the fact that the U.S. has the best track and field athletes in the world who have enormous contracts and incentives for medals at the World and Olympics games creates these types of problems. There is lot of pressure by all the entities above for athletes to run and to run in certain positions on the track which I feel is the root cause all the problems that ails in particular the U.S. men's short relay.

JB — Surely, I see that as one of contributor that causes lack of competitiveness in the short relay

4x1 Relay	Caryl Smith-Gilbert	Dennis Grady	Brooks Johnson	Glenroy Gilbert	Junior Burnett
Leg 1	A great starter	Obviously, a good starter and curve runner.	Good starter, shorter distance	Good starter who can accelerate and run a curve, you can also utilize an athlete with weaker exchange skills, we have typically seen shorter athletes run this position for Canada.	A good starter, yet an excellent curve runner. The 1st leg: curve running must be superior in starting strength. He or she doesn't have to be best start on the team, but if he is the best curve runner and starter, you're on the way to excellence. An aggressive sprinter, but at the same time very composed.
Leg 2	A great finisher and someone who can run past 100m very well because this is the longest leg of the relay.	Second fastest sprinter. Tall, long stride and aggressive.	Fastest runner	Must have good exchange skills with left hand and excellent relay knowledge as the second exchange is a tough one to master, must be able to hold top speed for longer distances, sometimes used for athletes that need longer acceleration times, we have typically used taller athletes with long strides for this position.	Great top/max velocity speed, a relaxed sprinter at top speed also under pressure situations. Great at receiving and handing off the baton. Have the ability to run well at 200 meters.
Leg 3	Anyone who is a good curve runner or a good 200 runner. This is the most difficult leg because you have to receive the baton, run the curve and hand off the baton so you need a person who has a lot of relay experience at receiving and handing off and is mentally and athletically capable of stepping up to the challenge.	Calm, cool leader. He has the more difficult task: a straight on look at the go-mark; a faster runner coming in so he has to control his nerves and not get "happy-feet" and leave early; then, he has to catch a faster runner. IMO he must be the most steady and confident. A good spot for a hurdler.	Most expert handling baton	Almost always a 200m runner, excellent relay skills and knowledge as the 2 nd exchange is a tough one to master. Physical qualities?	As the lead person excellent curve runner, must be levelheaded great concentration skills and great at receiving and handing off the baton as is the second leg.
Leg 4	I prefer a real killer athlete on this leg who can either run someone down or put space between them and the rest of the field.	The anchor. Always the fastest runner for me. Period.	The most competitive and strongest	Composed and unphased by pressure. This position is always a source of contention. Many times, the fastest runner is used here because it is only a receiving pass. In many countries, the fastest athlete is focused on the individual events and unable to get the necessary repetitions for other positions.	This runner must have great composure, aggressive sprint attitude, great at judging speed. Excellent max velocity and relaxed at longer sprint events like 200m. Love winning. All four runners must be good judging speed and good to excellent with acceleration mechanics.

at the international level (especially men's relays). Skipping college has lot to do with athletes' unpreparedness and lack of knowledge in the sprint relay. There is so much to learn in college that you cannot gain at relay camp for 2-4 weeks before major championships and Olympic Games. Many of the mistakes and underdeveloped skill can be worked on during college competitions/college years.

CSG — When it comes to national team selection of course everyone

has their own biased opinion about what is preferred. However, if an athlete knows how to run all four legs then that eliminates any confusion and cuts down on limitations that will be placed on that athlete.

DG — I have been watching the national relays intensely for 15 plus years and I see little consistency on 4x1 selections. The most common process is "self-selected", meaning the first-four finishers in the 100m are the de facto members for the next global championships 4x1's.

World Athletics rules for the 4x1 relay are not conducive for well-prepared relays. WA's focus is saving a few dollars by limiting the size of a country's team.

Run down the four relay legs for me. What are the preeminent skills or physical qualities you see as ideal for a relay runner in that particular slot?

Each answer is presented in the chart above.



Glenroy Gilbert

How does one correctly hold the baton while running. Does the grip change while one is making the pass?

GG and DW — In a push pass, if the pass is completed properly, the athlete should receive the baton on the top third not the middle. The baton is received in the palm and fingers wrap around with grip that is tight but not strained. This will reduce the chance of having to “fiddle” with the baton in attempt to give the next athlete more baton to work with. It should be set up so that when giving the baton it is just an extension of the arm during the stride.

CSG — The baton should be held at the bottom and hand off the top which makes it be at the bottom for the next person. You never change hands in the relay or you risk slowing the baton down in the zone therefore slowing down the relay time overall.

JB — The correct way holding onto the baton is at the lower third. When done correctly the runners have no need to adjust while running or during exchanges. If the situation occurs and he or she have to adjust while running down the track,

it's best to make the adjustment before the exchange comes up. It's always very risky adjusting the baton during the exchange, high risk and low-rewarding.

DG — The baton must be shared. The passer holds the bottom half and the receiver gets the top half, which becomes the bottom half as his arm swings forward. The grip should not change for the overhand pass. (Note: the underhand pass has each hand moving up the stick. By the time the anchor gets the baton his hand is at the top of the baton.)

BJ — Holding close to end leaving space for outgoing hand.

Ideally what part of the zone should the relay baton be passed? Does this change with the different legs?

JB — In a perfect world, the baton would be best passed two to three steps after the middle of the zone. I like to see it done at 2 steps after the middle: for the outgoing runner about 23 -25 meters. You must drill these exchanges well in order to execute them in competition and be successful at it. No need for changing the distance except if you are working with a slower runner.

BJ — This is individualized to incoming and outgoing (sprinter's) speed and strength.

CSG — I personally prefer the baton to be passed before the middle of the zone. However sometimes your personnel can determine where you want the baton to be passed in the zone. Meaning I might want someone to get the baton early in the zone because I know he can run a good leg for me and I prefer

for him to have the baton longer versus someone who I prefer to run a shorter leg.

DG — The deeper the better: that is where the speeds of both runners are closest to being equal. It does change, especially at the high school level as mentioned before when trying to extend the distance your fastest runners have the baton in their hands. (On 4x200 relays, the opportunity to extend a specific leg is huge)

GG and DW — It is well established that, if done correctly, the further in the zone you pass, the faster the exchange will be. In Canada we strive to pass anywhere after the scratch line. It should not change with respect to different legs, however, depending on the situation, the second exchange can be adjusted based on the lane. This is done because the baton is exchanged on the curve and depending on the lane, it will be more or less difficult depending on the “tightness” of the curve.

How much consideration do you give the deceleration pattern (from 60m to end of the relay leg) of the individual relay legs? Is there a different concern for the turn runners (#'s 1, 3) versus #2 on the back straight?

GG and DW — The deceleration pattern is considered based on the individual athlete's current fitness, how many races they have run, what lane they are in and of course the position that they are running. If a runner is on an inside vs outside lane he will most certainly decelerate differently. In terms of position, the corner runners will typically decelerate more as well.

DG — Comparing each of the four legs to what you have in the open 100m is natural. But the only leg using blocks is #1. The acceleration pattern without blocks will change somewhat. Could not the deceleration pattern also differ? I coach “Attack the Zone”, so my answer is none. The placement of the “Go mark” has accounted for the slight deceleration at the end of the 120 m run.

JB — I don’t give much consideration to deceleration for the sprint relay. I consider the first leg runner and second runner to a lesser extent. If the runners are in the correct order and practice the correct specificity for each leg deceleration will not happen. However, in particular situations the second leg can run extra distance and might run into deceleration. Specific training can fix this.

CSG — It is very important for each incoming runner to run past the end of the zone so I don’t talk much about the deceleration pattern from 60m to the end.

BJ — This needs attention and individualization.

Do you recommend any change in sprint mechanics when running the turn? (i.e. – inside arm drops back, outside arm crosses over, etc.) –

DG — Yes, and we practice running curves to focus on these sprint mechanics along with solid “front-side” mechanics as taught at the USATF Level II school. In addition to the arm swing adjustments, I recall one instructor emphasizing the lean starting from the inside ankle. Turn running can be improved, no question.

GG and DW — At this level we typically do not coach any running mechanics without discussing with the personal coach.

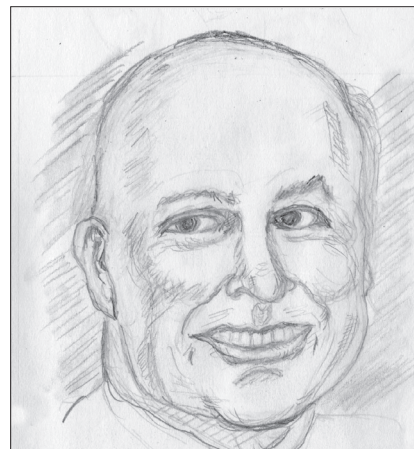
CSG — The turn should be run the same as you run the turn in the 200 keeping in mind you have to stay close to the inside with the baton in the right hand since you are handing off to the fourth leg who will be on the outside of the lane taking the baton in the left hand.

JB — No, I don’t recommend sprinters changing their sprint mechanics for the turn. I recommend and encourage them to maximize centrifugal force on the turn. Their posture remains the same as sprinting down the straightaway; the only thing that changes is their foot placement on the ground. They touch down inside out on the turn. The sprinter’s inside foot touches down outside of the line where the outside foot touches down. This creates a natural lean from the athlete’s ankle joint through to the head. Just run through the turn with normal sprint mechanics as down the straightaway.

Do you prefer a verbal or sight start cue for the relay exchanges? Why?

BJ — Exchange based on number of strides preferable to verbal commands

GG and DW — In Canada we use a sight cue to initiate acceleration and a verbal cue to initiate the actual exchange. With relays, you try to limit the variables that can go wrong. The outgoing runner will react to the incoming runner as they reach the “go mark”. By doing this, we limit what the incoming runner’s responsibilities are and get rid of the



Dennis Grady is also a talented cartoonist.

guess work. The incoming runner can focus solely on the outgoing runners’ acceleration and use the verbal cue of “High” to initiate the exchange.

JB — I prefer the sight start cue for relay exchanges. It presents multiple opportunities and challenges for runners to learn and develop new skills other than just sprinting around a turn or down a straightaway. This technique can foster discipline and trust for both the incoming and outgoing runner. They can learn to judge distance, speed and coordination.

DG — Verbal. The 4x1 exchange is a “blind” exchange because the receiver does not look back for the baton (as with the 4x4 exchange). The passer is in control of the timing, he sees when he is in position to pass, he calls “stick”, he waits for the target to appear and puts the baton into the hand — letting go of the baton when the fingers close. Fast, efficient, sure and in one stride.

CSG — I prefer a sight start cue because when there’s a lot of traffic and a lot of voices, confusion can take over. However, for someone

DENNIS GRADY'S HINTS FOR 4X100 SUCCESS

<p style="text-align: center;">LAWS GOVERNING RELAY EXCHANGES</p> <p>1) Never leave the zone without it. Just because an exchange isn't perfect is no reason to give up on it. The outgoing runner, nearing the end of the exchange zone without receiving the baton, should open up, turn around and look for the baton, slowing up, if necessary. A poor exchange beats no exchange.</p> <p>2) Always finish the race. If the baton is dropped, pick it up! Don't just stand there and argue about who is to blame. And don't disqualify yourself because you think you were out of the zone. If the "stick" is in the zone, the pass is legal. Let the officials do their job; your job is to finish the race. Stick to it! DNF (Did not Finish) usually means "you quit!"</p> <p>3) Timing is really everything. We are talking hundredths of a second. Don't fall asleep at the switch by leaving too late; don't jump the gun by leaving too early. Coaches may debate which is worse. I side with the leaving late. With Law #1 firmly in mind, a runner leaving early can salvage the race. On the other hand, if a runner leaves late, the time lost is gone for good.</p> <p>4) Grady's Law: The more strides the receiver takes with his arm extended back, the less likely the exchange will be a good one.</p>	<p style="text-align: center;">THE BASIC RULES AND PROCEDURES</p> <p style="text-align: center;">are fairly straightforward and widely known.</p> <ul style="list-style-type: none"> • Lanes all the way. Make sure you know your lane and the order you are running before you go to your exchange zone. • The baton stays in the middle of the lane all the way around. The two curve runners (legs #1 & #3) will run on the inside part of the lane -to save ground- and will carry the baton in their right hands. The straight-away runners (legs #2 & #4) will favor the outside of the lane carrying the baton in their left hands. This right-left-right-left sequence, as well as the inside-outside-inside-outside positioning of the runners, is most critical for good alignment of the runners as they pass the baton and prevents heels from being clipped and outgoing runners being tripped. These positions also keep the baton out of harm's way; yes, the stick is sometimes knocked out of a runner's hand! • The baton, not the receiver, must be in the 30-meter exchange zone when the pass is made. (The 10-meter acceleration zone has been annexed) • Know the rules pertaining to marking your "go marks," whether with tape not always allowed - or with half tennis balls, sometimes only to be placed on the outside line of your lane. <u>Only one tape mark for the pros!</u>
<p style="text-align: center;">Responsibilities of the Incoming Runner:</p> <ul style="list-style-type: none"> • Attack the zone. Do not slow up or relax until the baton is passed. • Don't collide with the next runner in the adjacent lane. (legs 1 & 3) • Share the stick: You get the lower half, the receiver gets the upper half. • Maintain good running form. Running with your arm extended slows you down. Winding up to make the pass is a waste of time. • Speak first, then reach. Do not give the verbal command of "stick," "go," or whatever, and reach at the same instant. Give the command, keep running, and wait for the outgoing runner's arm to extend, then reach and place the baton in the open hand. • Do not release the baton until you "see" it into the hand of the outgoing runner. <i>The baton should never be dropped!</i> • Stay in your lane, but don't worry about running out of the zone- you are allowed. • Always look back before exiting the track, someone may still be running behind you. <p>-----</p> <p>Dennis J. Grady, USATF Level II Coach Sprints/Hurdles/Relays (revised Jan. 2022)</p>	<p style="text-align: center;">Responsibilities of the Outgoing Runner:</p> <ul style="list-style-type: none"> • Step off the distance (determined after repeated practice) to your "go" mark. Place your mark, usually half a tennis ball or tape. Return to your starting position inside the exchange zone. You must be inside and remain there when the gun starts the race. <i>Use a two-point stance for your start.</i> <p>This will give you the best line of sight to your "Go Mark" Increase go-mark distances as you progress through your season. Peak!</p> <ul style="list-style-type: none"> • Stand in front of the line marking the zone, not on or behind it. Possible DQ. • Make the incoming runner catch you. Position your feet for a fast takeoff and good line-of-sight to your "go" mark. • Trust your mark and accelerate 100%, no holding back. (In the 4 x 200 relay, hold back — go at 75%-85%, depending on how strongly the incoming runner finishes a 200m run). • When you hear your incoming teammate give the verbal command, extend your arm straight back, horizontally, with the palm up, fingers together, thumb extended making a V-shaped target for the pass. Hold steady by pushing the upper arm inward towards your spine. Don't turn your head or look back; remember, it's a <i>blind exchange</i>. See Rule 1. • When you feel the baton, grasp firmly and fly. <p>-----</p> <p style="text-align: center;"><i>Pass fast, Pass safely, Pass ON!!</i></p>

who may have trouble visually seeing the marks clearly, I will use a verbal start cue to be sure we get the steps done properly.

What are some teams both nationally or internationally that routinely produce excellent relay racers? (you can reference high school, college or international)

CSG — There are several teams that routinely produce excellent

relays. But from year to year it changes.

GG and DW — If you asked this question 10 years ago it would likely only be a handful. Now there are so many teams and countries that produce excellent relay runners. Obviously in Canada we pride ourselves on producing good relay teams. Some countries that have been very consistent in terms of relay skills over the years include

Japan, Brazil and France. In terms of the collegiate system, there are a lot of great relay programs and we have seen a lot of good relay runners from the SEC (LSU, Texas A&M, etc.) and some Pac-12 (USC).

BJ — America—club, school, college.

DG — Russ, I am afraid my only contribution here would be to plug high schools I have coached to state

4x1 relay championships and The U.S. Naval Academy at Annapolis.

JB — Firstly, on the high school teams, Jamaica has excellent relays teams; Calabar boys, and Edwin Allen High girls. Colleges: Florida men, LSU men and women and Texas A&M women consistently produce great sprint relays. International—Jamaica women, USA women and Great Britain women have been the most consistent over the years, advantage to USA. Jamaica men over the Usain Bolt era. The men dominated for long time, but not recently.

The whole “interchangeable parts” idea with the U.S. national team relays doesn’t seem to work very well. Do other national teams do this? I understand the thought to spread the wealth and “save” the best for the last race, but it doesn’t always work out that way. Is the main concern injuries, ego or giving the upcoming talent experience or some combination?

DG — To the best of my knowledge, no other national teams use substitutes for the 4x1 relays as much as the US does. For the three 4x4 relays interchange all you want! The main concern is more medals and a paycheck for the subs. The more-the-merrier approach for the U.S. is SOP. Jamaica is the only other country that freely substitutes legs for their 4x1’s. In the Tokyo Olympic men’s 4x1 final no teams used a substitute in the qualifying.

CSG — I am not certain what other national teams do. I just know with my team I prefer to keep the relays the same as much as possible because the more we hand off with the same order the faster we become and we don’t have to keep

reinventing the wheel in terms of finding out what steps are best for each person. The U.S. team has an interesting dilemma every year because anytime you don’t have people that practice together at the same time all the time you’re going have to make decisions at the last minute and it’s a tough situation.

BJ — Personnel on team determine tactics.

GG and DW — A lot of countries do not have the talent that the USA has in terms of sprinting, so this doesn’t necessarily come in to play. Changing the order of athletes just to give someone else a chance can be a risky play. However, with the relay, things ultimately come up and throw a wrench in your plans, whether that’s individual athletes competing right up until the relay, injuries, or something totally out of the blue. If we feel we need to make a significant change in the relay, we will do an analysis of how the change will affect the race as a whole and at each zone. If the benefit outweighs the cost, then we will make the change. In Canada we always try to have Plan A, B, C and sometimes D.

JB — Very good question; yes, I think teams change personnel, so I don’t think that’s the only problem to the equation. The bigger problem is lack of training time with teammates. When you have people from four training camps coming together in the greatest pressure situation, mistakes happen. Look at the world record Jamaica team; runners from two training camps made up the team: lead off to second practice at the same place and third to fourth at same camp. So, familiarity and cohesiveness were there. They bridge the gap between second

and third and they are good. So I think geography and time spent practicing is more of a problem than “interchangeable parts.”

In a perfect world what would be your recommendation for creating an unbeatable 4x1 relay team?

GG and DW — This is a bit of a double-edged sword. If you have a team that consistently trains with each other, you lose out on the individuals getting faster by competing individually. If you have a team of incredibly fast athletes, they will be unavailable to train relays as they will have other commitments. I think that having an adaptable program that is built on solid relay foundations will ultimately serve you the best.

BJ — Get the four fastest runners who are comfortable with each other.

JB — In a perfect world, it’s the four fastest humans. Not so easy though. You must select the four best runners/sprinters and place them according to their strengths and at times strategize to beat your main opponent. In a nutshell you must have each runner in correct order. Coleman, Ronnie B., Fred K., and Noah L. These four can be unbeatable. Find the best way to maximize each runner and legs.

DG — Sweep the 100m final, maybe have 2 or 3 current and former 100m world record holders on hand; run two or three practice competitions; adjust the “go marks” as needed (necessity is the mother of extension); have a nice dinner together the night before; and Viola! An Unbeatable 4x1 Relay! But only if they execute.

Are there any drills or video references you are particularly fond of?

GG and DW — In Canada we really try to keep it simple- We focus on the basic fundamentals of relay running and try not to deviate from basic principles; so we have always use Gerard Mach's basic approach.

DG — In all honesty, I am not big on drills, especially the drill with the runners standing still and swinging their arms in unison and tapping the hand several times. Or the jogging around the track, all four in a row passing the stick in slow motion. In *Track Coach* #174, readers can find my favorite drill for big-meet preparation. As I explained earlier the best practice is doing the exchanges full speed

with all four runners participating.

JB — I like blindfold seated and standing exchanges. Helps with trusting and judging the hand placement.

BJ — Warm up and warm down with athletes exchanging baton with as much precision as they can muster.

Is there anything else you'd like to add?

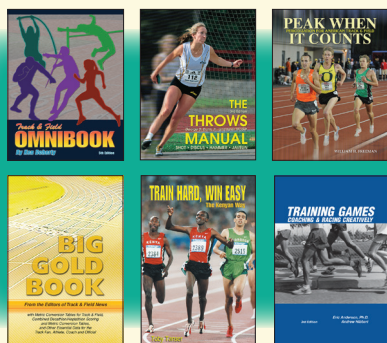
GG — I think that one of the main reasons that Canada has been successful as a country in the relays is that we have a solid relay program that has adapted and evolved over the years. I think we excel at mixing sport science and the art of coaching very well and one does not outshine the other.

DG — How difficult is a 4x1 exchange? Slightly more difficult than a handshake and about the same degree of difficulty as a PAT in football. I want to thank USATF Coaching Education for the excellent instruction and schools they provided. And finally, Russ, thank you for another fine Roundtable discussion!

JB — Relay runners must be aggressive in nature and have a special love of winning, must be able to take chances at pushing the exchange barrier, can't stay in the comfort zone if they expect to win the 4x100 relay. Coaches must teach relay runners to live on the edge of running away from the incoming runner.

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TRAINING HIGH VELOCITY HURDLING

Coach Thorson examines some of leading factors that research reveals hurdle coaches should be utilizing in their training to develop “fast” sprint hurdlers

*BY MIKE THORSON, FORMER DIRECTOR OF TRACK & FIELD/
CROSS COUNTRY AT THE UNIVERSITY OF MARY IN BISMARCK ND*

The real secret to self-evaluation is honesty and a sense of self-awareness. Admitting that there may be a better way to do something can be exceedingly difficult and oftentimes a painful process for many coaches. There are coaches who train “sprint” hurdlers (100 and 110m hurdlers) who likely need to step back and re-evaluate the training processes they are administering. Often in the past coaches trained short hurdlers much like they did their sprint group. Not that this was all bad. But quite often another type of speed was neglected. Or perhaps not emphasized enough is perhaps a better way to put it.

The speed we are referring to is commonly known as **Hurdle rhythm**. It isn't that **speed** is not a key ingredient in the success of

a hurdler. It is critically important. Crucial. Most world class hurdlers could very well be elite sprinters if they chose that discipline. But before we get into the specifics of hurdle rhythm, coaches must ask themselves the three elementary training questions before they make any kind of changes to their training program(s). 1. **What** type of training will they use 2. **How** will they implement the training 3. **Why** are they doing the training they are doing. The coach must always understand *why* they are doing what they do and convey that to the athlete (s) if they expect a “buy in” from the athlete and training group. Communication, trust and transparency are always keys to any successful coach/athlete relationship. Knowing the X's and the O's are great, but coaching is about relationships.

Once a coach has arrived at the answers to the question of why, it is much, much easier to evaluate a training program and ask the following question: “How can the training program be improved?” How can the training program be elevated? Should you continue down the same path, or build on the past and make changes for the better leading into the future. Dr. Ralph Mann, one of the world's foremost bio mechanists and a former world class 400-meter hurdler, would tell many hurdle coaches that there are three areas which should be of concern that could likely be addressed. Not that these are the only ones, but Mann has identified three major coaching issues regarding the training of sprint hurdlers:

1. The noted bio mechanist says the importance of the start is

- too often ignored.
2. He also says hurdle training has been dominated by sprint training. A notable Mann quote sums this up best: **“The hurdles are not a sprint.”** Sprint stride lengths are not possible in the hurdles due to standard spacing and restrictions. We have often heard of coaches referring to the men's strides in the hurdles as a *gallop* or a *shuffle*. Not a sprint. They are not true sprinting strides. The only real opportunities to sprint in the short hurdles are the start to the first hurdle, and the sprint to the finish coming off the last hurdle. And most coaches would argue a hurdler can't even utilize all of their speed in those areas. A hurdler can generate approximately only 75% of their sprint velocity in the hurdle race, according to analysis by Mann.
 3. The mechanics and training of the strides between hurdles and the hurdle clearance stride have been ignored, he said.

Mann's research has revealed that coaches should address four aspects to develop successful hurdlers:

1. Minimize the time from start to takeoff to first hurdle.
2. Minimize hurdle clearance time
3. Minimize time for the three steps between hurdles

Employ proper mechanics to obtain the most from the hurdle clearance. We have addressed many of the concerns in our sprint hurdle training program that Dr. Mann has outlined in his work and made changes throughout the years. Our objective for this article is to convey to coaches what has “worked” to develop “fast, maximum velocity” short hurdlers at the University of

Mary in Bismarck, ND. Will it work for everyone? Likely not. Coaches should never expect to grab another coaches' training program and copy it verbatim. It doesn't work that way. The program that Clyde Hart devised for Michael Johnson likely won't work in your setting with your athletes. Coaches must know the context and adapt any training program to their own environment and athletes. Too many coaches expect to open a book and discover paint by number training programs. We have always felt coaches must always individualize and customize their training programs to meet the needs of their athletes. We haven't discovered any secrets. There are very few secrets, if any, in training. **But what follows in the different sections are items on our training menu that we have used to improve and develop our 100 and 110m hurdlers. Our training is based on research, and science-based principles by some of the leading coaching minds in the world. We have added our own personal artistic touch to make it work in our setting.**

SPEED/FORCE PRODUCTION

Hurdling is not a sprint, as Dr. Mann will tell you. But let's not kid ourselves. Speed is a critical, crucial factor in successful sprint hurdling. There aren't any “slow” hurdlers who do well. But some coaches have perhaps been a little overzealous on the sprint side. Some coaching authorities would say there has been a misplaced priority on treating hurdlers as sprinters, opposed to training a substantial percentage of hurdle rhythm. It is imperative to keep this mind: **Success in the hurdles is determined by the ability of the athlete to generate great**

amounts of explosive strength at exactly the correct time—timing is critical.

A Dr. Mann statement that coaches should always keep in mind: **“The athlete that can produce the greatest amount of horizontal velocity and maintain it over and between the hurdles will be the most successful.”**

To obtain the above horizontal velocity that is needed to be successful sprint hurdler, speed, strength, speed endurance and power must be trained. Much the same as a sprinter. The maximum horizontal velocity that a hurdler can produce is highly dependent on the amount of effective force that they can apply during ground contact. Just as in the sprints, force production is huge component of successful hurdling. There are obviously many commonalities between sprinting and hurdling. Consequently, a coach who does not train hurdlers using many of the sprint mechanics and components of sprint training is doing the athletes a great disservice. They are certainly not meeting the needs of hurdlers to perform at the highest levels.

A critical area that is shared by both the sprinter and the hurdler is **front side mechanics**. Your best elite sprinters focus their efforts on leg action that takes place in front of the body, thus the name front side mechanics. The same is true of hurdlers as it is for sprinters: Maximize front side mechanics and minimize back side mechanics. An emphasis on front side mechanics is extremely important for the hurdler due to the increased demands for the athlete to project the body over the barrier.

The bio motor qualities such as



flexibility, coordination (balance), endurance, speed and explosive strength are all essentially the same for both a hurdler and a sprinter. Coaches should be mindful too, of the fact too that there is a substantial difference between hurdle heights for men and women and it should be trained accordingly. A larger percentage of training time for men in our program is devoted to hurdle rhythm due to the hurdle height than women where the 33" hurdles are much more of a nonfactor.

To answer the frequently asked question of what we train more—speed or hurdle rhythm? Our answer is two-fold. It depends on the gender, and it depends on the athlete and their needs. The reality is, **we train a combination of both speed and hurdle rhythm for both males and females.**

HURDLE RHYTHM/ HURDLE SPEED

Many coaching authorities, and certainly Mann, will tell coaches that a substantial percentage of training time should be devoted to hurdle rhythm, or what some coaches term "hurdle speed. What exactly is **hurdle rhythm**? A definition from the late master Canadian hurdle mentor, Brent McFarlane: "**Rhythm is the speed which allows hurdlers to use their techniques to the maximum.**"

McFarlane always said that most hurdle authorities place rhythm ahead of sheer speed as their goal for their training programs. **The goal of our program is at the University of Mary was to rehearse over and over as many quality repetitions as possible at competition speed—race speeds! The training variables must be manipulated and managed to obtain the competition speeds in every hurdle session where the objective was hurdle speed.** Coaches are not meeting the demands of the race if they are not

mimicking race speeds in training that their athletes will execute in competition. By no means, however, do we neglect maximum velocity speed. It is a vital component in our training program and works hand in hand with hurdle rhythm.

Some of the strategies that our program uses to achieve the goal of competition hurdle speeds in training:

1. Speed is a product of specific, rehearsed neurological skill patterns. So are the hurdles. Most coaches will acknowledge there is a 5-10% drop off in intensity in training compared to competition. It is the coach's job to manage and make allowances in the training environment to establish the race speed motor patterns despite the intensity decrease. One of the best methods is to use **discounted spacing** and **reduced hurdle heights**. Discounted spacing for college men can be 8.5-8.8 meters between hurdles. For



college women, 7.8-8.3m. Most of our women's hurdling is done at 30."The men vary from 33-42 inches. We obviously at times use the standard height of 33" for women and 42" inches for men. Many coaches will argue training with the 42's forces the male hurdler to clean up and improve their mechanics. We would agree that it can for the more talented athletes. It typically is a detriment for combined events athletes and less talented hurdlers. It is rare we use the **standard spacing** for either the men or women, except for the first hurdle. Unlike some programs, we rarely if ever change the first hurdle mark. We deem the first hurdle takeoff as too critical to tamper with and the resulting "mental issues" of switching and making corrections. Marks between hurdles will obviously have to be changed and re-coordinated as

the season progresses and the athlete improves and becomes faster.

2. Increased velocity between the hurdles can be trained by moving to 5 steps between hurdles. The distance for men is 13 meters between and 11.5 meters for women.
3. We very seldom have athletes train over hurdles solo. It is exceedingly difficult train race speeds unless athletes are placed in a **competitive** situation where they have to compete head-to-head.
4. *Athletes should be basically fatigue free and fully recovered prior to hurdle sessions where the objective is competitive speeds and the coach is training hurdle rhythm. Touchdown times should be very, very closely monitored and the session immediately curtailed if the times begin to drop off. **Fewer repetitions** with large amounts*

of recovery that stress quality is the key. Our training philosophy is always **quality over quantity**. Recovery between hurdle reps can vary from 10-12 minutes or more. Our rule for recovery is 1 minute per hurdle, with the men sometimes receiving more due to the energy requirements of clearing taller hurdles. Our goal is to not exceed **90 minutes** per session, with the maximum being two hours. It is always good to remember that athletes can only be stressed at the highest levels for approximately **3 minutes per training session**. **With that in mind, we always stressed "quality reps" with the goal of reducing velocity fatigue.** The old cliché' is certainly true: "Practice makes perfect only if practiced perfectly. Athletes who practice or learn skills incorrectly are rehearsing skills perfectly wrong. Most coaches understand how

difficult and time consuming it is to “undo” poor or inadequate motor patterns.

5. The **optimal** speed training environment occurs in **races** because you eliminate many of the limiting factors that the athlete encounters in training. Competing often and using your competitions as your **ideal** training ground is an excellent recipe for success. Nothing you can do in training can compare with the benefits you obtain from competition. Some coaches would say too many competitions can cause premature peaks, burnout, and cause the athlete to run fast too soon. We would say peaks and burnout are the result of outside factors other than training and competition. We would also say you can’t run too fast too soon. We would encourage coaches to get their athletes to run fast early and build on it. There is no good reason to “hold back” if the athlete is healthy.
6. A sizeable percentage of training time is devoted to the start, acceleration training, and the teaching of the proper high velocity sprint mechanics. “Athletes are only as fast as their mechanics will allow,” was a motto we constantly used with our athletes. Our program was in a constant search for improving maximum speed because improvement in that area will enhance acceleration and sub maximal speed. Ultimately, it will improve hurdle speed. And obviously, that was our overall goal.

MECHANICS/HURDLE STRATEGIES

The challenge that faces short hurdlers is to generate and maintain

horizontal velocity while clearing 10 barriers, and recovering from each effort to maximize the three steps in between each hurdle. The hurdler who can produce and maintain the greatest amount of horizontal velocity will be the most successful. The hurdles obviously will cause the athlete to deviate from normal sprint mechanics. And it is imperative that the amount of alternation be minimized, and the front side mechanics maximized.

Of all the mechanical factors, it is the decreasing of the ground time that determines elite performances, according to Mann. He also points out that it is the ground phase that is the only time that an athlete can apply force, and this is when the great hurdle results are produced. Ground time is dependent upon how quickly the hurdler can achieve the ground forces to project the body into and over the hurdle.

To sum it up, success in the hurdles is really determined by decreasing airtime over the barrier and ground contact time going into the barrier. The proper execution of the three steps between the hurdles is crucial to running fast hurdle times. The first step, termed the **Fall step** and the shortest of the steps, is used to recover from the clearance and control the descending body while maintaining horizontal velocity. It is the second step, called the **Shuffle step**, which is the longest and sets up the hurdler for the next barrier. It is the only step of the three that can regain or exceed the velocity that was lost in the hurdle clearance. Step three, commonly referred to as the **Prep step**, is the step that prepares the hurdler to attack the next hurdle clearance in the best possible body position.

The body position of the hurdler coming off the hurdle is extremely important. The athlete must be very balanced, very precise, and very sound mechanically if the athlete is to control the transition from vertical back to horizontal emphasis and prepare for the all-important middle step. This is the most important step and can lead to an inferior performance much more dramatically than the others.

The takeoff position and location in addition to the touchdown distance should be constantly monitored, as they dictate a great deal of success for the hurdler. The objectives of the three steps include:

1. **First Step**—Stop the fall of the hurdler as they come off the hurdle and prepare for the middle step while maintaining as much horizontal velocity as possible
2. **Second Step**—Produce the horizontal velocity to regain or exceed what was lost during the hurdle clearance, and generate sufficient vertical effort to create the stride length needed to properly prepare for step 3
3. **Step Three**—Maintain horizontal velocity while preparing the body position for the next hurdle stride

It is very obvious that a substantial percentage of time should be spent in developing the proper three-step model due to the likelihood of error on the part of the athlete. Some of the major mechanical flaws that we have encountered include: (1) Hurdle clearance issues—too far away or too close on takeoff (2) Balance and arm mechanic problems typically resulting in unwanted, excessive lateral movement and motion (3) Inconsistent takeoff approach (4) Athlete getting out in

front of the center of gravity and causing braking effects (5) Reaching and over striding resulting from a failure to maintain horizontal velocity (6) Failure to use arms to maintain hurdle velocity and speed through the hurdle clearance (7) Failure to maintain front side mechanics. (8) Too much airtime on the hurdle clearance due to poor touchdown position, poor body position on top of hurdle, or dropping the center of gravity and one of the body segments being too low when the hurdler reaches the hurdle (9) Diving with the upper body into the hurdle, causing an over rotation of the body. We are just touching on a few of the mechanical issues. That being said, however, it is very clear that poor mechanics can be a very limiting factor. It also is very obvious that mechanics can be an immensely powerful tool if the hurdler places the body in the correct position, at the proper time, in the right direction, and at the correct speed.

There is a reason we have listed hurdle clearance issues as the number one flaw, as it is hurdle clearance that is paramount to success. Three factors coaches should note in the hurdle clearance: (1) The take-off distance affects the angle of travel (2) The angle of travel determines touchdown distance. (3) Distance in landing affects speed to the next hurdle and time to takeoff for the next barrier

FIRST STEP MANAGEMENT

Unlike the sprints where all the strides can potentially add to horizontal velocity, only about 40 percent of the total strides in a hurdle race can accomplish that. Our objectives for the start to the first hurdle:

1. Minimize the time from start to the first hurdle and place the

hurdler in a position to have a successful hurdle race.

2. Reach the correct take-off spot on a very precise, consistent basis with the body in position to execute the mechanics of the hurdle clearance correctly.
3. Build the highest horizontal velocity possible in a very explosive, but controlled manner to the first hurdle utilizing the proper front side mechanics.
4. Employ the sprint start mechanics and sprint strides for the first three steps (possibly four for some athletes).

One area that should be addressed is how many steps the hurdler will use to approach the first hurdle. Should the athlete use the standard 8-step model, or the 7-step approach employed by many of the world's best hurdlers? The 7-step model is certainly not for everyone. The candidate should be a taller, extremely talented athlete with excellent speed. It should be an athlete who is a 13.5 male hurdler or better, or a 12.7 hurdler or better for female hurdlers, according to Dr. Mann. That in itself limits the field considerably. Merely getting to the first hurdle faster should never be the end-goal. The coach should enact the model that allows the athlete a great first hurdle takeoff and clearance, and sets up the race in its entirety to be successful.

BREATHING MODEL

A breathing model pattern by the athlete can certainly contribute to the enhancement of sprint rhythm maintenance for the hurdler. The hurdler will establish a specific pattern of breathing in the race, with the hurdler "blowing out" on hurdles 1, 3, 5, 7, 9, and holding the breath the remaining time. The athlete

should hold breath in the blocks into the set position. Many elite hurdlers use a pattern of "blowing out" on hurdles 1-4-7-10. Holding your breath creates what is known as the Valsalva maneuver, which research shows increases blood pressure in the carotid artery, facilitating motor unit availability/recruitment. It is important to "recharge the system" because studies have shown that sustained maximum motor firing can last for only approximately 2 ½ seconds and that is in very elite athletes. It also increases intracranial blood pressure in the carotid artery, resulting in improvement in the athlete's ability to recruit motor units. To put it simply, holding your breath increases your ability to put great force into the track. It will likely take many rehearsals by most athletes to perfect the art of breathing to obtain the maximum effects. It is typically wise to invest in a progressive breathing plan, starting with one or two breaths in a race and progressing from there.

DRILLS

There are mixed feelings on the importance of drills. Some coaches feel they are essential. Others, like ourselves, would say drills can be important and immensely useful at times. But it is our feeling that there are a lot of coaches that over drill. We don't question that drills can be vitally important, especially for men who are faced with clearing 42" barriers. But only meaningful drills that serve an actual purpose, and have the highest degree of transfer to competition should be included on the training menu. Anything else is quite senseless and actually taking away energy that the hurdler will need for far more important training. Ludwig Svoboda, a hurdle coach from the Czech Republic,

said it best when he concluded that “many of the common hurdle drills develop a technique that is useless in maximal speed performance.” As Vern Gambetta, a noted training authority who is considered the “Father of Functional Training,” and one-time track and field coach, often says, “Do the things in training that you need to do. Not what is nice to do?” Maximizing energy and organizing the training to obtain the utmost benefits from the amount of energy expended should be the goal of every coach. In other words, cut out the “fluff.” Do drills that are productive and lead the athlete to be “fast.” Period. Our program emphasized a limited number of drills, and they were all fairly simple *over the top of the hurdle drills*. Most of the slow action drills that isolate one side were removed from our repertoire. Some of the drills that the Mary program found useful with a brief explanation include:

@@Arm Drills Any number of lower hurdles (30’ or lower for women; 36” for men or lower if needed) can be used for this drill at reduced, discounted spacing (28 feet or 8.53 meters for men and 7.0-7.5m meters for women, although spacing is not critically important because the drill is done at very controlled speeds. The drill is misnamed in that the athlete must hurdle at slower speeds **without** using the arms. There are three versions: 1) **Regular** Athlete hurdles from a standing start over any number of hurdles with the arms extended out in front of the body in a locked position. 2) **Fly** Same as #1 except arms are extended like wings 3) **Chest** Same as 1 and 2, except arms are held tightly folded to the chest (Helpful if the athlete grabs shirt) 4) **Medicine Ball** Same as 1-3, except the athlete holds a medicine ball extended out in front

of them as they clear the hurdle. Women use a 2k ball and men 3k. Coaching cues: Emphasize leading with the knee, squaring up hips and shoulders to the hurdles, and letting the body balance itself without the use of the arms. It is a great drill to teach body awareness and balance to eliminate rotational, lateral motion problems. The arm drills are typically done in flats and usually involve no more than 3-4 hurdles.

@@One Step Hurdles From a standing start on the start line, hurdle any number of hurdles spaced so that the hurdler has only 1 step between hurdles. The 1st hurdle can be on the standard mark and others spaced at low heights spaced 12-13 back-to-back steps for both men and women. Coaches will likely have to experiment with the spacing depending on their individual athletes and abilities). The drill teaches athletes to lead with the knee, with a flexed lead leg, projecting the hips through the hurdle, and getting down very quickly with an active trail leg. It is also useful to eliminate the “swinging” of the lead leg. The drill should be done in spikes at controlled speeds, with an emphasis on arm speed and driving through the hurdle. We use anywhere from 4-12 hurdles, increasing the number of hurdles progressively throughout the year. The drill can also be done in shuttle fashion, with hurdles going down, and then the athlete returning in the opposite direction. The arms drills can also be done in shuttle fashion.

TRAINING DESIGN/ ENERGY SYSTEMS

It can be particularly challenging for the hurdle coach to set up a program for an athlete that competes in the 100m or 110m hurdles. A lot

of coaches know what should be trained. But they do not know how to put it all together into a nice, neat package that meets the needs of their athletes and their training groups. To put it another way, they have all the ingredients, but they don’t have the correct recipe to “bake the cake.”

It can be very difficult to design a training program for a sprint hurdler that includes all the different components and energy training systems that are needed to be successful. Brewing up a mixture of training that prepares the hurdler to negotiate 10 barriers outdoors, and at the same time, train the proper hurdle rhythm can be extremely difficult. Balancing training loads and building **recovery** into the program that allows for the hurdler to train **fatigue-free hurdle rhythm and maximal velocity speed** can be a difficult endeavor.

It is widely accepted that the 100m/110m hurdle events have the same energy requirements as the 200 meters. Thus, the coach will be designing and implementing training from all the different energy systems: (1) Speed (2) Speed Endurance (3) Special Endurance 1 (4) Special Endurance 2. Stephen Francis, the famous Jamaican coach, puts it in to perspective when he says, “A female athlete who is looking to run 12.90 in the short hurdles should be capable of running 38 seconds in a 300-meter time trial. That is he said, assuming the athlete can sprint 11.70-12.00 in the 100-meters. Francis went on to say that a hurdler with a goal of 12.3-12.4 should be able to negotiate 300 meters in 36.0. Those are world class times. You will likely have to be drawing from all the different energy systems to achieve those types of performances. It very likely

explains why some hurdlers who do very well indoors with five hurdles are not nearly as good when they move to the longer outdoor event that requires more speed endurance. It is indeed a “tall task” to arrive at a program that blends all the needed ingredients into a successful training program for the sprint hurdler. But it is obviously very doable. One needs not look any further than the American and World performance lists to see that many coaches are doing it very well and very successfully.

STRENGTH/POWER

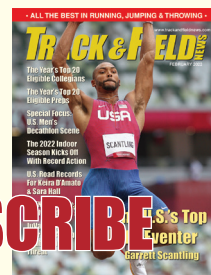
A hurdler must have a great deal of strength and power to possess the “hurdle endurance” to produce the hurdle rhythm and time for each stage of the 10-hurdle race. The Mary competition in-season strength program emphasized a minimal maintenance program that was based on functional training principles and that did not detour the quality training needed on the track. It was strength training that had a high degree of transfer to the actual explosive movements that the athlete would utilize and need on the track. We also looked at the strength program as an essential tool in injury prevention. A typical week with competition would include only one traditional strength day in the weight room, and as noted, was strictly maintenance. This was supplemented with core training, balance training, resistance work, plyometrics, circuit training, and other forms of functional training. We were firm believers that not all strength and power work had to be done in the weight room. The off-season (Fall training—September through December) was the real time to build strength and power.

SUMMARY

The purpose of this article was to share what our program at the University of Mary evolved into as far as developing “fast” hurdlers. I say evolve because it was a constant process of evaluating, adapting and changing the program to meet the needs of our athletes. We noted earlier that the program quite likely would not work for everyone. But with some personal tweaks and modifications, it will work for a lot of coaches and their hurdlers. Coaches will have to understand, as with any training program, it will take patience, time and consistency with the training to obtain high level success. That is typical of any training program that you implement. Coach Gambetta perhaps says it best: “Today everyone desires novelty and constant stimulation. Running around and constantly switching what you are doing from one day to the next is currently what is in vogue. But if what you are after is long-term growth and development, speed and switching just doesn’t work.” In other words, coaches need to develop a training plan and stick with it. Use research, science and practicality to make the necessary changes when needed, and then see it through. Coaches and athletes alike will see results. Remarkable results.

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TRAINING TO JUMP HIGHER

Huge forces need to be overcome in milliseconds to launch the high jumper skyward and over 2m for elite females and 2.30m for their male equivalents. John Shepherd looks at the type of training needed. This article is adapted from *Athletics Weekly*, August 15/20/2019.

BY JOHN SHEPHERD

There are a number of ways in which a high jump athlete can develop takeoff power—these include weights, plyometrics, complex training (combining weights and plyos into a workout) and ballistic training.

BALLISTIC TRAINING

In *New Studies in Athletics*, Jurgen Schiffer from the German Sports Laboratory in Cologne says: “When plyometric drills are combined with a traditional resistance training program, vertical jump performance appears to be enhanced to a significantly greater extent than if performing either resistance training or plyometric training alone.”

Ballistic training involves performing jumping exercises with added weight. Simply put, the athlete

jumps whilst carrying weights or wearing a weighted vest. To be at its most effective the added resistance needs to be around 30% 1 rep max. A typical exercise could be a succession of double foot vertical jumps performed on the spot. More on ballistic training for the high jump later.

What of the other options available to the high jumper? Heavy weight training is traditionally used to develop power. However, due to the force and velocity components this may not actually be that effective, particularly for the relatively trained mature athlete.

One of the reasons for this is the time it takes to move a weight—this will be much slower than when compared to, for example, the time

needed to apply force to the take-off in the high jump (milliseconds compared to half a second or so for the performance of most standard weights exercises). Additionally, and perhaps more so than any other event, power to weight ratio is crucial for the high jumper, and weights, when not monitored, can increase muscle mass and therefore add body weight. More weight that needs to be lifted over the bar.

Gains will be large when starting any relevant high jump conditioning program for the first time and this does include weights. And in all likelihood vertical jump and sprint speed may improve because of this.

However, these gains will begin to reduce over time and it's even possible that rate of force produc-

tion may decrease should weights be continued without thought being given to the speed at which force is needed to be generated and by the use of more specific training means and a harmonized training program.

Schiffer points out: "This is supported by a number of studies that showed improvements in vertical jump performance in novice or recreationally-trained individuals after heavy resistance training programs but limited improvements in individuals or athletes with substantial resistance training experience."

He then notes—and to further substantiate the merits of ballistic training—that research on this methods indicates, for example, that it can improve power production even in trained athletes.

The high jump is one of the jump events where ballistic training is particularly recommended. The approach speeds (see box) are much slower than those required for the long and triple jump, thus potentially the athlete has more time to impart vertical force on ground contact.

Also, the direction of this force requires a powerful vertical velocity (in the long and triple jump the dominant velocity component is horizontal). Thus, leaping upward with resistance would appear highly relevant to the high jump.

PLYOMETRICS

As noted, when an athlete becomes highly trained, then pursuing further weight training gained strength is tikety to have fewer and fewer returns. Schiffer argues that it is "during this period that the inclusion of ptyometric training may have its most profound effect".

Speed versus power high jumping

Power flopper	Takeoff speed	7.8-8.4m/sec	Ground contact	0.13-18m/sec
Speed flopper	Takeoff speed	6.5-7.5m/sec	Ground contact	0.17-0.21m/sec

So, what could constitute the best plyometrics for the high jump? Considering the need for a near straight takeoff leg then perhaps drills which use a 160-170° angle. Schiffer describes a suitable drill.

THE HIGH JUMP IS ONE OF THE JUMP EVENTS WHERE BALLISTIC TRAINING IS PARTICULARLY RECOMMENDED

This can be accomplished with boxes no higher than 15cm to 20cm with the jumper standing on the edge of box No 1 on the toes with both feet together. A little forward momentum and as the jumper leaves the box, the legs are prestretched and the jumper lands on the toes, knees held tightly at about 170 or 160°. The jumper pops (or explodes) up onto box No. 2 as quickly as possible, landing on the toes; forward lean, drops down on to the floor and pops back up on to box No.3, repeating for box No.4 and No.5."

The expert stresses that the key is to jump and rebound as quickly as possible without significant bending at the knee.

It is also advocated that the scissor technique can, in the context of this article, be considered as a highly relevant ptyometric drill, as it creates the takeoff characteristics needed by the flop-style jumper—that's to say, not leaning into the

bar, a near straight teg plant and a fast swing up of the free leg, for example.

THE ROLE OF THE ACHILLES TENDON

Tendons as well as muscles (and other soft tissue, such as ligaments and fascia) also play a role in being able to jump—high or long. Tendons are literally springs which connect to muscles—the most well-known example being the Achilles Tendon. And the Achilles is crucial for all jumps (and running) in terms of power production.

Shorter, stiffer Achilles tendons have been shown to be able to generate more force, more quickly than less stiff longer ones. Olympic gold medallist Stefan Holm of Sweden featured in a research documentary which had his jump physiology studied, where the power of his short Achilles was seen to be fundamental to his ability to jump so high (2.40m PB). In fact, it was discovered that it took a force of 1.8 tons to stretch Holm's left Achilles 1cm.

Sports scientists have found that even within jumpers the Achilles tendon of the jump leg is stiffer than that of the non-jump leg. Research with collegiate long and high jumpers indicated that the jump leg had 24% greater Achilles stiffness than the non-jump leg.

Further research has identified that the triceps surae (muscles that run into the Achilles in the lower leg)

also develop in conjunction (or vice-versa) with increases in Achilles tendon stiffness. Thus, the soft tissue of the lower leg becomes stiffer and is able to generate and return force in a superior way when subject to relevant training, such as the plyometric drills and ballistic training indicated previously. This would also apply to the stiffness of the knee and hip.

ECENTRIC ACTIVITY

As indicated, taking off on a near straight leg in the high jump means that the soft tissue of the leg is prestretched/pretensed. This affects the eccentric (lengthening muscular action) portion of the plyometric stretch/reflex and the resultant rate of force development.

Much research indicates that plyometric training enhances the stretch reflex and leg stiffness and the eccentric capacity of the jumper. Research in the *Journal of Strength and Conditioning* indicated "that a significant increase in concentric vertical jump performance is associated with increased levels of pre-activity and eccentric phase muscle activity." And, this is an additional benefit of ballistic and plyometric training, teaching the neuromuscular system to be able to automatically "set" it itself to fire

the stretch-reflex optimally.

There are obviously a number of ways in which to condition the optimum high jump takeoff and this will depend on the maturity of the athlete and whether he is a speed or a power flopper. However, it would seem that ballistic training and plyometrics when combined and working, particular

with very shallow knee angles (while developing leg stiffness and improving the neuromuscular qualities of the stretch-reflex and Achilles tendon stiffness) will prove beneficial, whilst being mindful of the potential limitations of weight training, particularly for those who have weight trained relevantly for a number of years.



VICTOR SALIER

Cuba's Javier Sotomayor still holds the high jump world record. His 2.45 (8'1/2") WR was set in Salamanca, Spain, in 1993.



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USATF COACHING EDUCATION INSTRUCTOR SPOTLIGHT

An interview with Scott Christensen, Head Coach, Stillwater High School (MN)

Scott Christensen is a 17-year USATF lead instructor for the Level 2 Program (Endurance) and a highly sought clinician across the U.S. Christensen is also a lead instructor for the USATF Cross Country Specialist Course and a regular Level 1 instructor. He has led Stillwater High School to national top 10 rankings eight times since 1995. Four Stillwater alumni have gone on to break 4:00 in the mile after leaving his program. Christensen was a 2003 USA Junior Team Leader and 2008 USA National Team Leader at the World Athletics Cross Country Championships. He is a past chairman of the USATF Coaching Education Executive Committee and was re-appointed to the committee in 2021 as the physiology lead. Christensen was honored with the 2020 Kevin McGill Legacy Award for his passion and initiative in coaching education across his career.

MR: Scott, thank you for agreeing to be a part of our second feature. Why don't you start by telling us how you got started in coaching.

SC: My personal story on how I first got into running and then coaching is pretty simple without much drama. On the last day of school of my 9th grade year, my science teacher who I really liked, stopped me, and asked if I would be interested in joining the high school cross country team the following fall. I did not even realize he was a coach at the time. I asked a couple of athletes about it and just like that my decision was made. I ran three years of track and cross country in high school and four years of the same in college. I soon thereafter ran 25 marathons, and still in fact, run 40 miles per week some 45 years after that day in science class. My coach is a sensational man. I had loving and caring parents, so I was not looking for a surrogate for them. I realized at the time what an important niche a coach fills in peoples' lives. I considered many college majors and career paths like medicine and dentistry when I was 20 years old. My thoughts kept coming back to science teaching and track coaching. I wanted to do with others what my coach had done for me. My mom cried when I told her my career decision. She was a teacher and felt I was way too quiet and introspective to handle a classroom. I guess I proved her wrong.

MR: You have been a long-time instructor for USATF Coaching Education and helped shape programming through your work on the executive committee and were instrumental in the creation of the USATF Cross Country Specialist Course based on the work of USATF Legend Coach, Dr. Joe Vigil and that launched in 2016. When reflecting on your contributions to coach education, what is an evolution or accomplishment you are most proud of?



Scott Christensen

SC: I am a scientist above all else. My coaching and teaching are an offshoot of that, not the other way around. Science is broadly-based on three principles, 1. elimination of variables, 2. replication of data, and 3. transfer of authenticated knowledge. That is how I operate, although our society does not function quite this way. When USATF began using the motto: athlete centered, coach driven, and science based, it resonated with me. It completely described my way of thinking. When I saw that scientist-coaches were developing a coaching education program in the mid-1980s I was intrigued. I saw a data driven education program that emphasized individual development of all runners on a team that was replicable, and just not focused on generational talent. I was very lucky. The first-generation USATF instructors were my instructors. Joe Vigil, Gary Winkler, Vern Gambetta, Gary Wilson, Dorothy Doolittle, and Rick McGuire, all taught me how to coach runners of varied ability so that all could be successful. My accomplishments as a second-generation instructor in the program pale in comparison to the giants that I learned from in USATF Coaching Education. I do think I have accomplished one important thing and that is to keep alive what it was all intended to be when it was developed 40 years ago. The basic structure and three levels of instruction are still there. It has withstood the test of time, partly because I was in the room and tried to maintain what the lions who developed the program intended it to be. I have seen many attempts to move away from the scientific perspective that the curriculum is based on. I am proud to report to Vern Gambetta and Joe Vigil when I occasionally still see them that the spirit of discovery lives on in USATF Coaching Education, and that it has not become a cookbook for contemporary coaches seeking quick answers.

MR: You've coached countless Minnesota State High School League (MSHSL) state champions, including alumni Ben Blankenship, a 2016 Rio Olympian (1500m), and in 2017 were inducted into the MSHSL Hall of Fame. While the standout teams and individuals may get more of the spotlight, you've had athletes of all abilities on your Stillwater teams. Tell us about your coaching philosophy for not only creating a winning program at Stillwater, but also how you've prepared your athletes to become successful individuals (in life) regardless of them continuing in the sport collegiately or even professionally, and its importance?

SC: If you watch me at a track meet, hopefully you will always see me rushing up to the athletes at the finish who just set personal bests, and not just hanging out with the winner. With 75 distance runners on our team, that is a lot of personal bests to memorize and keep track of. All runners want to hear sincere praise from their coach right after they accomplish something extraordinary, not some mention of it on the bus ride home or the next day. I get more pumped for a miler who breaks 5:10 for the first time than for the guy breaking 4:10 for the first time. I sincerely mean that. The 4:10 guy is going to have a back-slapping mob around him at the finish and I will soon have my moment, but the 5:10 guy is just as happy, and there is never a wait to talk to him. At Stillwater, it has always been important for younger runners to learn from older runners. I have very few rules for the boys, but lots of expectations. Rules can be put down on paper, expectations come from the heart. Over time the boys learn these expectations from me, and most embrace them, which leads to high levels of performance in everything they do. There is no doubt I have an ego, for you cannot stay competitive without it. Ego only becomes a problem when it reaches the point where you believe that you alone are responsible for your success. I promote healthy ego development along with physical development. This is a necessary step in developing not only good leaders but good followers. In the end, coaching philosophy is not what you write down in a sentence or two on a website or job application. It is how a coach lives their life, which then becomes how the team leaders live their lives, and finally how the followers live their lives. There is a lot of responsibility here. Coaching is certainly not a profession for everyone.

MR: The city of Stillwater, MN was named the "3rd best place for runners in 2021" according to a ranking compiled on Outside.com. One might think your cross country and track and field teams' long history of excellence at Stillwater High School had to provide a boost, or at least a consideration to that third-place

ranking and only two spots behind Tracktown USA, Eugene, OR. Despite the harsh winters, certainly sounds like a setting for a training oasis. As the outdoor season opens up, what's your outlook on the season?

SC: It was certainly fun seeing little Stillwater ranked right in there with Boulder and Eugene. I am proud of that publicity for two reasons, with one being the influence our successful team had on the ranking. The other piece that made me proud is that I have been a Stillwater Parks and Trails Commissioner since 2005. The investment we have made in great parks and trails has been astounding, not only in serving the entire running community but the town in general. This is an outdoors town quite frankly. Besides running we have biking, kayaking, skiing, rock climbing, and many other outside activities. Kids grow up doing these things. Get a summer job? Are you kidding, they would have no time for that. This lifestyle completely benefits the development of the runners on the team. They start as 9th graders with so much "accidental fitness" that it is astonishing. Runners arrive at summer practice with kayaks and mountain bikes racked on their cars (same as me), and once we are done running off they go for the rest of a great day. They like to work and sweat and be outside. The runner's mentality. Sure, we have cold winters, but it is not 1858 when Stillwater was the government center of the new state of Minnesota. With modern clothes and the desire to be recreating outside we run all year long. There might be 5-7 days where weather is really an issue but name any place that is better than that. Predictions are for meteorologists and election pundits, and I certainly do not have one for our team this spring, as any scientist will say, the best predictor of future events is the evidence of past events. Since 2000, we have been in the top five teams at our state meet (two divisions in Minnesota) 14 times, so somewhere in there would be a best guess.

MR: And lastly, what has been your favorite USATF course (or lecture topic) to instruct?

SC: I just love teaching. Picking a favorite course with that mentality is tough, but I am also a traditionalist. So, I will pick Level 2 as my favorite USATF course and I am excited to debut the updated Endurance curriculum at the summer 2022 school.

MR: Thank you Scott. I always appreciate your Minnesota candor and can't wait to catch up with you after the MSHSL state meet. For our readers, you can catch Scott instructing next at the July USATF Level 2 School and the upcoming Cross Country Specialist courses. We hope to see you there!

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