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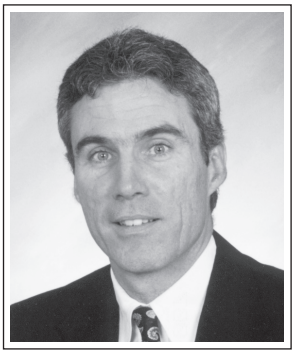
FROM THE EDITOR

RUSS EBBETS

THE INTERVIEW



I have always liked doing an interview. Granted, they were much work on the front end but if I got all the research done, sculpted the questions right and organized the material so that it elicited a theme for the piece, I was usually pleased with the result.

While some might counter that an interview is not really all that technical, I'd disagree. One of the problems with asking someone to write an article for Track Coach is that the whole process can be daunting. Time is always an issue. And many coaches, by nature, might not be "writers" as such and the idea of getting their thoughts down on a sheet of paper can be intimidating. Multiple thoughts can swirl in a coach's mind – where does one start? What is most important? How much detail is necessary? All that can create obstacles to creativity and paralyze thought.

Of course, there is the recorded interview, with comments made "off the cuff" but again some don't like to do that because they may say something they don't necessarily mean or on second thought might not really believe in. Some get talking and don't stop and what comes out may be too wide-ranging, lack focus and be almost meaningless to most people.

With a written interview I can break the whole process down into smaller parts (like Maslow's manageable wholes) and allow the coach to elucidate his or her thoughts in a paragraph or two and then move on to the next question. If I have done a good job structuring the questions properly one issue or idea should be addressed with each question. The coach gives his thoughts, and the process builds into a cohesive whole. This may allow the coach to express a comprehensive overview of his program, his philosophy or other thoughts and feelings, giving the reader an informative and educational "peek behind the curtain" of an individual who has achieved an exceptional level of success in his discipline.

When I first asked Charles "Chip" Button to do an interview he politely declined. It was November 2021 and Chip was in the middle of the high school cross country championship season. His boys' team was vying for the top program in New York State. It was bad timing on my part as there were no doubt dozens of thoughts swirling around his mind as he endeavored to achieve the ultimate level of promise his team appeared to have. I shelved the project.

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EDITORIAL COLUMN

Continued from page 7688

Resending my request in January 2022 Chip politely declined again. His answer was more detailed and thoughtful. He made several self-effacing comments that could be summarized with "there's nothing special here," as he politely declined a second time.

I felt Chip was wrong. His Burnt Hills-Ballston Lake High School program has long been a first-stop for East Coast college coaches looking to fill out their rosters with one of his latest stars. Year after year his program has produced well coached, well mannered boys and girls for whom running is a team concept and whose contribution to a new team could be made in many different ways.

My third request countered Chip's "reasons" one-by-one. I asked again if he'd do the interview and added if he declined, I'd ask a fourth or fifth time if need be.

Why the persistence? A state championship for any coach is a lifetime achievement. For many coaches this achievement solidifies a coach's career. In some 40 years of coaching, Chip's boys and girls teams have won 14 NYS Cross Country Championships. During that time Chip's teams have won some 34 regional sectional titles in the Class B (editor's note – NYS is broken down into four classes, large schools are A's and the smallest schools are D's, the state is further broken down into 14 regional sections). When his teams have not won the sectionals they were the team the eventual winner had to beat.

Chip has never spoken at a clinic. He told me it is not his "thing." But he has attended countless clinics, listening and learning, toying with ideas and tinkering with changes that have created a juggernaut program that yearly identifies, develops and manages talent throughout a high school career. And while what he does on a daily basis may be, to use his words, "nothing special" one would be hard pressed to find another program with his similar successes.

The secret to success is almost never "one thing" but rather many, many little, seemingly insignificant, things. Individually these "things" might not amount to much but taken in total produce the successful outcome. Ironically, even a coach may dismiss many of the "details" as not important, too mundane or insignificant. The interview has allowed me to highlight the details, thoughts, beliefs and actions that in total, create a grand mosaic of what a successful coach, program or career looks like from the outside looking in.

Well, this has been a bit anticlimactic since the Chip Button Interview arrived too late for inclusion in this issue. Watch for it in #142; it'll be worth the wait.

HIGH JUMP ROUNDTABLE PART II

COORDINATED BY RUSS EBBETS

This is Part II of a wide-ranging discussion of high jump technique, training and related issues.

The panel: PS—**Paul Souza** was the head coach at Wheaton College, 1995-2011. His women's team won eight national championships. A Level 1 and 2 USATF certified coach and has served as the national vertical jumps chair for men's development. He still holds Penn State's indoor HJ record at 7'4 ½".

RN—Retired high jumper **Rick Noji** finished 8th at the 1991 World Championships. His personal best in the high jump is 2.31m (7'7"), achieved in 1992.

DS—**Dwight Stones** needs no introduction to track fans. He is a three-time world record holder in the high jump and won two bronze medals at the Olympic Games. Since retirement, he has been a color commentator on television, and still coaches young athletes.

MC—**Marissa Chew** is currently an assistant coach at TCU; she has also coached at IUPUI and Wabash. She is a Level 3 certified coach in the jumps.

DK—**Dave Kerin** coached at Middlebury College for 14 years. He still serves as the chair of the women's high jump, coaching education level 1 and 2 committee. He is a Level 3 coach and a USATF master official.

What are some talent identification tests you use—vertical jump, standing long jump, others?

MC — Standing LJ, 5/10 bound test, overhead back toss (medball)

PS — As far as identification tests, vertical jump and standing long jump are NOT always good indicators of high jumping. High jump is about force application. Applying a force to the ground with one foot to lift your center of mass. I think a standing triple jump is a better indicator of the high jump because the athlete is applying force to move the center of mass. In a standing long jump or vertical jump there is no application of force. I'd also line the athletes up and ask them, with a few steps and a one foot takeoff, to try to touch the net or rim on a basketball hoop.

DS — When I get a new jumper, I have him/her show me what they've been doing with their approach and their technique execution. Then I jump them from 4-steps and start evaluation where their approaches should be based on their height, their speed, their plant target, etc. Then I have them run full-turn 100m at approach speed and count their foot contacts so they learn to find their correct stride length. I really don't use other tests to evaluate their abilities. If they're high jumpers only, and I think there are other events they should consider, e.g., LJ, TJ, 300m hurdles, 400m, etc., I

encourage them to try them. I also encourage them to get with the TJ coach to learn how to bound and with the hurdles coach to learn how to utilize their arms better.

Bar clearance — are there any special exercises or stretches you use to create and maintain spinal mobility with things like back arches or stretches on a large physio ball?

RN — Back stretches, hip flexibility and rotation, neck stretches and strengthening.

MC — I specifically use both of those exercises and vary the controllables on each. Back arches can be done by walking the hands down the wall vs. just elevating the body to inversion. Physio ball reach backs can be aided by a partner or have to be independently for stability.

DS — I have the jumpers do standing back jumps so they can activate the important muscles for better controlling their layouts. Bridging is key as well and the physio ball is a great tool.

PS — I like jumpers to do back arches on a physio ball or on their own from the ground. I also have a back arch drill where I or another athlete lie on our backs and hold the jumper in an arched position with our hands on their shoulders and our feet under the back of their knees. Also active stretches like Scorpions which put the hips and spine through a full range of motion are advisable.

DK — They are mostly "HJ Theatre" and add ramp jumping. Ramp use is anecdotal coaching, not grounded in scientific realities. Bar clearance issues rarely stem from lack of mobility. They trace back to the nature of runup and jump. What I see these days, I describe as "Long Jump with a Cirque du Solei finish". When watching video, look for orientation of hip and shoulder axes entering third step from plant requiring a hard pivot in spikes that don't want to pivot, resultant loss of lean, then a straight run at the plant.

In the pre-season—how much and what type of work is done before the first jump day? What does the first jump day consist of? How many jumps, how high?

DK — The focus is on getting the tendons, joints, muscles ready for the jumps and impact of jumping. So we start with low amplitude, low altitude jumping and movements. We graduate that to repetitive jumps/skips to lead into the running and jumping. The first day will consist of short approach jumps with a box or ramp.

RN — Foundation work – heavy lifting. As jump day gets closer weight workouts become lighter. Sprint workouts always carried through jump days, but somewhat modified from what the sprinters would do. What does the first jump day consist of? A lot of approaches, the short approach jump work. Concentrating on my lead knee and being quick over my takeoff foot. Good body position; not leaning in on takeoff. Box jumping or springboard. How many jumps? If early in the season I did not have a count. It was more based on if my body started to break down. How high? Started low – 6'2", progressed to 6'8" or 6'10". I don't recall going above 7'.

DS — I addressed this a bit earlier. I jump my kids about 70% from a 4-step approach, not more than that the first couple of weeks of jump training. As we get closer to competition, we transition to more and more full approach jumping in practice in groups of three so I can gauge when they're running out of gas.

What is the intercept point and how do you calculate it?

DK — Draw a standing rectangle. Place a dot in bottom right corner. Add dot in top left corner. Bottom dot reflects intercept (curve start) top dot reflects left-foot plant location. Draw a curve connecting the dots. Now widen the rectangle away to the right, short of forming a square. Add new bottom right dot. Draw new curve connecting top left to new-wider bottom right. Any added width away from the original intercept enables tighter curvature. And all curves require 5 steps to get from 90 degrees to bar, down to attack angle effectively.

DS — Ah, there's the rub! Since I invented the "J" approach, which I wished I had never called it, I've been re-training jumpers how to run the approach correctly. An 8-step "J" approach is not 4 & 4 as so many coaches believe it to be. For me, it's 2, 2, and 4. Two steps in a straight line to a mark determined to the side of the standard (for me that was 4.40m). The next two foot contacts are "transition steps", designed to set up the turn proper. The last four steps are in the curve to the takeoff target. Those "transition steps" are what few coaches know how to coach and jumpers have a tough time learning. I stand/sit directly behind the jumper so they run away from me on their approach. I watch to see that they go in a true straight

line to their mark. After that second foot contact, I look to see that their bodies begin to "fall" toward the center of the "circle". That "falling" is not to be done from the hip to the shoulder but from the ankle to the shoulder. It's a full commitment of the body to properly prepare to run the serious part of the curve. The third foot contact will be in that initial straight line but the fourth foot contact will be slightly inside that line and the body will be fully committed to the curve. It's easiest to see all that from behind the jumper. By the way, I have found over the years that most girl jumpers are between 9 ½ & 10 ½ feet out from the standard and guys are from 10 ½ & 12 feet out. This all depends on where their plant target is, their physical height, and how high they're jumping, of course.

RN — For me it was my fifth step. I honestly don't remember my measurements. To calculate I ran a reverse approach several times. Coach placed a tape mark on my fifth step. I then selected the mark that felt most comfortable and put me in the best takeoff position. During meets I would mark my fifth step as a gauge of accuracy and rhythm in my approach. I think most of my career I was around 14' out, 60'-70' back.

How do you teach the drive leg? Do you teach shrugging the shoulders?

RN — Plyometric drills, bounding, box jumping, tension bands, sprint workouts, and in the weight room I used standing hip machine; drive the lead leg and finish on my toes. Do I teach shrugging the shoulders? No.

DS — I focus on the four things the drive side leg/knee do. 1) distance traveled (long levers/physical height are a huge advantage here), 2) speed that distance is traveled, 3) how high that knee is driven (stress getting it beyond parallel with the ground), 4) how long you can keep it there! That's why we jump a lot from short approaches as that isolates the technique with less of a speed component. I've lately been focusing on two and three step approaches in order to better teach the relationship between the execution of the "sweep & pull" with the arms and the quickness of the penultimate step to plant steps.

WE JUMP A LOT FROM SHORT APPROACHES AS THAT ISOLATES THE TECHNIQUE WITH LESS OF A SPEED COMPONENT

MC — I teach that the drive leg needs to be pushed into position and has to be blocked (mostly at parallel). I don't cue the shoulders unless the athlete is doing it innately.

DK — Drive the free leg knee vertically. Plant applies force to the ground while "blocking" the body's plant side, accelerating the drive leg side. This creates rotation of the body about its vertical axis, establishing back to bar position. Plant foot placed parallel to the bar creates undesirable torque and obstructs rotation. This finds jumpers pre-turning their shoulder axis before plant in a misguided attempt to fill the demand for back-to-bar rotation.

PS — In terms of the "drive leg" in the high jump, I try to avoid using the word "drive." I prefer the term "swing leg" because the leg swings through from the hip. That way the hips are guaranteed to move. The idea of the high jump is to displace or move the hips up toward the height of the bar. Swinging the leg through from the hip will help achieve this.

How long do you rest between a track workout and lifting weights on the same day? Do you do any special nutrition during that break time?

MC — If weights and track workouts are on the same day I don't mind if the lifting is post-workout. If it has to be before the track session, I try to have as much time between the two as possible (e.g., 8am lift, 2pm track). Depending on the timing, if the weight room session is post track our nutrition station has quick energy items like fruit snacks or juices that the athletes can consume.

RN — About an hour. Do you do any special nutrition during that break time? No, my diet was lousy.

DS — I don't mix lifting and sprint/interval training on the same day as I don't want to injure my young jumpers. I have more digits than there were times that I did those activities on the same day.

What do you use for alternate fitness in pre-season or between seasons? Basketball, volleyball, something else?

PS — I tend to avoid activities where the legs are heavily involved in between seasons or in the off season. The idea is to allow the jumpers legs to recover from the work of the regular season so that they can begin the year rested,

strong and ready for a good year of training. I prefer swimming and bike riding or any non-weight bearing exercise instead of volleyball or basketball.

DS — If my jumpers are already participating in those sports, I encourage them to keep doing those things that are carryover to high jump. I'm always concerned about my jumpers getting injured doing those other activities but there's nothing I can do about it. Trying to take it away from them just creates animosity.

MC — I have used the pool in the past, in addition to sand volleyball, jump ropes, yoga. I am apprehensive about basketball due to the rate of rolled-ankles.

RN — basketball, golf, racketball, swimming/pool workouts

How do you peak a high jumper? Are there workouts over the last month that you shoot for? How much rest is involved? Any special weight training?

DS — I addressed this earlier. I have a periodized training program (ICP) that accomplishes this. It's very similar to the program I used for most of my career and it has worked beautifully at all levels of jumpers I've coached over the past 28 yrs.

RN — Everything was light and quick and rhythmic. No heavy lifting or bounding. Intensity/quality counted over quantity. Before a big meet I used to take two to three days off; only stretching, resistant bands – light and fast, and approach runs, and a few pop-ups. Any special weight training? Only light, fast resistant bands.

Do you do box drills? What type, number of contacts and how high are the boxes? Are they routinely the same workout or is there much variation from one workout to the next?

DK — Only from a standing, back-to-bar start, and not very often. I encourage people to stay away from ramp jumping. The nature of the runup to a box/ramp differs greatly from the same in competition jumping. You can't run to a plant on a box or ramp like you do in a competition jump and joint stability is compromised. Torque prior to, and misalignment at plant are an injury tag team often working against the tibia. Ramp jumping primarily assaults the ankle and bones of that foot.

DS — I make my jumpers aware of box drills as part of their plyometrics training but I don't have that equipment available to me. I mostly work with my jumpers on actual jumping and approach work and sprint/interval training.

RN — Yes, I loved box drills, especially used during high jump drills and 2, 3, 5-step approaches. Started low at 6'4", then progressed higher as number of steps increased. The highest the bar was set at is 8'. What type, number of contacts and how high are the boxes? Total number of contacts ranged from 3-8. Worked on lead knee, foot placement, body position, arm action and foot quickness. Box height was 12", maybe 18". Rarely used a box spring. Are they routinely the same workout or is there much variation from one workout to the next? Basically the same.

How much actual running do you do? How do you quantify it – miles, minutes or meters? Is it predominantly jogging, interval work (what type?) or running technique form work?

MC — We do a limited amount of running for the HJers. Dependent if they have any other events specifically but at minimum they will do sprints from 30-150m with focus varying from acceleration, rhythm, technique. In the warm-up, they will jog 800m consecutively followed by drills (sprint and jump oriented) for up to 30m.

DK — Again, you can hold your breath and high jump. So, what contributions to the jumper from running are you looking for?

PS — In terms of running workouts, I train high jumpers similarly to short sprinters. Short runs of 10m, 20m 30m, 40m up to 60m. I also do one day a week of longer sprints like 6x 200m at 75% w/2 mins. recovery.

DS — I was a sprint/interval trainer and I advocate that for my jumpers. The amount of meters on the long sprint/interval day is usually between 1000m-1200m and the short sprint/interval day is 750m-900m. Early season is more focused on restricting the rest and running a bit slower in order to achieve that. Example: my first sprint/interval workout of the season was on the first Tuesday in October. It was 4 x 300m with 3 mins. rest in 45 secs. I would reduce the time by .5/week until I reached 42 secs. (6 weeks) and then I increased the rest to 5 mins. and kept reducing the rest by .5/week until I got to 39 secs. By then (12 weeks) it was competition season. I ran everything with spikes on as I felt I needed everything to be on the balls of my feet.

RN — Off season – I did mileage – 1-2 mile warmup. 3-4 miles as a workout, then lifted. During season I didn't go more than a mile. Sprint workouts during season. How do you quantify it? – miles. It is predominantly jogging.

Do you ever jog with a weighted vest or barbell? What about weighted clothing or the old red brick in the backpack?

DS — I don't believe in weighted training. In my honest opinion, it screws up the timing of everything. I know people have had success with it and God Bless Them!

RN — Weighted vest only preseason, and not that often. Usually when Coach Shannon wanted to baseline the weight people.

MC — Jogging, no. Drills, yes.

DK — Vashti [Cunningham] has had success training in weighted clothing. Despite some who have argued differently, they've done a remarkable job managing training and competition to keep her healthy. That's no small feat given the forces she generates while intentionally carrying minimal mass. There is a difficult balance to strike between sufficient strength to support joints under load while not carrying any unnecessary body weight.

What type of eccentric training do you do? At what point in the season does this work end? What are the benefits, as you see them, of this type work?

DK — I have been a proponent of drop landings since my research on eccentrics 20 years ago. I also like isometric holds in key positions of the run and plant. Static posture holds are also an opportunity to address visual targeting. And iso holds teach the jumper to associate the degree of foot friction sensed with a corresponding degree of inward lean.

DS — I have my jumpers stop all plyometrics, except skipping pop-ups, three weeks prior to the meet where they want their season "peak." We shift our squat lifting to "equal jumping depth" and focus on the concentric component and speed.

RN — Squats, box jumping, elastic bands, weightlifting – cleans. At what point in the season does this work end? Squats and cleans – all year round. Weights go from heavy to light during season. For me the benefit early season was that it set a good foundation that I carried throughout the season. Lighter quicker weights keep my muscle synapses firing.

How do you feel about the Jumps Decathlon? Have you ever used anything like this before? Any pros or cons? What point in the season would you recommend this done? If you used this was it an annual event (i.e. – conclusion to a Fall preparatory phase) or more a spur of the moment idea?

RN — I like the jumps decathlon. When coaching, it's fun for the kids; instant feedback and gets the competitive juices going. In college it was fun because you see so many different types of athletes. You have a chance to see everyone's athletic ability. It's a different level than high school. I remember at the University of Washington seeing a 225 lbs thrower jumping 10+' in the standing long jump! So explosive. I don't remember my stats in the jumps decathlon… Yes, good baseline during early training, followed up just before competition phase of training… Early season…In high school it was a spring event. Coach Bundy only used to baseline performance. In college it was a fall event. Everyone under Coach Shannon had to participate. It was amazing to see the athletic ability of the throwers; male, female and they. You could see the explosive ability in each athlete. It also brought out the competitiveness in each one of us. It also created camaraderie. It was fun to participate and watch.

DS — Sounds like a great idea and a lot of fun for the kids. I've only had a couple jumpers who did all three jumping events and I wasn't a fan. He was a better high jumper than anything else so I allowed him to take a maximum of 2 LJs and 2 TJs/week, meaning, if he scratched on the first LJ or TJ at the dual meet, he could take a 2nd jump to establish a legal mark. That's all! Only runway work during the week.

COMPETITION

Are there any events you see as complementary to the high jump? I'm thinking of a Junior Olympic athlete here. At what age does specialization in the high jump become the pre-eminent goal?

DS — 400m and 300m/400m hurdles. TJ for those old enough to learn the technique. I detest LJ/HJ combo though I encounter it a lot. LJ and HJ share only three things; i.e., the word "Jump", the rhythm of the last four steps, and the fact that you're in the air for approximately one second. Outside of those elements, long jump is terrible for a high jumper! I believe kids should

try anything they think they'd like or be good at through their sophomore year in high school. By then, they should have figured it out and they need to focus on what they can actually improve at and achieve their potential.

MC — I have found that the HJ and LJ correspond to each other and that is typically the complementary event for an athlete who tends to HJ. I would say that for a collegian, that is when it becomes prominently specialized. It is getting younger and younger that the athletes are specializing in the vertical jumps but that is happening as a society, the specificity of movement at an earlier age.

RN — Closest I can think of is the long jump and sprints. …It depends on the athlete and the program (high school, college, club) and the success they are having in the high jump. I knew sophomore summer of high school that high jump would be my primary event, with the sprints, long jump being secondary.

Early on, Coach Shannon made it clear he wanted me to specialize in the high jump. I think if I had the physical strength going into college, I could have added the long jump. Most likely as the athlete progresses in his career, the more likely he will specialize.

What role does consistency play? I'm asking about a mental approach to training and competition but also performance, as in developing the ability to produce a consistent height despite less than ideal conditions.

MC — Consistency plays a huge role. There is comfort to be had when a movement has been accomplished in repetition with success.

HIGH JUMPERS ARE CREATURES OF HABIT. THE MORE CONSISTENT THE ROUTINE YOU DEVELOP FOR THEM, THE LESS LIKELY THEY ARE TO HAVE INCONSISTENT PERFORMANCES.

PS — To me, consistency is the key to the high jump. There are so many variables that can affect the outcome of each jump, therefore, the more consistent a jumper is, the less is given to chance. High jumpers are creatures of habit. The more consistent the routine you develop for them, the less likely they are to have inconsistent performances.

DS — Training for athletics is no different from studying for an exam. If you read the chapter, answer the questions at the end of the chapter, review your notes, etc., you should be confident that you'll do well on the exam. Once you develop a system for training/studying and you execute systematically, you have to believe you've done all you can to ensure a successful performance. I know that sounds terribly simplistic but, though I was a terrible student because I did none on the preparatory work, I was a rote, consistent, possessed athlete in training because I knew I had limited physical talents and I had to do everything to develop those talents if I was going to have any chance of competing against those who were much more physically gifted, and in systems where training was their job. I was a Master Technician, an obsessed maniac in practice, but only a B+ athlete.

RN — Consistency plays a big part. During big meets you always wanted to perform at a high level. Consistency transcends into many facets of one's career on and off the field, such as reputation, sponsorships, meet invitations, competitors. My usual routine before a meet was to visualize the things I worked on in practice for the week, visualize my approach, cadence of the run-up, clearing the bar. There are so many factors to prepare for; track surface (I had two-three pairs of shoes with different spikes sizes and types), time of competition, weather, number of jumpers, long or short competition, number of jumps, height progression, etc.

What is the number of jumps you prepare for in competition? How many competition jumps are necessary before an athlete "feels good?" Or do you teach that the warm-up should produce someone 100% ready to go?

DS — I've always believed that jumps 5-7 are your best efforts. You've established a comfort level with the facility, the prevailing weather conditions, etc., and you've had a few warm-ups and several serious, competitive efforts where you only need to make small adjustments if any. That fact should inform your starting height and you must be honest with yourself about misses you might have en route so you can maximize that window. Because of the amount of background training I did to endure 50 competitive events/season, I was confident of good efforts up to and including jumps 9-12. I actually set my first WR (2.30m — Munich — July 1973) on my 18th jump of

the night as I routinely took many, competitive straddle jumps in competition in those days, so I started at 1.90m that night.

RN — I prepared for as little as 4 to as many as 10-12 …warm-up should get you ready, but mentally the first jump was nice to clear!

PS — A high jumper has 7 to 8 optimal jumps in him per competition. This should help determine starting heights, etc…Thus, I prefer full approach warm-up runs and short approach jumps in competition warm-ups, rather than full approach jumps. Save the great jumps for the competition!

MC — In comp, it is ideal to jump approximately 7-10 attempts for us. I would like the athlete to be ready to go when competition starts. If they are the type that needs a comp jump to "feel good" that is built into the count.

DK — If you do a quick dive into meet results, you will find that the highest makes in competition occur in a range, say 5-7th jump for a high schooler and jumps 6-9 for an elite. So opening height selection and first jump makes should attempt to get the athlete to the goal bar height targeting those ranges ideally.

How do you recommend one manage time at large competitions that may take several hours to conclude? Any tricks to maintain one's mental focus, energy levels and general jump preparedness?

DS — I tell my jumpers to conserve their energy by just sitting still and reading/studying rather than constantly moving/stretching during a meet which manages some nervous energy but also dissipates stretch-reflex and general energy over time. I did it differently because I wanted my competitors to wonder what I was doing. I would go over to other events and coach some of my teammates, I'd give splits to our middle distance runners, and generally enjoy the other events going on around me, always being aware of when I would be "in the hole" so I had the time to mentally prepare for my performance. That was the method I chose to get into my opponents' heads. I would recommend it as a general practice!

IT IS IMPORTANT FOR JUMPERS TO STAY MENTALLY ENGAGED IN THE COMPETITION.

DK — A cheetah sits in the shade, bolts out for 'dinner', walks back to the shade… Athletes need mindfulness, purposeful short distraction, timely re-arousals, micro re-warmups, pre-attempt potentiation, and importantly, a shared coach/athlete comprehension of the mission prior to the competition.

PS — As far as managing time at a competition, I think it is important for jumpers to stay mentally engaged in the competition. This includes knowing where you are in the order and where you are place-wise in the competition. Also, I am not a big fan of athletes listening to music between jumps. Music can raise an athlete's arousal level at a time when they should be resting. The best time to listen to music is right before your name is called so you can carry that arousal into the next jump. Also, the jumper should have a short warm-up routine before the next jump that includes some kind of active stretch and an explosive movement (i.e. in-place jump) to activate the nervous system.

RN — Stay warm, keep sweats on, develop a routine, listen to music, talk to competitors, stretch, jump rope, watch rotation, short sprints. Training – aerobic

What are some competition strategies you promote? First makes? Number of jumps?

MC — I always encourage first attempt makes. There is a confidence that is taken from that.

RN — Plan out jump progressions – opening height. Know where you're jumping; place/stadium, know the surface, time your jumping, expected weather, travel schedule, etc. When in competition concentrate on what you as a jumper need to accomplish. It's just you and the bar. Don't concentrate on how well other jumpers are doing. However, be mindful of how many competitors are left in the field — know their misses and makes – when field narrows — you may need to skip heights to your advantage. Number of jumps? 4 to 10 jumps; 3 to 4 heights; 7'2" – 7'8".

DS — I try to impress on my kids that they MUST be first jump clearance jumpers. Muttaz Barshim and Gianmarco Tamberi helped me drive this point home this season with their spectacular, historic high jump competition at the Tokyo Olympics. I didn't always follow my own advice, but I was supremely confident in my training, my technical expertise, and my will to win so that I was mentally prepared for high level, third-attempt clearances. That takes time to develop so I'm

relentless with my kids about being in the moment on the first attempt.

DK — First jump makes are mission specific, not strategy. Coaching that is grounded in facts, accurately discusses the supporting sciences, logistics, etc… in a way that bridges to practical application. Start with the facts then form opinions, not the reverse. Many HJ educational resources present opinions as facts.

What are three common mistakes you see jumpers make and how would you correct them?

DS — 1) Stopping using the arms on the approach. Using the arms, for the most part, are a "conscious" cue that you must constantly reinforce. The moment a "conscious" thought comes into the mind of the jumper on the way to the bar, the arms will stop working, which changes everything. 2) Getting off the penultimate step too slowly for the height being attempted. 3) Getting too deep in the straight part of the approach which facilitates a late, sharp turn and a jump that goes down the crossbar instead of to the back corner. 4) Bonus common mistake, using too much speed!

MC — 1. Rushing the approach and not allowing the approach to set up the jump (be patient and trust your timing) 2. Jumping into the crossbar (keep your body up and away from the bar to allow for you to rotate over) 3. Rushing out of flight (finish the jump, hold your positions to complete flight)

DK — Any three are likely from less < 5 step curves. Use Lane 1 on indoor 200m track. 5 steps to the finish line then 5 curve strides. Tighten only after seeing early acceleration, initiation of a solid curve run honoring key positions and posture to plant. Note: A semi-circle run is revolution about a fixed point, not each step seeing rotation about the long axis of the body. And, spikes don't pivot so after limited ROM at the ankle they are cranking on the femoral notch, extremely…

VICTOR SAILER

Current world record holder Javier Sotomayor (Cuba)

RN — Not running a curve, stepping out on their second or last step, leaning into the bar.

PS — Three common mistakes I see jumpers make all the time are: Starting too fast, cutting the turn to the bar and diving across the bar toward the pit.

Starting too fast. Using the verbal cue "Push, Push, Push" will cause the jumper to focus on pushing out at the beginning of the approach which should in turn slow them down.

Cutting the turn to the bar. Using the verbal cue "Inside Out" will cause the jumper to keep the inside foot to the outside shoulder which will, in turn, keep them properly in the turn.

CLAUS ANDERSEN

Patrick Sjöberg (Swe)

Diving across the bar. Emphasizing proper arm and leg swing should help the jumper the "hit the vertical" and keep him going straight up rather than across the bar.

For a youngster – how do you decide which leg him/she should jump from?

PS — Determining the takeoff leg can be tricky. One would think that whichever hand you write with, your opposite leg will be your strong or takeoff leg. That, however, is not always the case. You can try sneaking up behind your jumper and shoving them in the back to see which foot they put forward to support themselves from falling. In these days of lawsuits, however, that is not advisable. I still prefer having them take several one footed takeoff jumps at a target to see which foot they takeoff with naturally.

MC — I have the new jumper try to jump and reach something high (e.g., a basketball rim) with the directive that they must take off on one leg. I will take note of which foot they jump off of.

DS — If they long jump or hurdle, that's pretty easy. If they do no track & field event that would determine that, I have them stand still with their arms at their sides and look straight ahead. I stand behind them and shove them lightly between their shoulder blades and see what leg goes forward. 99 times out of 100, that's their takeoff foot.

RN — I use the basketball layup technique to determine what is the dominate leg.

How much does the take-off point move as the bar gets higher?

DS — I tell my kids that the plant target doesn't change until the crossbar is over their heads. Once that happens they'll need to determine how much extra distance they need in order to have enough room to elevate so they don't hit the bar on the way up. I had a formula that served me pretty well but it's something that's very individual and is learned over time.

PS — I always used the 6-inch rule. 6 inches back for every 6 inches up.

RN — For me my takeoff point did not move much as the bar got higher. Slight adjustments may have been required depending on weather, track and surface conditions.

What is the correct head position over the bar? What should the eyes "see?"

MC — The chin should be elevated or off the chest while going over the bar. I ask the athlete to find a point of contact for the eyes behind the pads (a scoreboard, tree).

RN — For me, back and to the right side.

DS — If it can be learned/taught, the head straight back, a la Eddy Annys (BEL), Patrik Sjoberg (SWE), Ivan Ukhov (RUS), etc. is ideal for maximum "arch/layout". Barshim is also great at this. I could never learn it because I had a very small foam rubber pit that I learned on in high school so I developed a head position that permitted me to be certain, midair, that the pit was underneath me when I was going to land. I missed most of the pit enough times that that technique stuck with me for my entire career. I did not have a great layout and that probably cost me 2-3 cm., ultimately.

HEALTH

How do you handle body weight management? This can be a touchy, even dangerous subject. Who is involved in this discus-

sion past the athlete and coach (i.e. nutritionist, team physician, etc.)

RN — On a coaching level I have not had to deal with this issue. For me keeping weight on was always an issue. I struggled with food allergies as well. Diet was difficult. I basically stayed with foods that I know I could tolerate. Hard thing is when you start to travel all over the world. I guess, thank goodness for McDonald's and pizza!

MC — Body weight management is a conversation related to strength to weight ratio and the demands of the event. We discuss what is ideal for success in that event group and include the nutritionist to help achieve the proper nutrition to achieve that. We would include the team physician if there is a concern of health issues.

DS — A long time ago, I developed a good workaround for this discussion with my mostly female jumpers. "Power to Weight Ratio!" I'm not interested in getting into a sketchy area about weight with my jumpers. I teach physics and geometry when I'm coaching high jump. My jumpers know Newton's Laws of Motion and I tell them, you have a choice, you can get taller and improve your power to weight ratio or you can modify your eating habits. I usually make sure the parents are present when I'm having this conversation. I've never had any blowback using this approach.

Patellar tendinitis in the takeoff leg is an occupational hazard for high jumpers. Do you have any strategies for preventing, lessening or treating this condition?

DS — I deal with shin splints 100 times more than any patella issue. These rubberized tracks have increased this problem tenfold over the past 20 years. By monitoring running form and plyometric execution from time to time, I can spot these problems before they surface so it hasn't been a problem for me.

RN — Good overall conditioning especially exercises that help strengthen around the patella. A good cool-down regimen, along with icing.

Do you have any recommendations for returning an athlete to competitive form who is "all jumped out?"What do you see as the causes of being "all jumped out" in the first place? (note – obviously there is jumping but I'm thinking along the lines of schedule, too much weights, personal life, travel, etc.)

DS — Unlike myself, I stress to my jumpers that track and other activities are "extra curricular" and their academics have to come first. So yes, I impress upon them that they should do as I say, not as I did and I'm very honest with them about how risky my simple plan was. Unfortunately, I've only had a couple athletes in my coaching career who displayed the kind of dedication to the event and their training for the event that came close to how dedicated I was. It's hard to get that through the heads of 14-18 yr. olds these days.

RN — An athlete must know their limits mentally and physically. Constant communication with all coaches and trainers involved are key. An athlete's training should be balanced, not too much weightlifting, jumping, or running, etc. Travel is difficult, and I understand that there are sponsorship commitments, financial needs, but the team that supports the athlete must help an athlete manage his schedule. Mental health is so important to an athlete. Talking to a sports psychologist is highly recommended.

For your female jumpers – how much of a concern is the Q-angle (the angle formed from the widest point of the pelvis and the vertical line from the tibial tubercle)? Is it ever measured in your program? What is done with the information?

DK — It is of great concern while also being unalterable. A coach described a rival's women jumpers as having knees wrapped better than he wraps gifts at the holidays. HS athletes, parents and coaches, go online to perspective college team's websites. Something as simple as photos showing this, or multiple stories of injured athletes of either gender, likely represents 2D coaching of an event with 3D demands. Also, Google Valgus…

DS — This is far too technical and "inside baseball" for my level of high jumper. I take a look at the parents and that usually informs me as to what I can expect. We've all experienced the phenomenon of the freshman girl who's a potential world beater only to see them perform far below that level by the time they're seniors. Enough said!

SUMMARY

What do you see as the significance that the longest held records in both men and women's track and field are in the high jump?

DS — You can't ignore the PED component. Would Javier Soto-

mayor still be the world record holder without the drugs? Probably, but not at that height and not for this amount of time. Same can be said about Stefka Kostadinova. In my opinion, Muttaz Barshim set the WR in Brussels in 2014 when he cleared 2.43m. That was 25 years after Sotomayor cleared that height in Salamanca, Spain for his first WR. Several women (Blanca Vlasic, Heike Henkel, Brigetta Barrett) have been capable of eclipsing Kostadinova's WR (2.09m) since she set it in Rome, at the 2nd World Championships in 1987 but it hasn't happened and I see no one on the horizon who is capable. There's nothing that can be done about it. It has hurt the popularity of the event, without question.

DK — Find a clip of Stefka [Kostadinova]. You see technical efficiency and mastery present day jumpers fail to emulate. Freeze the clip at plant and see her left side joints in alignment, shoulder through ankle. Then watch her rise out of the two leans (inward and backward) on to the plant takeoff. Then, what seems like an eternity of vertical flight until rotations resulting from work prior to plant kick in. With the talent pool this country has, we should never lack for medal contenders and threats to break records.

Any resources and these could be videos or books you would recommend for further study?

DS — Anyone who has put their time and effort into trying to produce books, videos, films, etc. about technical events must be doing it as a labor of love. There's no way you can make back the time, effort, and money you spent doing it. I've been in the media for 45 years so I know what I would do if I was ever stupid enough to try and produce a video. I haven't gotten involved in this area because the amount of bad information I would discover would drive me nuts.

MC — I've used all of Boo Schexnayder's material as a base of knowledge to set up training.

DK — *Sports Biomechanics / The Basics,* 3rd Edition, by Anthony J. Blazevich. www.bloomsbury.com

Athletic Ability and the Anatomy of Motion, 3rd Edition, by Rolf Wirhed Mosby Elsevier. *Stability, Sport, and Performance Movement* by Joanne Elphinston, Lotus Publishing. *Track and Field Omnibook,* First 2 Editions, by Ken Doherty. Tafnews Press.

Video clips: Stefka Kostadinova, Mutaz Barshim (his non-injured years)

'96 Atlanta Games — Men's & Women's HJ Final Interviews/ Articles: Ed Jacoby, Dan Pfaff, Bob Myers, Centripetal Force, Fibonacci Sequence, High Jump articles found in pre-2000 T&F periodicals…

Research by: Dr Jesus Dapena, Dr James Becker, Dr Rodger Kram, Dr Sarah Churchill ALTIS Coaching Education Program: The High Jump

Anything else you'd like to add?

DK — An optimized jump lands mid-pit at near mid-depth. It has residual bar rotation such that they end up kneeling on the pit looking back at the bar. The nature of arrival at plant and execution of takeoff is tied to this. Pull up a clip of Fosbury at the '68 Olympic Games. See how effortless his gold medal 2.24 jump looks. Then consider Coach Berny Wagner said Dick was not one of the better athletes on his Oregon State team. Write davekerin@gmail.com for greater detail on any responses or for any questions.

DS — Nope, I think I've covered it as well as I can in this format.

RN — After competition I used to analyze my performance. At times I used to dwell on the negative. Questioning what I could have done better. Sometimes for days. One great piece of advice someone gave me years ago was to analyze your performance, ask what I could have done to improve, what were your successes, write it down, learn from it (practice it), and then move on/forward, put it in the past. This advice took me from a negative to a positive mindset. I still use this advice today in business. Also: Have a vision 1-3-5-10-20 years ahead.

How can you leverage your track career into your next career? No matter how successful you are in track, you will want to seek out new challenges. The discipline, dedication, and critical thinking that you learned during your athletic days will transfer to your next career.

Take advantage of free travel. Take time to get to know the country and place where you are competing, even if you are there just for a day.

For those athletes towards their end of their career – transition is not easy. The lifestyle change can be emotionally challenging. Just remember you are not alone. Keep in touch with your current and former competitors, teammates, and seek professional help.

RUNNING PERIODIZATION PART 1: LINEAR PERIODIZATION

BY JASON R. KARP, PHD, MBA

Adapted from the book *Running Periodization: Training Theories to Run Faster*

"You can't understand the value of a whole process by separating the parts from the process, or the process from the parts."

In the modern era, most of our understanding of periodization comes from the scientists, training theorists, and coaches of the former Soviet Union, with many of the original modern texts on periodization published in Russian. The scientific rationale for periodization is rooted in Dr. Hans Selye's General Adaptation Syndrome of 1950, and is based on the premise that athletes need to receive an optimal training stimulus that is balanced with appropriate recovery to cause adaptation and favorable long-term training effects. Periodization is thus a blueprint of predetermined sequential periods of focused training that guides the coach and runner in the acquisition of specific characteristics of fitness. It is not a static blueprint, but rather a dynamic one that the coach and runner use to formulate an optimal training program.

While variation is an important factor, periodization is more than simple variation of training stimuli; it's about *how* and *when* training stimuli are varied and *how* and *when* the volume and intensity of training are manipulated throughout the year, always considering the runner's progress and modifying the training accordingly.

PERIODIZATION ASSUMPTIONS

Although periodization is a valuable blueprint to build athletes' training, the theoretical and historical frameworks of periodization are not always in line with biological truths, and we are therefore left with several assumptions.

For starters, periodization assumes that there are established time frames for the development and retention of specific fitness adaptations and that biological adaptation to a given training plan follows a predictable course. However, as any coach who has been coaching for a while knows, not every runner adapts or progresses at the same rate or to the same extent. Indeed, individual runners often respond differently from one another, even with identical workouts and training

programs. Research has also shown a lot of variability in the response to both cardiovascular and strength training.''

That leads us to the second assumption, that training plans, training phase duration, and rates of progression can be generalized among the population, or that the training of elite runners, who are, by definition, extreme outliers, can be generalized and extrapolated to other elite runners or to less talented runners. Although the training of elite runners is often celebrated and admired, we actually don't learn much from studying how elite athletes train, because their results are more a product of their extreme talent (both their latent talent and their talented responsiveness to training) than of their specific training.

A third assumption of periodization is that various fitness attributes are best developed in a sequential way (e.g., strength before power or endurance before speed). And fourth is the assumption that training can be adequately forecast, that we can predict what's going to happen later so that we can plan for it now.

One of the reasons these assumptions exist is that periodization is a difficult thing to study scientifically, mostly because it's difficult to use the scientific method to test whether or not one method of training is better than another method of training. Scientists like to (and need to) control (independent) variables to isolate the (dependent) variable that they're trying to study. Variables that get in the way are called confounding variables for a reason—they confound the results.

If two people (or 20 people in each of two groups) train differently—person A (or group A) trains in a periodized way and person B (or group B) trains in a nonperiodized way, or they train in *different* periodized ways—and, six months later, person A (or group A) runs one mile or 5K faster than person B (or group B), can we say that the better race performance was *because* of the periodized training? Can we conclude that periodized training is better than nonperiodized training? What if we tried a repeated measures study design, in which a periodized training plan and a nonperiodized training plan (or two different kinds of periodized plans) are both given to one group of 20 runners in random order, with ten runners given plan A first and ten others given plan B first (which, statistically speaking, is a more powerful study design than an independent groups design). Can we then determine which training plan is better? How do we account for the cumulative effect of training and the effect of initial training on later training and on race results? How do we know that a runner's race performance is the result of his or her training in the six months leading up to that race, rather than the result of the previous six months of training? These are difficult questions for science to definitively answer.

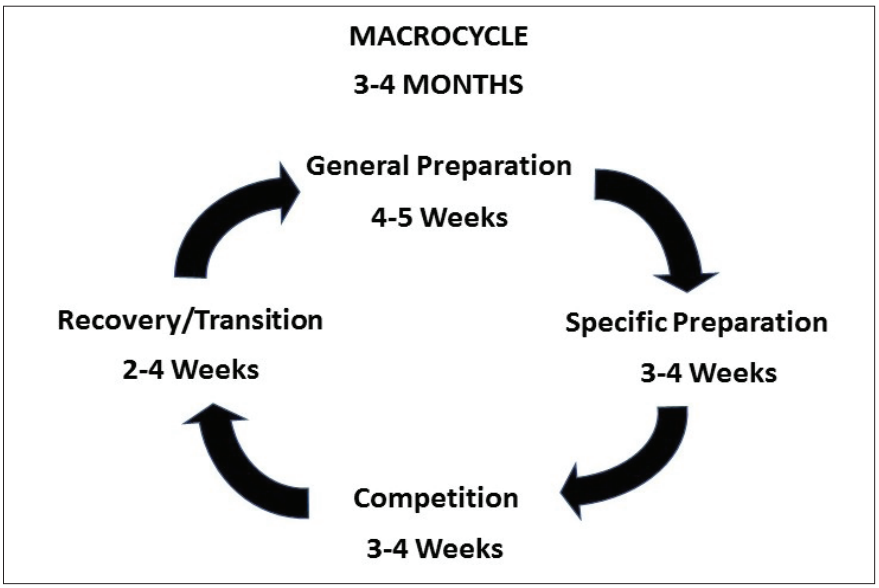
Before we discuss the different periodization models, it's helpful to review how the pieces of training are put together in a periodized plan.

MACROCYCLES

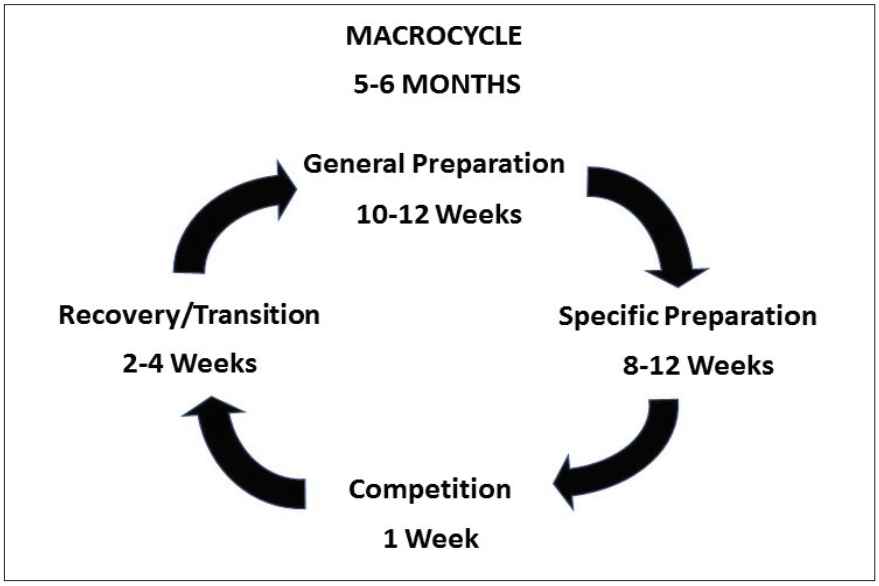
Periodization divides a year of training into major periods called *macrocycles*, which are about three to four months and most often comprise a single competitive season (e.g., a cross-country season or track and field season for a high school or college runner). In endurance sports like distance running, macrocycles are typically pieced together to create an annual cycle (which can be shorter than one year for less experienced/recreational runners), while shorter periods than a year are used for strength/speed/power sports. The training of elite athletes can also be planned with larger cycles, like four-year Olympic cycles or, similarly for serious high school and college runners, four-year school cycles.

Within each macrocycle is a *preparatory phase*, which is sometimes further divided into *general* and *specific preparatory phases*, a *competitive phase* that develops the specific competitive sport skills while maintaining the general physical performance achieved from the preparatory phase, and a *transition phase* of two to four weeks that serves as a recovery between macrocycles. The preparatory phase contains general, high-volume, low-intensity training to develop aerobic, cardiovascular, and metabolic characteristics and structural integrity, and the competitive phase contains specialized, high-intensity, low-volume training and races to develop anaerobic characteristics and the specific skills needed to race.

For runners who train for one target race, rather than plan the training for multiple seasons of racing with multiple races at the end of each season, it's better to either lengthen the duration of the three- to four-month macrocycle with longer general and specific preparation phases and a short (one week) competition phase, or piece two or three macrocycles together with shortened one-week competition phases for benchmark races leading up to the target race and eliminating



Periodization Phases for One Target Race



the recovery/transition phase until after the target race.

MESOCYCLES

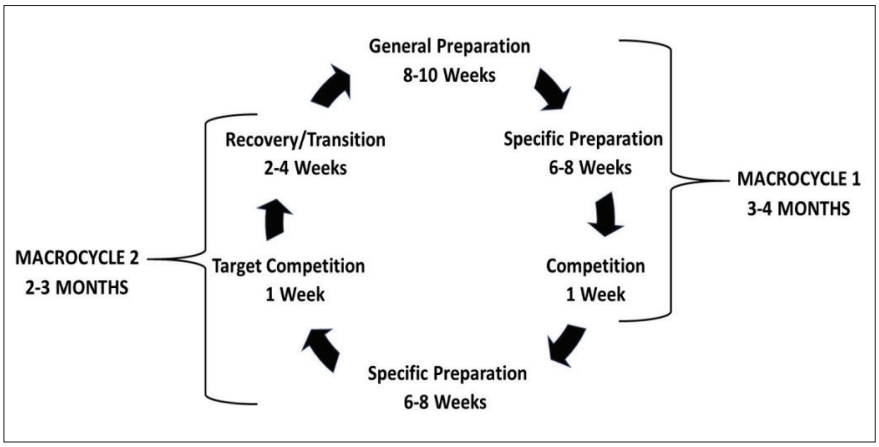
Macrocycles are divided into medium-size *mesocycles*, which typically last three to six weeks. Each mesocycle has a theme, with one or two training objectives, or targets. The mesocycle is the "scene" of the training program. Like the director of a movie, the coach decides on the theme of the scene to meet the overall fitness objectives. As fitness improves, each successive mesocycle should involve average greater training loads than the cycle just completed.

Regardless of the race distance for which your athletes are training, the initial mesocycles are similar because the purpose is similar—to increase aerobic capacity. The differences lie in how high the weekly volume gets and how much time you devote to the development of aerobic capacity, with longer races like the half-marathon and marathon requiring higher volume and more time on the aerobic component than shorter races like 800 meters, 1,500 meters/mile, and 5K. However, these differences are not as major as you might think since all races that take longer than two minutes are more aerobic than anaerobic, so even training for a one-mile race requires a lot of aerobic training. The major differences in the training program come later, as paths diverge through the specific preparation and competition phases.

MICROCYCLES

Within each mesocycle are several (3 to 6) smaller periods called *microcycles*, which are typically one

Periodization Phases for One Target Race (2 Macrocycles)



week. It's likely that seven days is used to align with the weekly calendar rather than because that is the optimal time for adaptation and the repetition of a specific stressor. There doesn't seem to be anything magical or scientific about seven days. Microcycles could last longer, like 10 to 14 days, depending on their objectives, the runner's time frame for adaptation, and the amount of time needed for recovery between workouts.

THIS MODEL OF PERIODIZATION IS CALLED LINEAR PERIODIZATION BECAUSE THERE IS A DECREASE IN VOLUME AND MATCHED INCREASE IN INTENSITY OVER TIME.

The microcycle is the "working unit" of the training program. Every microcycle should have its own specific objectives, which are integrated with the objective of the entire mesocycle. Like the movie director, the coach directs the training and prescribes the specific work based on the theme of the scene.

Think of the training cycles as a house.

The macrocycle is the fully-constructed house.

The mesocycles are the rooms of the house.

The microcycles are the furniture in each room.

One macrocycle (house) has 2 to 5 mesocycles (rooms) that have 3 to 6 microcycles (furniture) in each.

Now, let's take a look at the different models of periodization. Because there is not just one way to build the house.

LINEAR PERIODIZATION

The traditional periodization model of training that many elite runners and coaches have adopted and that has trickled down to nonelite runners is rooted in Soviet Union training theory, which was based on the premise that general (aerobic endurance) training should precede specific (anaerobic speed) training, in part because it was believed that a well-developed foundation of endurance, achieved by high-volume/low-intensity training, is crucial to tolerate and respond optimally to an increase in training intensity. Thus, the traditional model of periodization begins with a steady increase in low-intensity volume and, as training progresses throughout a macrocycle, initial mesocycles are of higher volume and lower intensity and later mesocycles are of higher intensity and lower volume. This model of periodization is called *linear periodization* because there is a decrease in volume and matched increase in intensity over time. In reality, linear periodization should be called *curvilinear periodization*, since the changes in both volume and intensity are not (and should not be) linear.

Linear periodization is largely theoretical and traditional in nature, validated only by athletes' success. Controlled studies on the physiological and performance results of long-term linear periodization, especially on distance running performance, and studies comparing the effects of linear periodization to other types of periodization, are scarce.

It seems to me that linear periodization, progressing from high volume/low intensity to low volume/high intensity, makes sense for shorter races, from 800 meters to 5K. The end of the macrocycle includes the highest intensity of training and most closely matches the intensity of the upcoming races, which means that your athletes are doing the most race-specific work as they get closer to the races.

GENERAL PREPARATION PHASE

During the general preparation phase of a linear periodization program, the initial emphasis is on general endurance by building up the weekly volume. The intensity of daily runs should be low, about 70 to 80 percent max heart rate (65 to 70 percent VO_2max) for 30 minutes to about 90 minutes (longer if training for a half-marathon or marathon). Runs should feel gentle and should build your athletes up rather than tear them down. It's easy in this phase to run too fast, in part because there are no hard workouts tomorrow for which your athletes need to be ready. But this phase is not about pushing the pace. Runners must be disciplined to run easy, and to accumulate more and more easy running over time.

When increasing volume, first increase the duration of each run. Longer single runs build endurance. If your athletes run less than 40 to 50 miles per week, it's better to run just once per day. If their runs reach an average of exceeding an hour per day, increase their volume by running twice per day a couple of times per week. Double runs enable your athletes to increase

their training load while minimizing stress. With two runs, they also get two hormonal responses and thus two opportunities for adaptation, because they have more frequent signals for protein synthesis.

Among elite endurance athletes (and presumably also for everyone else), a large training volume during the general preparation phase appears to be an important characteristic for exceptional athletic performance several months later, although it is not clear why. There is very little documentation regarding the correlation between training in the preparation phase and physiological capacity or performance in the competition phase months later. Scientific studies always test subjects immediately prior to, during, and immediately after a training intervention, not again months later. As mentioned previously, one of the assumptions of periodization is that it can predict future responses from the training your athletes do now.

SPECIFIC PREPARATION PHASE

The weekly running volume continues to increase through the specific preparation phase of the linear periodization program, as your athletes focus on specific quality endurance, with fartleks and threshold runs to raise their acidosis threshold, which train their ability to hold a faster aerobic pace. Easy runs should continue in this phase as you add one to two threshold workouts per week. These workouts can be continuous threshold runs, interval workouts, or fartleks.

The next part of the specific endurance phase includes aerobic power (VO_2max) training, through the use of interval workouts that train the cardiovascular system's ability to deliver oxygen to the working muscles. The cardiovascular adaptations associated with interval training, including hypertrophy of the heart's left ventricle and a greater maximum stroke volume and cardiac output, increase your athletes' VO_2max, raising their aerobic ceiling. Cardiac performance is a primary determinant of VO_2max. In comparison to acidosis threshold training, which is mostly about what's happening in the runner's legs, the site of adaptation of VO_2max training moves from the skeletal muscles to the cardiovascular system. Thus, the most powerful stimulus for change in cardiac function (VO_2max) is different from the most powerful stimulus for change in skeletal muscle aerobic capacity (acidosis threshold). This is one of the reasons why improvement in VO_2max takes less time (weeks to months) than improvement in the acidosis threshold (months to years).

OF THE FIRST THREE PHASES, THE COMPETITION PHASE IS THE MOST VARIED BETWEEN RUNNERS.

For most runners who train for 5K, 10K, half-marathon, and marathon, threshold training and VO_2max training, together with continued high-volume/low-intensity training that improves running economy, are enough for the specific preparation phase, since those races are most influenced by those physiological factors. For runners training for middle-distance races (800 meters to 3,200 meters), some anaerobic capacity training that targets anaerobic glycolysis (speed endurance) should also be included in this phase.

COMPETITION PHASE

During the competition phase, the training transitions from aerobic metabolic and cardiovascular work to anaerobic metabolic and muscular work, with anaerobic capacity (speed endurance) and races taking center stage. Weekly volume begins to decrease as intensity increases.

Of the first three phases, the competition phase is the most varied between runners. For example, a high school track runner may have a series of important short races (from 800 meters to 3,200 meters) in the span of one month, while a marathon runner may have one important long race on one day. The number and duration of these races will dictate exactly what training is done in the competition phase. An 800-meter runner and miler will do a considerable amount of anaerobic speedwork, while a marathon runner will spend more time developing him- or herself aerobically and doing more race-specific endurance training.

RECOVERY/TRANSITION PHASE

Runners would love to run at their peak all year round. However, physiological peaks are rather fleeting and, after they occur, continuing to train with more volume and intensity doesn't do any good; it's better to work in peaks and valleys. So it's important to come off that peak and recover: that enables the athlete to train to reach a higher peak later in the year. Thus, the final phase of a linear periodization training program is recovery/transition, during

which your athletes recover from the previous training and racing and get ready, both physically and psychologically, for the beginning of a new macrocycle. This phase includes a combination of complete rest, cross-training, and perhaps some very easy, short runs. In general, the longer the preceding buildup (macrocycle), the higher the volume, and the longer the targeted race just completed, the longer the recovery/transition phase.

Part 2 of this series on periodization will discuss reverse linear periodization.

Dr. Jason Karp is a coach, exercise physiologist, bestselling author of 12 books and more than 400 articles, and TED speaker. He is the 2011 IDEA Personal Trainer of the Year and two-time recipient of the President's Council on Sports, Fitness & Nutrition Community Leadership award. His REVO$_2$LUTION RUNNING™ certification has been obtained by coaches and fitness professionals in 25 countries. In 2021, he became the first American distance running coach to live and coach in Kenya. Running Periodization and his other books are available on Amazon.

REFERENCES

1 Cunanan, A.J., DeWeese, B.H., Wagle, J.P., Carroll, K.M., Sausaman, R., Hornsby III, W.G., Haff, G.G., Triplett, N.T., Pierce, K.C., and Stone, M.H. The General Adaptation Syndrome: a foundation for the concept of periodization. *Sports Medicine,* 48(4):787-797, 2018.

2 Kiely, J. Periodization paradigms in the 21st century: evidence-led or tradition-driven? *International Journal of Sports Physiology and Performance,* 7:242-250, 2012.

3 Skinner, J.S., Jaskólski, A., Jaskólska, A., Krasnoff, J., Gagnon, J., Leon, A.S., Rao, D.C., Wilmore, J.H., and Bouchard, C. Age, sex, race, initial fitness, and response to training: the HERITAGE Family Study. *Journal of Applied Physiology,* 90(5):1770-1776, 2001.

4 Hubal, M.J., Gordish-Dressman, H., Thompson, P.D., Price, T.B., Hoffman, E.P., Angelopoulos, T.J., Gordon, P.M., Moyna, N.M., Pescatello, L.S., Visich, P.S., Zoeller, R.F., Seip, R.L., and Clarkson, P.M. Variability in muscle size and strength gain after unilateral resistance training. *Medicine and Science in Sports and Exercise*, 37(6):964-972, 2005.

5 Beaven, C.M., Cook, C.J., and Gill, N.D. Significant strength gains observed in rugby players after specific resistance exercise protocols based on individual salivary testosterone responses. *Journal of Strength and Conditioning Research,* 22(2):419-425, 2008.

6 Naclerio, F., Moody, J., and Chapman, M. *Applied periodization: a methodological approach. Journal of Human Sport & Exercise,* 8(2):350-366, 2013.

7 Bompa, T.O. *Periodization: Theory and Methodology of Training.* Champaign, IL: Human Kinetics, 1999.

8 Tønnessen, E., Sylta, Ø., Haugen, T.A., Hem, E., Svendsen, I.S., and Seiler, S. The road to gold: training and peaking characteristics in the year prior to a gold medal endurance performance. PLoS ONE, 9(7):e101796, 2014.

TRAINING TOP LEVEL 400-METER HURDLERS

BY MIKE THORSON, FORMER DIRECTOR OF TRACK & FIELD/ CROSS COUNTRY @ THE UNIVERSITY OF MARY (ND)

Some tips for training 400m hurdlers.

The 400-meter hurdles are considered one of the more demanding, difficult, and challenging events in track & field. There is no other event that requires an athlete to perform difficult technical skills while in an aerobic distress like the 400-meter hurdles. It is also an event that has a huge margin for error. Curtis Frye, the University of South Carolina coach, characterized the 400-meter hurdles best when he said, "To compete in the event, you have to be a long jumper, a high jumper, with the ability to train like an 800-meter runner, and have enough fast twitch to train like a sprinter." With that thought in mind, it is only natural that it can be quite demanding for a coach to design and implement successful training programs for top level 400-meter hurdlers.

The **objective** of this article is to illustrate the training, techniques and concepts that led to success for our long hurdlers at U Mary. Our training program was designed and customized to meet the needs of the Mary one-lap hurdlers in their own particular setting and training environment. Although many of the concepts and components will work in nearly all programs, it would most certainly need to be tailored (as all training programs do) to meet the demands of other athletes, programs, and environments. This article will specifically detail our 400-meter hurdle training principles. It will also include other training considerations, as well as key workouts and a sample training week.

THE MARY 400-METER HURDLE TRAINING PROGRAM WAS CONSTRUCTED AROUND THE FOLLOWING SIX KEY PRINCIPLES.

1. **The long hurdler must be trained to run an excellent open 400 meters. The race management skills that a 400-meter runner utilizes also must be employed by the 400-meter hurdler.**

#The best way to improve performance in the 400 hurdles is to **improve fatigue velocity.**

#The coach and athlete must understand that the one lap hurdle race is a **400 meter sprint** that includes **10 hurdles**. Adding the hurdles to the 400-meter equation totally changes the dynamic, but it is still a one-lap race and athletes must be prepared accordingly.

2. **Technical hurdle skills and mechanics must be trained using both legs.**

The hurdler must be trained to alternate legs. "The most valuable skill you can teach a developing hurdler is the ability to alternate lead legs over consecutive hurdles," according to the late Ralph Lindeman from the Air Force Academy, a coach who was a noted hurdle authority.

The hurdler should be directed to hurdle in training with the **non-preferred or secondary leg**, so that they are prepared to execute both in competition. Too many coaches allow their hurdlers to rely on the preferred leg in training, and it typically comes back to haunt them in competition.

Inefficient hurdle mechanics waste valuable energy resources that are needed in the event and are responsible for unneeded braking forces. Technical hurdle skills should be trained on a consistent basis throughout the year.

One of our basic coaching cues to our 400 hurdlers was to lead with the knee and accelerate the last several strides into the hurdle. The goal is to negotiate the hurdle with the least amount of deviation from the sprint stride.

FRONT-SIDE MECHANICS SHOULD BE MAXIMIZED, AND BACK-SIDE MECHANICS MINIMIZED.

3. **The 400-hurdler must be trained as a sprinter and there must be a steady diet of sprint mechanics.**

Front-side mechanics should be maximized, and back-side mechanics minimized. Just as in the sprints and short hurdle races, an excellent indicator of how well the athlete is shifting his movements toward the front of the body is the **amount of knee separation** on touchdown.

One of the best methods to improve non-fatigue velocity for long hurdlers is to **improve maximum velocity** in the short sprints. Enhancing maximum speed improves both sub-maximum speed and acceleration. As hurdle/sprint coach Gary Winckler always said, "A 400-hurdle coach should be consistently building a better sprinter."

Acceleration mechanics and drills should be a fixture on the training menu for 400 hurdlers.

A large percentage of training time should be devoted to **sprint mechanics**. This is an area that is under-coached at all levels, according to Winckler. The former University of Illinois and Florida State coach goes on to say that the longer the event, the more steps it will require to cover the distance. It stands to reason, he says, that the more efficient the runner can be with each step, there will be a higher likelihood of improvement, efficiency and performance.

Minimizing ground time is a major factor in producing fast 400-hurdle times and maintaining the needed higher levels of horizontal velocity. This obviously requires a large amount of strength and energy and results in a compromise between balancing speed in the 400-meter race with available speed endurance.

4. **The athlete must be trained to hurdle and maintain focus in a fatigued state.**

Hurdling in a fatigued state can be extremely challenging and the athlete must experience this in training to develop the coping skills that will be needed in competition.

A sizable portion of the fatigue-based training should be completed over combinations of hurdles at **hurdle tempo pace** instead of sprint tempo. Fatigue-based training should include a great deal of training over different combinations of hurdles that include the athlete running not only at the desired stride pattern, but making the transition to the alternate stride patterns as well. **Replicating in training the stride patterns that will be enacted in competition is central to success in the long hurdle race.**

The 400 hurdler must be trained to make adjustments/ decisions and not be distracted by forced changes in stride pattern due to any number of uncontrollable factors. Concentration and the ability to **maintain focus** are characteristics of great intermediate hurdlers.

5. **Athletes must have a prearranged, rehearsed race plan and strategies for how they will manage the race and make the needed transitions.**

400 hurdlers must possess excellent **kinesthetic abilities** in order to modify and adapt their stride pattern based on weather, lane assignment and technical issues.

There are many types of race models and stride patterns that can be implemented. A stride pattern of 13 strides between hurdles for men and 15 for women is commonly used by elite long hurdlers. The pattern typically transitions to 14 and 16, respectively, as the athlete fatigues and the hurdler begins to alternate, normally between the sixth and seventh hurdlers for high level performers. The transition could be hurdle 5 or 6 for less experienced hurdlers. It is certainly better to have a planned program transition than a "forced" transition. There are many types of patterns and race models that can be used by elite hurdlers. Several examples that demonstrate this: former world record holder Kevin Young used the following pattern when he ran 46.78 to win the 1992 Olympic gold: 20 strides to the first hurdle, 13 strides to 2-3, 12 strides to 4-5, and 13 strides to 6-10. Olympic silver medalist, Rai Benjamin of the USA uses a right-leg lead 13-stride pattern. As does Karsten Warholm, the men's world record holder at 45.94. Dalilah Muhammad of the USA, the gold medalist in the 400 hurdles at Rio, used 15 strides for hurdles 1-8 and 16 strides for 9 and 10 when she set a women's world record in 2019.

The ideal stride pattern would be an odd number of steps between all hurdles. The 13, 15, 17, 19 stride pattern assures that the hurdler will take all the barriers with the same left leg.

An even number stride pattern will force the hurdler to **alternate** consecutive hurdles.

The hurdler who leads with the left leg will have a definite advantage, with less distance to run on the corners and the fact that no adjustment needs to be made with the hurdler "squaring up" to the hurdle. A right-leg lead will require the athlete to run further out in the lane and can create undesirable rotation upon landing. Thus, all developing hurdlers should be taught to use a left leg lead and have the ability to alternate when factors such as fatigue and weather dictate.

The following information can be used to determine the optimal number of strides to the first hurdle and the resulting stride pattern between the barriers:

21 Strides to First hurdle—13 Strides Between

22 Strides to First Hurdle—14 Strides Between

23 Strides to First Hurdle—15 Strides Between

24 Strides to First Hurdle—16 Strides Between

25 Strides to First Hurdle—17 Strides Between

Race Distribution: A relatively even-paced race model is the most efficient manner to run the intermediate hurdle race. Both the athlete and coach must understand this. A coach can effectively monitor this using touchdown times. These can be recorded and then reviewed and analyzed in a debriefing with the athlete, using the assistance of video to correct errors and to determine late-race adjustments. An excellent "tool" for the coach is to use 200-meter split times. Ideally, according to most coaches, the difference in times for the first and second half of the race should be no more than 5%. As an example, that would be approximately 2.5 seconds in a 50 second 400-hurdle race. One of the keys to a successful race plan is to control the energy distribution the first 150 meters of the race. We always advocate, however, a fairly fast start. But with a healthy dose of realism. There is no need to go out in 24.25 for the first 200 meters like Sydney McLaughlin did in her world record 50.68 clocking at the World Championships in Eugene, Oregon, if you are a female running 61 second 400-meter hurdle times. Hurdle 4 is the 150-meter mark in the 400-hurdle race and an excellent checkmark.

A hurdler must make stride adjustments well in advance of the hurdle and not in the last few strides to the barrier. Last second adjustments and modifications typically result in poor hurdle clearance and a failure to maintain a smooth running rhythm and the correct stride pattern.

6. **A very consistent approach and stride pattern to the first hurdle is vitally important and must be rehearsed repeatedly.**

The acceleration and stride pattern to the first hurdle is important to establish the proper rhythm and stride pattern between hurdles. **The first hurdle approach and clearance sets the tone for the entire race.** We always emphasize to our hurdlers the importance of establishing the proper rhythm to hurdles 1-2, with success over the first two hurdles typically resulting in an excellent performance for a well prepared athlete.

Elite male hurdlers will use **20-22 strides** to the first hurdle. Elite female hurdlers will typically employ **22-25 strides** to the first hurdle.

The **lead leg** will be in the **back block** if the hurdler uses an even number of strides to the first hurdle. The **lead leg** will be in the **front block** if the hurdler uses an uneven or odd number of strides.

Both the coach and the athlete should be alert to the fact that a well-rested athlete can eliminate an entire stride to the first hurdle. A wind at the back of the hurdler or an athlete who is very energized and "highly aroused" in a high-level competition can also eliminate a stride. I have also seen athletes that had to add a stride due to wind or a poor start.

THE ACCELERATION AND STRIDE PATTERN TO THE FIRST HURDLE IS IMPORTANT TO ESTABLISH THE PROPER RHYTHM AND STRIDE PATTERN BETWEEN HURDLES.

A useful tool to determine the number of strides to the first hurdle is to put a mark on the track at approximately **43.40 meters** from the start and have the athlete attempt to hit it with the desired takeoff without a first hurdle present. Tape or some other item can mark the location of the first hurdle at the 45-meter mark.

KEY WORKOUTS

We are always reluctant to share training because of "monkey-see, monkey-do" coaches and their lack of context, but we have listed several workouts that have worked well for our 400 hurdlers throughout the years. The goal for all our training sessions is to have a positive experience; a positive outcome that leads to success in competitions.

1. 1 x 350m @ Race Pace w/ spikes with Hurdles 1-4 (15 minutes recovery); 2 x 300m @ 98% w/spikes (10-12 minutes recovery)
2. Flying 30's w/spikes followed by 1 x 300m @ 98% w/spikes (10 minutes recovery) 2 x 3 x 200m w/flats@ 85% (2 minutes recovery/4 minutes recovery for set) High Volume Workout (High for our program because we are very low volume): 1500m (Should likely be done in a period where there are no meets to prepare for)
3. Flying 30's w/spikes followed by 1 x 300m @ Race Pace w/ spikes with Hurdles 1-5 or random if indoors (12-15 minutes recovery) 2 x 300m @ 85% w/ flats (5 minutes recovery)
4. 1 x 350m @ 90% w/spikes (12 minutes recovery) 1 x 200m @ 95% w/spikes (10 minutes recovery) 1 x 200m w/spikes @ Race Pace w /Hurdles 1-2
5. In & Outs w/spikes followed by 1 x 350m @98% w/spikes (12-15 minutes recovery) 3 x 150m @ Race Pace w/ Hurdles 1-2 (4-5 minutes recovery) Workout can be done by running hurdles 8-9-10 and finish as well instead of running Hurdles 1-2
6. 1 x 300m @ Race Pace w/ spikes w/ Hurdles 1-5 (12-15 minutes recovery) 1 x 300m @ 98% w/spikes
7. Hurdle 1 x 3 from start@ Race Pace followed by 1 x 350m @ 90% w/spikes(12 minutes recovery) 1 x 250m @ 95% w/ spikes (10 minutes) 1 x 150m @ 98% (Progressive Workout where intensity increases each interval)
8. Flying 30's w/spikes followed by 1 x 350 @ Race Pace w/spikes w/ Hurdles 1-6 (15 minutes recovery) 1 x 300m @98% w/ spikes (12 minutes recovery) 2

x 150m @ Race Pace w/spikes w/ Hurdles 1-2 or hurdles 8 & 9 (5-6 minutes recovery)

9. 1 x 150m @ Race Pace w/ spikes w/ Hurdles 1-2 (6 minutes recovery) 1 x 200m @ Race Pace w/spikes w/ Hurdles 1-3 (10 minutes recovery) 1 x 300m @ Race Pace w/spikes w/ Hurdles 1. Can modify and do Hurdles 6-10

SAMPLE TRAINING WEEK 29—APRIL 3-9

Although training should always be viewed in context, customized, and tailored to meet the individual needs of the athlete, we have offered a glimpse into one of our actual training weeks used in the competition portion of the season. It is an outdoor weekly schedule for a female who competed in both hurdle events.

Monday, April 3—1 x 350m w/ spikes @98% (15 minutes recovery) 2 x 200m w/spikes @ 98% (8-10 minutes recovery) 1 x 150m w/ spikes @ 98%

Tuesday, April 4—100m Hurdle Technique w/Flying 20's incorporated into session

Wednesday, April 5—1 x 350m-300m w/spikes @ 98% (15 minutes recovery) 350m w/ Hurdles 1-2 & 8 @ race pace

Thursday, April 6—100m and 400m hurdle technique work (light)

Friday, April 7—Pre-Meet Warm-up, Relay Exchanges

Saturday, April 8—Bortke Open, Bismarck ND (Bowl)

Sunday, April 9—Recovery--Warmup on own, Stationary Bike or Elliptical —15 minutes steady pace

TRAINING CONSIDERATIONS

1. As stated earlier, one of the best ways to improve the 400-meter hurdler is to **improve maximum velocity**. The ability to generate short sprint velocity is critical to success in the 400 hurdles. Unfortunately, pure speed training is often neglected in the training of long hurdlers, especially if the hurdler does not do the sprint hurdles. We certainly didn't require our hurdlers to do both hurdle events like some coaches do. Regardless, the goal of coaches should be to train absolute speed and activate the CNS as frequently as possible. We have always emphasized in our training programs that speed should always be trained concurrently with the other energy systems. Although some coaches hesitate to combine energy systems, there is no reason to not train different energy systems in one session if you want to utilize time and energy to the utmost. We did that very successfully for many years. Some examples of combined energy system training: 1. 4 x Flying 30m w/spikes (4-5 minutes recovery between 30's) (8-10 minutes recovery following 30's) 3 x 150m w/spikes @ 98% (6 minutes recovery) 2. 3 x 40m from Blocks (4-5 minutes recovery /rep) (10 minutes recovery) 1 x 350m @ 98% w/ spikes. I was guilty of not training enough pure speed until midway through my career. Coaches are reminded too that acceleration is not pure speed. That was another mistake I made as a young coach—mistaking acceleration work for absolute speed.

2. The basic mechanics of hurdling apply in the 400 hurdles. It is a serious mistake to neglect the technical aspects of intermediate hurdling because of the lower heights. Although the hurdles are lower, the fatigue factor the hurdler faces will magnify any technical errors. Long hurdlers who do not compete in the sprint hurdles can and should train most of the same drills as 100m/110m hurdlers. We had a lot of long hurdlers who did not do the sprint hurdles at Mary, but they certainly were trained with many of the same drills and principles as the hurdlers in the 100 and 110m hurdles. It has long been our belief, however, that many coaches overdrill. Not that some drills can't be critically important, but **needless hurdle drills that do not transfer to competition should not be included.**

3. Hurdle **volumes** can be much higher in weeks when there are no competitions scheduled. They should decrease as the season progresses, especially as the training cycle moves into the championship season.

4. The number of hurdles to be included in the interval sessions can be increased or decreased depending on the needs of the individual athlete and the training area—indoors or outdoors. The spacing can also be altered depending on the training facility and size of the indoor track. The standard spacing of 35 meters should obviously, however, be employed as much as possible

and is certainly very doable with many facilities now having a 300-meter track. Coaches who maintain it is nearly impossible to train on a 200-meter track need to be more creative. Our 400 hurdlers were faced with training on a tight 160-meter indoor oval for most of my tenure at Mary.

THE BEST TRAINING FOR THE 400 HURDLES IS COMPETITION.

5. Train **all segments** of the race. Many coaches stress the first hurdle and first 200 meters, but neglect the all-important second half of the race.

6. There is no substitute for actual experience for the athlete who competes in the 400-hurdles. Most coaches can agree it is exceedingly difficult to mimic the 400-hurdle race in training. Thus, the more frequently the athlete can compete in an actual race, the more efficient the stride pattern will become and more comfortable the hurdler will be with the overall race model. **The best training for the 400 hurdles is competition.** The biggest limiting factor for our 400 hurdlers was the weather that they faced in the Upper Midwest. We often did not move outdoors until the end of March, sometimes later. Several times we arrived in California for an early spring meet the first part of April without having been outdoors and our hurdlers were faced with competing over the full 10 hurdles for the first time. We did, however, do a great more 400-hurdle work indoors than most programs.

7. **Recovery** is a critical component that coaches need to address for the 400 hurdler, especially if the athlete is a dual hurdler. The training demands for the hurdler require built-in recovery in the athlete's training schedule.

8. Post-race **analysis** between the athlete and coach, video and the use of touchdown times and charts are of paramount importance in the success of the 400-meter hurdler.

9. **Flexibility** is a component that must be trained. Increased flexibility will decrease muscle resistance and allow easier movement throughout the range of motion. Often as coaches we engage in training that decreases flexibility and elasticity. Flexibility must be trained on a consistent basis.

10. I am often asked about **strength training** and what we did during my tenure at the University of Mary. We had a remarkably simple program. So, an easy, simple answer. We had a very traditional strength program administered by our strength and conditioning staff in the fall and through December and the beginning of meets. A **minimal maintenance** program based on functional strength and personalized to meet the needs of the individual athlete, emphasizing plyometrics, medicine ball circuits, etc. was the primary focus in-season. The end goal for our **strength training: Strength must translate to power for the hurdler!**

11. Speaking of simple, **simplicity** is something we always advocated in our training programs. Many coaches make the 400 hurdles much more complicated than needs be. I have seen the long hurdles both under-coached and over-coached. Over-coached may be worse, as it typically overwhelms the athlete. I like a quote from Curtis Tyrone Jones, the author of "Guru in the Grass." He says, "Wise is the one who learns to dumb it down." Well said. **Keep it simple!** The same can be said for coaches who feel everything has to be hard. "It doesn't have to be hard to be good," says Vern Gambetta, a former track and field coach and one of the leading training authorities in the world.

FLEXIBILITY MUST BE TRAINED ON A CONSISTENT BASIS.

12. Long-term planning of an athlete's development in the training process is one of the most difficult tasks a coach will face. Coaches are always seeking the optimal training plan for their athlete, but it is critical to keep the big picture in mind. Reece Vega, a highly successful sprint/hurdle coach from North Dakota State University and a coach I worked with at Mary, had a good reply when I asked him if he coached men and women 400 hurdlers differently. "I wouldn't say I coach women differently than men, but I coach freshmen differently than I coach seniors," said the third- year NDSU coach. We always told our Mary athletes if they are still doing the

same training as a senior as they did as a freshman, we have a serious problem, either with the coach or the athlete. **An athlete must evolve and progress in their training as they mature if they are to be truly successful.** A Vern Gambetta quote that is very appropriate here: **"Training needs to be progressive, sequential and systematic."**

13. One of our primary goals for 400-meter hurdle training: **Training should mirror performance.** A great quote from retired, legendary Texas A & M coach Vince Anderson: "Training should look like the performance."

SUMMARY/CONCLUSION

A recurring theme throughout my coaching career was a constant search for new training methodologies that would propel our athletes to be faster and allow them to continue to improve. I like the phrase coined by former Colorado distance coach and author Jay Johnson when he talks about improving: "If you want to do things you've never done before, you have to do things you have never done before." There was always something right around the corner that we felt could do. No big, deep, dark secrets. But something concrete and tangible in the training world. We just had to find it, and more importantly, be open to change. Meaningful change, or "purposeful change," as Vern Gambetta says. That isn't always easy. Change can be painful. Uncomfortable. Not just in coaching, but in all walks of life.

Change wasn't easy for me, but it is a must if a coach is to continue to evolve and improve and optimize training programs for his athletes. Ongoing learning and improvement as a coach never really stops. Not for the great coaches anyway. James Clear, the author of a best-selling book entitled *Atomic Habits*, sheds some light on this with the following thought: "The gift of a beginner is fresh eyes. The longer you are in a field, the harder it is to perceive new truths. Your mind is biased toward refining what you already are doing instead of exploring new terrain. Take your expertise and apply it to something else."

We understand that all coaches have their own unique methods and ways of training one-lap hurdlers. This article has offered our perspective as to what has worked for our program and our hurdlers at our university. We hope it will provide useful information, insight, guidance, and invoke coaches to challenge themselves in their quest and continuing journey to enhance and refine their training regimens for their 400-meter hurdlers.

REFERENCES

1. Anderson, Vince, formerly of Texas A & M, articles, clinics
2. Frye, Curtis, University of South Carolina, clinics, articles
3. Gambetta, Vern, Vern Gambetta Blogs, Gambetta Sports Training Systems
4. Lindemann, Ralph, US Air Force Academy, Clinics, Articles
5. McFarlane, Brent, *The Science of Hurdling and Speed*, 4th Edition, Canadian Track & Field Association, 2000
6. Sherman, Amelia, former assistant coach at the University of Mary, editing, conversations, information
7. Silvey, Steve, *World Class Elite Hurdling Training Program*, 1999, Clinics
8. Vega, Reece, North Dakota State University, Conversations
9. Winckler, Gary, University of Illinois, Clinics, Conversations, Articles

USATF COACHING EDUCATION

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https://www.usatf.org/programs/coaches/calendar-of-schools

Sept 30-Oct 2	Level 1 – Community College of Philadelphia, Philadelphia, PA
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Oct 8-9	Level 1 – Alhambra High School, Phoenix, AZ
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Oct 28-31	Level 1 – Zoom #2022-43 (EDT)
Nov 11-14	Level 1 – Zoom #2022-45 (EST)
Nov 18-20	Level 1 – Zoom #2022-46 (CST)
Nov 25-27	Level 1 – Zoom #2022-47 (PST)
Dec 9-11	Level 1 – Zoom #2022-49 (CST)
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USATF annually recognizes coaching professionals for outstanding contributions and service to coaching education. Examples of qualifying service include: being a frequent speaker/contributor at USATF Level 1, 2, or 3 Schools, history of service at the club, state or national level, frequent contributor of articles, videos or books that strengthen the professionalism of coaching, mentoring beginning coaches/students in the sport, and offering support to the Coaches Education Committee to strengthen curricula, outreach, and public relations. Awards are presented at the Annual Meeting during the Coaching Education General Session. Nominations will be accepted online through **October 2, 2022**.

Awards

- Joe Vigil Sports Science Award
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- Fred Wilt Educator of the Year Award
- Vern Gambetta Young Professional Award
- Terry Crawford Distinguished Female in Coach Award
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The Emerging Female Grant is provided by USATF and provides a select number of minority women track and field coaches the opportunity to attend USATF Coaching Education Level 1, 2, or 3 Schools or approved USATF specialty courses. A limited number of Emerging Female Grants are available at remaining 2022 Level 1 Schools. Recipients must be minimally USATF 3-Step SafeSport Compliant. Grants are valued at $210 for Zoom and $500 if attending an in person Level 1 School (includes travel expenses and registration fee).

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Please note all 2022 Emerging Female Grants for Level 2 have been awarded.

USATF COACHING EDUCATION INSTRUCTOR SPOTLIGHT

An interview with Dr. Wendy Truvillion, Alhambra High School (AZ)

Dr. Wendy Truvillion is The Assistant Principal of Athletics at Alhambra High School in Phoenix, Arizona. She was a six-time NCAA All-American at LSU and former track coach at Georgia Tech and Penn State University. Truvillion presently serves as the USATF Women's Track and Field Vice Chair, Women's Commission Vice Chair, Junior/HS Focus Group Co-Chair, World Athletics Coaching Matters Virtual Forum host and Adjunct Professor for Grand Canyon University. Truvillion has served on over 20 USA international teams, taught in over 40 Level 1 Schools, and is the USATF Level 1 Region Coordinator for the Southwest. In 2015, Truvillion received the Terry Crawford Distinguished Female in Coaching Award.

Dr. Wendy Truvillion

MR: Wendy, I've made a habit of starting with this question, and why not keep the streak alive? Tell us how you got started in coaching, and second how you got involved with USATF?

WT: After finishing my eligibility at LSU in 1982 I moved to Atlanta. Dee Todd, the head coach at Georgia Tech, was leaving GT for the ACC office and she reached out to my LSU coach and asked him to recommend an African American female coach to take over her position at Georgia Tech. My coach stated that one of his top athletes, Wendy Truvillion, had just relocated to Atlanta and may be interested in coaching. When I got the call from Dee Todd to consider taking her job, I was flattered and scared to death to go into coaching, but I took it as a challenge and as an opportunity to get back into the sport that I had just left. I accepted the job as Georgia Tech's Assistant Women's Track coach. Seven years later I became the Head coach. During the seven years as assistant coach, I began attending the USATF convention to network with other coaches and continue to learn from mentors like Evie Dennis, Stephanie Hightower, Sue Humphrey, and Duffy Mahoney. When I got the job at Georgia Tech, I flew back to Baton Rouge to meet with my former coach, and he walked me through the Level 1 School course material to refresh my memory on all my training as an athlete. He taught me how he set up workouts, how the energy system worked, and why "drills" were important. I immediately took a liking to the Coaching Education, so I began my USATF certifications: Level 1, Level 2, ITC, and soon began hosting Level 1 schools.

MR: You recently returned from World U20's in Cali, Columbia where you hosted a daily show with World Athletics interviewing team staff coaches across all countries. Share with our readers some of the insights from the various team coaches, and if you can, please share where they can find these resources online. I particularly enjoyed your interview with Carmelita Jeter, Team USATF Women's Assistant Coach (Sprints/Hurdles), where Coach Jeter broke down the role of a team staff coach and the "do no harm" philosophy.

WT: Being put in charge of the Coaching Club in Cali, which was similar to the club in Eugene, was one of the most memorable and fulfilling experiences of my career. I created the onsite interviews which we called "cameo's" to add a more entertaining presentation of the coaches' perspectives of the U20 championships. I was told to be creative and make the Coaches Club interactive and informative, so I developed the format of "cameo" interviews of coaches "in the trenches" and on set interviews (similar to Eugene) with select coaches coupled with the expert panel of coaches to review and preview the meet performances. They were called "one-take Wendy" when I conducted the cameo interviews at the track and at the practice track with coaches from all over the country. The cameo interviews were presented during the onset coaches interviews to add to the dialogue. As the moderator of the coaches interviews my job was to guide the discussion by the guest coaches and expert panelist around the theme of "preparing U20 athletes for senior level competition". This theme centered around the statistical data that shows

only 6% of U20 and youth athletes progress onto the senior and elite level of competition. Most of the international coaches shared their expertise on how they train their athletes to compete and prepare for top level competition. The Coaches Club material will be housed on the World Athletics website under "webinars" for all coaches to review. Most rewarding was my interview with Carmelita Jeter as she shared her progression from youth athlete to elite athlete to Olympian and World record holder. Her humbling experience and progressions were highlighted by her quest for her Level 1 School certification to improve her coaching expertise and her encouragement for all coaches to "keep getting educated". It was exciting for me to have her share that Level 1 School experience because she attended my Level 1 school as a student. Being able to contribute to her educational progression into coaching was a monumental moment for me as a Coaching Education instructor. Imagine having an Olympian and World Record holder in your class as a student and then interviewing her in an international competition. It was great.

MR: As an advocate for women in the sport and your seat on the Women's Commission, what advice would you offer to other aspiring female coaches and administrators?

WT: The advice I would give to aspiring female coaches and administrators would be to "keep getting educated", similar to what Carmelita Jeter said. Women in coaching must always come to the table for coaching jobs with more education than men coaches. Women have to prove themselves more and more competent in order to be considered for the bigger jobs. I would advise women to attend coaching education schools, clinics, and conferences; gender equity conferences, leadership conferences and seminars, and acquire a mentor to advise them in their quest for coaching jobs at the high school and/or college jobs. I would advise women to be confident, professional, and perseverant and to always perform as if someone is watching them because you never know when you may be in the room with your "next boss".

MR: Lastly, you earned All-American status, relay, and team titles while at LSU, have traveled across the world supporting over 20 USATF delegations in manager and coach roles, and numerous other personal achievements and accolades in the sport. To this point, what stands out to you as the most memorable or proudest moment in your years involved in the sport of track & field, and why?

WT: Most memorable moments are those as head coach, assistant coach, and/or head manager of our USA teams. Working with the USA's top athletes at the senior level, junior level, and youth level has been the most rewarding for me. Working behind the scenes to support and enhance the athletes' performances directly and indirectly gives me a sense of personal accomplishment similar to my own personal accomplishments when I was an athlete at LSU. Carmelita said it in her interview with me, that she gets "butterflies" for the athletes like she did when was an athlete. I get the same "butterfly" feeling (as if it is me performing) when the USA athletes are performing. Being a behind the scene support for our USA athletes, and encouraging them to be confident and "get it done" gives me my own unique feeling of accomplishment. I have two most-proudest moments involved in the sport of track and field: One was when I ran on my LSU 4x400 meter relay team in 1985 where we won the relay and clinched the 'team' title. Second was as the USA head coach for the 2000 World Junior Championships in Barcelona, Spain. Our women's 4x400 meter relay team was disqualified because they lined up "out of the zone" in error. After being disqualified, Duffy Mahoney filed a protest and I traveled with him to the TIC area to review the video which showed the meet official putting our USA athlete at the end of the zone and not at the beginning of the zone. Duffy dialogued, calmly with the meet officials and we were allowed to run (under protest) alone to get a lane in the finals. In doing so, we were allowed to run in the finals where we won the 4x400 relay. I had a deep feeling of despair while we waited (3 hours) for permission to run alone. After winning I was never more proud to be an American and a part of the best country in the world and the most rewarding sport of all times.

MR: Wendy, thank you again for being a part of this feature. It was great to learn more about you and share your story with our community. USATF members interested in learning more from Dr. Wendy Truvillion can catch her next (alongside Sue Humphrey and Simone Terry) at the USATF Level 1 School, Alhambra High School (AZ), October 8-9, 2022.

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