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(Greg Huffaker): Hello. And welcome to another addition of Illinois Top Times podcast.

Our mission at Illinois Top Times is to provide a premier indoor championship meet for athletes and coaches that will help promote collegiate recruiting and future participation from Illinois high school athletes.

The goal of the podcast is to provide some resources to help athletes and coaches learn from the very best in our sport. I hope you got an opportunity to listen to our podcast about 400-meter training. And we have the pleasure again of talking with Boo Schexnayder, the Strength and Conditioning Coach at LSU.

And as we mentioned last time, Coach Schexnayder is one of the world's foremost authorities in track and field, and his accomplishments are many -- coaching world champions, silver medalists, Olympians, NCAA champions, Team National titles, many, many SEC champions and SEC titles, and many LSU records.

He also has a passion and a commitment to education, chairing the USATF Coaching Education committee as well as helping design and create the curriculum for the educational branch of USTFCCCA.

And we are so thankful to have you back online with us. Thanks so much for joining us again, Coach Boo.

Boo Schexnayder: Happy to be here. Thank you.

(Greg Huffaker): What we're hoping today to maybe discuss with you some of your thoughts and the knowledge that you've learned over the years on training for acceleration and max velocity.

We obviously got to dive into some 400-meter training, and speed endurance. But you know, no matter how fit you are, you're going to have to learn how to accelerate and increase your max velocity. And so we thought if you wouldn't mind sharing some of the knowledge that you've gained over the years on these topics?

Boo Schexnayder: Looking forward to it.

(Greg Huffaker): Good. Well, a book that I read that I enjoy a lot, Good to Great, I don't know if you've read about it. It talks about the importance of getting the right people on the bus and the wrong people off.

And one of the things I thought that we could, maybe, help with Coach, is to get some of the wrong training out of their program. With acceleration training and mass velocity, are there some big don'ts that you've identified that might be things that you see, unfortunately, in some training programs?

Boo Schexnayder: Well, I would think that all the big don'ts fall into one category, meaning that they're totally nonspecific. I mean, when you're training and trying to become faster, or more explosive, it's a very simpler process.

To become faster and to become more explosive, you have to train with high velocities and explosive movements. So almost all of the mistakes fall into the category of not being explosive or not being fast.

So in short, you know, we already know how to run slow. You really don't have to practice that. And most of those problems and improper training, fall into the category of velocities that are too slow, or intensities that are too slow, or an overemphasis on endurance training, or strength training that's not really proper, or along those lines.

So in short, you know, just an absence of intensity in the training program, is typically, by far, the most common mistake of all. And all of the other mistakes are typically offshoots of that big one.

(Greg Huffaker): Awesome. Thank you. So another question that we had from some people that were wondering about things -- and you talked about some strength work -- as you're building towards acceleration and max velocity, what does a strength program - you know, what are some big concepts that people should be thinking about to help complement that type of training?

Boo Schexnayder: Well, if you're trying to devise a strength training program for - to complement the acquisition of speed and acceleration capabilities, there are several subcomponents. Obviously, overcoming inertia is a big one. So even though it is not the main thing you do, some minor emphasis on squats and those types of exercises are important because of that. The ability to overcome inertia and to anchor the points of our body's lever system, that's, kind of, a function of the slower forms of strength.

The Olympic lifting program, things like snatches, and cleans are great power development tools and have a lot to do with our ability to accelerate effectively from the 10-meter point on out to maximum velocity. And then there's a lot of other things as well.

The plyometric program is part of the strength training program. And the plyometric program is, not only, about explosive strength, but it's also very specific technical practice for applying forces to the ground in the correct planes and with efficiency.

And then things like medicine ball training for core development, or using the medicine ball, or general strength training, for restoration, and body balance, and coordination development. That's all part of it as well.

So in short, you know, it's very difficult to keep strength training, form, speed, simple, because the best strength training, by definition, is very diverse. So bodyweight circuits, and med ball, and slow lifts, and fast lifts, all of those things, plyometrics, all need to be part of that program if you're going to maximize your results.

(Greg Huffaker): Thank you. And if people have not listened, I encourage you to try to listen some because we've talked about especially some restorative strength training and how that can really accelerate the recovery that an athlete can see between sessions.

Plyometrics, that's something that we didn't get into much about 400-meter training. And you mentioned its importance for acceleration work. How many times a week would you recommend doing some plyo work and when would they do it in relation to when they're doing their running workouts?

Boo Schexnayder: Typically, I try to do some type of plyometric component, even if it's a small one, on every single speed day - not every running day, but every speed day. So just about any time after an acceleration workout, or a resisted acceleration workout, or a maximum velocity workout, in my program, you can pretty much be sure that you're going to do some type of plyometric work.

On acceleration days, most of the time, not always, but most of the time, I like to emphasize horizontal movements because the acceleration is, in nature, horizontal pushing. And it serves as a good technical enhancement tool for the acceleration capabilities.

And on max velocity days, I tend to keep things a little more vertically oriented for the same reason. It's a little more comparable as to the way we apply forces to the ground during max velocity.

(Greg Huffaker): How much plyometric work is too much?

Boo Schexnayder: Oh, that's a loaded question. It changes a lot at different times of the year. Typically, you start the year doing moderate volumes of lower intensity things. And you progress to low volumes of higher intensity things over the course of time.

You know, if you're doing, like, a simple in place jump circuit, about 300 contacts is pretty typical for most levels. If you're doing short bounding sessions, you know, maybe 100 to 120 contacts is, like, a really big session. But if you're doing, like, pretty intense box jumps, or something like that, like, 30 contacts might be a lot.

And then, of course, you have the athlete's age, the athlete's ability level, and all these other things that come into play as well. So that's about a six-hour answer. And that's the…

(Greg Huffaker): Yes. Yes.

Boo Schexnayder: …sixty-second version.

(Greg Huffaker): Yes. No, and that's great. I mean, that can give people some rough guidelines and some ideas. Maybe, if you wouldn't mind, sharing a couple of your favorite plyometric exercises on an acceleration day, and a couple of your favorite exercises to do on a max velocity day?

Boo Schexnayder: Yes, sure. When I do acceleration development stuff, I - most cases I like to do horizontal things. So I'll do things like, standing long jumps, or I'll do three double-leg bounds in a row, maybe a standing triple jump or really, something simple, like a right, right, left, left where you're landing in the sand after four contacts.

I typically, don't go past about four total - four or five total takeoffs. But again, they're all horizontally oriented. And that enhances the horizontal force application. So those are pretty typical ones and probably the ones I use the most.

Normally, on a max velocity day, I'm doing simple little box rebounds that are a little more vertically oriented or possible hurdle hops. You know, just repeated double-leg hops over successive hurdles that are predominately vertical in alignment.

Some days, I'll also do real simple vertical bounds -- little baby, kind of, bounds that are very simple and vertically oriented. They're kind of conservative. They're not as high as you can go or as far as you can go. They're kind of like pogo sticks with the - pogo jumps, I guess you could say, done in a single leg kind of format. I'll do those on max velocity days as well.

(Greg Huffaker): Okay. And so again, we would do these after the completion of our running workout, correct?

Boo Schexnayder: Correct.

(Greg Huffaker): And how much type of recovery between, maybe, a set of, you know, horizontal or vertical plyometrics would you do?

Boo Schexnayder: Whatever you need. You know, typically, the type of exercise is going to dictate that. And they have to be explosive, which means you need a little bit of rest, but they're not overly fatiguing either when done. You know, if I put three boxes together and have an athlete bound on and off those boxes, they're not going to be really winded.

So I guess, the best way to describe the recoveries is not overly scientific or measured, but working at a leisurely pace, I guess, is what I should say. You don't want to work at a pace that's so fast that you accumulate fatigue during the course of the plyometric workout.

(Greg Huffaker): Yes.

Boo Schexnayder: Yes. I don't think many people are really formal with a stopwatch out there timing the recoveries.

(Greg Huffaker): Yes. And so now, we've just talked a little bit about how some of these complementary plyometric exercises would differ in acceleration versus max velocity. Would you ever mix these two elements in the same workout?

Boo Schexnayder: Max velocity and acceleration, would I mix them?

(Greg Huffaker): Yes.

Boo Schexnayder: Is that the question?

(Greg Huffaker): Yes, that's the question.

Boo Schexnayder: Yes. Sometimes you're, kind of, cramped for time and there are certain phases of training where you want to address both, and you really don't have an extra day. For example, when you have a kid, maybe, who hurdles, but also you want to do acceleration development, and max velocity with them and you only have the luxury of being able to do two speed days in a week. Well, one of those days has to be the hurdle day, so what you're doing, is you're looking for a way to combine acceleration and speed development on another day.

So that's a practical situation that comes up quite a bit, and to answer your question, yes, I do combine them. The favorite way - my favorite workout for combining acceleration and speed development is, I'll do acceleration and speed mixed into sets.

So for example, what I'll do is, I'll do, for example, at the high school level, I'll do, like, a 20-meter block start, and do a second 20-meter block start. And then, I'll have them do, like, an 80-meter sprint-flow-sprint type of speed development, max velocity effort. And that would be a set.

And then over the course of the workout, we would do three or four sets of that. If you do all the block starts first, then you're typically, a little too fatigued toward the end. It doesn't work nearly as well. If you do all the max velocity stuff, then you accumulate fatigue too quickly.

But by alternating those pairs of 20-meter block starts, with the - in-between the sprint-flow-sprint efforts it works out really nicely where they get just the recovery they need, and you can get a lot of quality work done really quickly without overly fatiguing the athletes. So that 20-20-80, or maybe for better athletes, maybe a 20-20-90 done with three or four sets is a really good option there.

(Greg Huffaker): And so could you give us a little idea of how that sprint-flow-sprint would work as they're doing, you know, 80 to 90 meters of that. How would they break that up? And what's the goal of the sprint-flow-sprint?

Boo Schexnayder: Well, any time you're trying to develop a maximal velocity, what you want to do is you want to bring an athlete to max velocity and keep them there for a very short period of time, a period of time less than three seconds.

Humans are typically capable of holding max velocity for about three seconds, and then we start to see deterioration of speed, and we don't want to have any deterioration of speed in our workouts. So, therefore, what we do is we bring them to max velocity. And we keep them there for periods of time less than three seconds, you know.

A lot of coaches like to do distances like 60s for speed development. Well, the philosophy behind that is that most athletes at the high school level who are decent athletes are going to hit max velocity around the 40-meter mark. Which means, from 40 to 60, they're as fast as they can possibly be, and that's typically, going to be about two seconds for most of the athletes we're working with. So that's why that's a good construct.

Now, getting back to your original question, my personal favorite way to do max velocity is with sprint-flow-sprint constructs. And in case your listeners aren't familiar with the term sprint-flow-sprint, it's what some coaches call hollow sprints.

Basically, within the context of one effort, you sprint maximally, then you relax slightly, a relaxed sprint, and then you resume maximal sprinting all within the context of one effort, typically, anywhere from 80 to 90 meters or so in length.

And I think that this is a more complicated arrangement, which makes it a better arrangement from the standpoint of challenging the athletes from a mechanical standpoint. So, I prefer it to the simple 60s and those types of runs. I think you get more out of it.

What I'll typically do -- let's assume you're dealing with an average athlete -- you know, pretty decent high school sprinter. That kid will probably hit their max velocity, say, let's say around the 40-meter mark. Well, what I'll do is I'll put my cones out around maybe 50 meters, around 70 meters, and around 90 meters.

So thinking back again, where our athlete hits max velocity at the 40-meter mark, in this case, from 40 to 50, that sprinter or that athlete is as fast as possible - as fast as she can possibly be there. And then from 50 to 70, there's a little bit of a relaxation there, and then from 70 to 90, you're blasting again. And that takes about two seconds.

So, what we have within the context of one run, is we have an initial, approximately one-second window of max velocity, and then later, we have a two-second window of max velocity. So we're able to achieve two windows of max velocity within the context of one run. It's very efficient time-wise, and it's a little more complicated in the motor education sense, and therefore, it's a little more effective as far as a teaching construct is concerned.

So hopefully, that was clear. I think it's important to understand also, that different athletes of different levels are going to hit max velocity at different points.

If you have a very developmental person, it's quite possible they'll hit max velocity at say 30 meters. You know? And if that's the case, well, you're going to have to kick the cones back toward the starting line a little bit in order to keep those zones appropriate.

If you have a super-stud athlete, you know, they might hit max velocity around 50, 55 meters. If that's the case, well then, you'll have to kick the cones down the track a little bit, and instead of running 90s, you might find yourself running 100-meter sprint-flow-sprints.

So, you have to be prepared to deal with different athletes of different levels. And what you really need to know is a general idea. It doesn't have to be perfect, but a general idea of where that kid's going to hit max velocity and understand that in a sprint-flow-sprint construct, you're looking for about a 1 to 1.5-second window and then about a 2-second window in the second sprint construct.

If you keep those three things in mind, you can coach athletes of any level and do a good job as far as maximal velocity development with them.

(Greg Huffaker): Awesome. That was so helpful. And I think you described how that should work very well.

As you get a more seasoned athlete, do you have them do a sprint-flow-sprint more based on feel? Or do you still like to have some visual markers for them to help them with that workout?

Boo Schexnayder: My best ones that have been with me for years they pretty much work on feel.

(Greg Huffaker): Yes

Boo Schexnayder: Meaning that I don't really - I no longer really have to put the cones out for them anymore. They know when they feel when they've hit max velocity, and they'll keep it there. Then they'll throttle it down and pick it up for a couple of seconds.

And we just talk about, you know, the lengths of the windows, you know, one second, two-second window lengths. And they don't really need the cones. But there's nothing wrong with having the cones out there. And when I move them into other zones, or do other things, like, speed endurance work with them, then the cones come out again until they prove to me that they can master it and they have a good feel for it.

(Greg Huffaker): Yes. Awesome. So I guess, you know, as I'm looking over some of these notes and something maybe I should have asked you earlier, but when a coach is looking at an athlete, you know, and looking, what should they be looking for from an athlete when they're sprinting from 0 to 40 or 50 meters, you know, 40 or 50 meters to 60, 80 meters, and on to the finish for 10 meters.

What are some key points a coach may want to look for in their athletes, you know, as they're helping guide them towards speed acquisition, you know, acceleration, and max velocity?

Boo Schexnayder: You mean mechanics?

(Greg Huffaker): Yes.

Boo Schexnayder: I hope you realize, I teach, like, three-day courses on this, so that's hard to squeeze all that stuff in, but I'll try to…

(Greg Huffaker): You know, I…

Boo Schexnayder: …hit the things that are most important here. Yes.

(Greg Huffaker): …grew up in the Cliff Notes, you know, generation. Kids listening now will have no idea what Cliff Notes are, but give us…

Boo Schexnayder: Yes, I they got a lot of us through…

(Greg Huffaker): …the Cliff Notes version.

Boo Schexnayder: Yes, they got a lot of us through college but anyhow.

During acceleration - well, first of all, I don't think you can separate the start from acceleration, but the things I'm looking for you know, in the start, are proper displacement, meaning are we moving the body as a unit, and the proper trajectory. You know, you don't want to be vertical, but you surely don't want to be purely horizontal. Are you hitting the correct angles in your start?

So that's number one. During the acceleration phase, you know, from 0 to 40, 0, to 50, depending on the level of your athlete, I look for a few things. First of all, is I look for a general progression of body angles. We all know that when we come out of the blocks, there's a body lean. And at the end of their acceleration phase, there's no longer a body lean. So, I look for a smooth progression of those body angles from a marked forward lean to an upright position.

Also, at the same time, I look for a progression of the shin angles. When I say shin angles, I mean the angle of the shin at the time it - the foot touches the ground. Our bodies are hardwired to apply force through a pre-aligned shin. So the shin angles - or the angle of the shin as the foot touches the ground always, always dictates and shows the coach the angle at, which forces are being applied.

So just like we should see the body angles progress from a forward lean to an upright position, we should also see the shin angles progress from a forward lean to an upright position. And at any time in the acceleration process, the shin angle and the torso angle should always match. They should always be similar to each other.

It's a - you'll see in dysfunctional accelerations, you'll typically see the chest rise sooner than the shin angles do. And that results in really poor sprinting postures.

And the third thing that I'm looking for always is the achievement of a neutral pelvis at the completion of the acceleration phase. You know, if you could tie a camera onto your belt buckle, obviously the first couple of steps of sprinting, you would be taking a picture of the ground a little bit ahead of you. But as we progress, and move through the acceleration phase, at the completion of the acceleration phase, the pelvis should be neutral, and that camera should be directed straight down the track.

You know, sometimes you'll see athletes who'll get to achieve max velocity, and toward the end of the acceleration phase, you'll see the chest is up, and you'll see the heads up, but the butt's kind of stuck out and you see a curved lower back and a lot of backache. And that's because those two angles that I mentioned earlier, the hip angle -- I'm sorry -- the body angle and the shin angles didn't stay together and intact for the duration of the acceleration phase.

So in short, those are the architectural things. Those are the things that I look at as far as landmarks are concerned. There’re other parts of it too, like full ranges of motion, making sure that we're always nice and open between the thighs, you know, big split between the thighs on each stride. A patient frequency development, not a rushed frequency development, but a patient frequency development is important as well. So those are the more elastic and more rhythmic factors associated with the acceleration as well.

So in short, I guess, those are the five key things that I probably spend 95% of my time coaching.

(Greg Huffaker): Now…

Boo Schexnayder: And just about any serious dysfunction in acceleration phase is going to show itself in one of those areas, or maybe more than one.

Now once they achieve max velocity, the things I look for during max velocity from the achievement of top-end speed on until the remainder of the race, they don't really change. And this is a lot simpler. At the end of the acceleration phase, we should see upright body postures, and the pushing against the ground is predominately vertical, not horizontal, but vertical. Which means that the shin angles are going to be vertical.

So what I do is pretty simple. I just try to make sure that throughout the max velocity phase that we see the mechanics present at the end of the acceleration phase continued, that we do not see any changes. We continue to see vertical postures. We continue to see neutral pelvis. We continue to see vertical pushing and shin angles. We continue to see split between the thighs, openness. And we continue to see frequencies that are high, but not rushed at any point and time.

(Greg Huffaker): Fantastic. Thank you so much, coach.

Boo Schexnayder: I hope I've cleared - it's hard to, you know, picture ((inaudible)) with words here, but I'm doing my best to paint…

(Greg Huffaker): No.

Boo Schexnayder: …words. I hope I was efficient…

(Greg Huffaker): Yes. It…

Boo Schexnayder: …for your…

(Greg Huffaker): …it's great.

Boo Schexnayder: …listeners.

(Greg Huffaker): And like you said there, "You can teach a three-day class on this." And we're talking some about, you know, acceleration and max velocity and so I thought maybe you could give some people some big, broad concepts of things that they may want to look for you know, as they're doing some of things. That may help them a little bit also if that makes sense.

Boo Schexnayder: Good. Well, hopefully, I have. And by far, I think that those are the most important ones.

(Greg Huffaker): Yes. So getting back a little bit towards the training side of things. If we're doing the acceleration training, how many meters are we looking for in a session? If we're doing max velocity, how many meters, you know, could we think about in a session for those things?

Boo Schexnayder: My acceleration sessions, I'm being broad here, but they typically, range between 200 and 400 meters. And most of the time I'm hovering in the 300 meter or so range. I think that you're kind of wasting your time if you don't do at least 200 meters and you're probably not accomplishing much once you get past 400.

And by the way that's also true for like, resisted accelerations as well. Max velocity, I'm typically, ranging between 400 and 550 meters. And I always - I'm really looking for quality there. So you'd probably be surprised how more often I hang toward the shorter side versus the longer side.

(Greg Huffaker): Awesome. You touched on the importance of the specificity of training and speed acquisition. But maybe give people an idea, you know, why we don't need to practice running slow, because that's easy, but just like, careful of endurance training for a sprinter -- what they may need to -- why they may need to look out for that other than just not having to practice running slow.

Boo Schexnayder: Well, there's many things. And a lot of it lies in biochemistry. You know, when we subject athletes to really high aerobic loads, I didn't say anaerobic, I said, aerobic loads, which is what we see in a lot of programs, where there's an overemphasis on the aerobic side of things, when we see that, our bodies adapt in ways, not in ways to make us faster, but adapt in ways to make us more economical.

And slow-twitch fibers are far more economical than fast twitch fibers. So what we actually start to see, is we actually start to see small shifts of faster twitch fibers to slower types. We see changes in the enzymes associated with muscle contraction, and we see site changes in the myosin-actin form.

So I guess what I'm saying is, overemphasis on endurance training, particularly slow-endurance training, will actually kill a fast twitch fiber and make it slower. And that's - research is completely undeniable. So that's probably the single biggest danger.

The other thing is that an overemphasis on endurance training will often affect running mechanics negatively. You know, when you do that really tough running workout, and your kids leave the track that day, if you watch them, you know, they're typically not walking very tall. You know, they're typically, bent over and walking, kind of, in a decrepit fashion, you know, because they've got tight hamstrings, and tight hip flexors and all of this kind of baggage comes along with those running workouts.

I understand that's part of track. But if you do those workouts too often, or too repeatedly, well, these things start to become semi-permanent. Next thing you know, is you've got somebody who's got really poor running mechanics, and typically, you've lit the fuse on a lot of injuries that are associated with repetitive movement as well.

So an overemphasis on endurance training, particularly at the - at slower velocities, is often a huge indirect production factor as well.

So in addition to the nonspecificity, those are probably the two biggest things for just building a body that's not built to be fast. And that's why I always say, you know, if you're going to do endurance training with a sprinter, it's got to have a purpose in mind. You know, maybe down the road at some point in time, you're going to do some speed endurance. And make sure that your program - your running program is designed to prepare them for that. And if it's preparing them for something else, well, then, you don't need to be doing it.

(Greg Huffaker): Awesome, thanks. You mentioned resisted running. How does that tie in and how do you use that to help with acceleration and max velocity training?

Boo Schexnayder: Well, it's a huge part of what I do. And I think it should be a big part of everyone's program, to be frank with you. Resisted sprinting, or resisted accelerations, are one of the best things you can do for simple explosive power development. But there are other things as well. They also serve two other purposes that we don't often think of. When you're, you know, with keeping in mind, when resistances are moderate or modest, typically, our running mechanics actually get better.

A lot of coaches are afraid of them because they're afraid to harm running mechanics, but I've typically found that when you apply light resistance to someone, typically, the mechanics actually get better. They have a better sense of push, a better sense of force application, provided that they're patient, and they show good ranges of motion.

A lot of times, I've seen kids who sprint like garbage and they sprint beautifully as soon as just apply a light sled to them or something like that. And sometimes that's a pretty good teaching tool. You know It's a good way to - it shows you what they're capable of doing from a mechanical standpoint.

And another thing is that the resisted sprinting is a very good teaching tool from the standpoint of the way that it contrasts training. You know, if we'd look at - if we'd delve into the science of motor learning, we - motor learning tells us that the way to teach a skill is not necessarily to isolate an exact version of a skill but to rehearse subtle variations of the skill.

And we do this in track all the time. You know, you're - when you're working with athletes, you do block starts, you do three-point spares, you do two-point starts. Those are all subtle variations of the same skill, and they make us better in starting, just for starting sake.

Well, it's, kind of, the same thing with acceleration. You know, The acceleration model is actually improved because of the correct usages of resisted running within the context of the program.

Now, at this point in time, you know, there's kind of a - I'm not going to call it a fad. Maybe it's a trend, but heavy sleds are all the rage in a lot of training programs. And heavy sleds are good for strength, and they, kind of, fall into the category of weight lifting, and I'm not going to say that they're bad.

But heavy sleds do not perform this educational component. They don't provide this subtle contrast. So this is why I try to keep my loading light and make my resisted running subtle - subtly different in velocities when compared to the non-resisted accelerations that I do.

Heavy sleds, I think fall into the category of strength training, and you know, I think if you've got a good weight training program, it's probably not necessary. But in any case.

So that's where I think the resisted running comes in . You know, I try not to slow an athlete ever down more than about 15% of what they're performance would be - what they're time performance would be for any given distance non-resisted.

(Greg Huffaker): Okay. So about 15% is what they're looking at?

Boo Schexnayder: At the moment.

(Greg Huffaker): And about how many meters in a session would you run with resisted running?

Boo Schexnayder: About the same as any acceleration development session. You know…

(Greg Huffaker): Okay.

Boo Schexnayder: …range in…

(Greg Huffaker): And…

Boo Schexnayder: …probably about …

(Crosstalk)

Boo Schexnayder: I'm sorry.

(Greg Huffaker): No, I'm sorry, go ahead, coach.

Boo Schexnayder: No, I just said, "Up to 400 at the max."

(Greg Huffaker): Okay. Yes. And is this something you try to incorporate weekly - more than once a week?

Boo Schexnayder: During my early preseason, I try to work it at 50/50, resisted sprinting and non-resisted. I should -- let me rephrase that -- resisted acceleration and non-resisted acceleration. I try to work them at about a 50/50 ratio. Typically, in specific prep, a little later, I get away from it. And then, in season, I'll come back and touch it periodically. You know, it might be in the workout one week. It might be gone for two weeks, pop back up the next week. It's something that I, kind of, hit every so often, kind of depending upon how I feel about the athlete's mechanics and so forth.

You know, the sled does one other thing. The sled enables you to go all out, maximal intensity, maximal power output, without going at maximal velocity. So the sled is also a great safety tool. Because you can sprint athletes really hard with the sled. You can get a lot of hard work done with the sled that's near max velocity, but the sled itself actually slow athletes down just enough where it's actually safer than sprinting so when you have an athlete maybe who has a little bit of a hamstring issue or something like that, sometimes the sled's a good tool for that. You know, it'll enable an athlete to sprint with really high intensities without high velocities, if that makes any sense.

That's why…

(Greg Huffaker): Yes. No, that makes sense.

Boo Schexnayder: Yes, that's why the sled's a great rehab tool as well. You know?

(Greg Huffaker): Yes. So if we look at, you know, a high school coach that may not get to work specifically with an athlete in the fall, and they start in the winter with an athlete, would you - and they do compete some during the indoor seasons, do you think resisted running is something that they could still continue to use even though there, kind of, will hit their competition season, maybe a little sooner than some of the athletes that you get to work with?

Boo Schexnayder: Sure. Absolutely. I've had many athletes at every level who've done a, you know, who've done a resisted sprint sessions, again, with subtle resistances, in season with no problem at all. You know, just make sure that you periodize it properly.

A lot of times, I'll try to do a little bit of resisted acceleration on a typical - on a Monday. And, you know, if you had a really tough meet on the weekend, that's a great thing to do on Monday, because again, it lets you go all out with still an element of safety because the angular velocities of the joints are reduced somewhat.

So there, there's no problem at all with doing that in season, or even if you have a short pre-season, or whatever. It doesn't matter. It doesn't hurt a thing. Just keep in mind that at some point in time, you've got to sprint without a sled.

(Greg Huffaker): Yes.

Boo Schexnayder: As long as we understand that it doesn't take the place of the sprinting we need to do, particularly for max velocity training. But it's a great power development tool. Great to enhance acceleration development and a lot of other things.

(Greg Huffaker): And there's several different devices out there that people can do resisted running in. And you've mentioned the sled. Is that your favorite way to add resistance for acceleration training?

Boo Schexnayder: Yes. I really like the sled. Because they're a nice. They're smooth. They're easy trips. They're hard to break. You know, and you can - I mean, you can create them almost. I mean, I know the ones you buy are expensive, but you can get them made really cheap. I mean, because they're very simple.

And they're typically, approximately the correct weight for most levels of athletes. I know they put a little spike on there that enables you to put more weight on them, but typically, most of the sleds alone are perfectly fine.

Frankly, when I was a high school coach, and in my first tenure at LSU, I never used the sled. I always had automobile tires that we tied ropes onto and dragged them in the grass. You know? So…

(Greg Huffaker): Yes.

Boo Schexnayder: …you don't have to be high-tech and fancy and all that type of stuff at all. So these things, you know, are pretty - they work perfectly fine. Just make sure that the rope is nice and tight before you sprint, because, you know, other than that, you know, they're perfect to work with.

(Greg Huffaker): Yes.

Boo Schexnayder: I'm not a fan of some resistance devices. Some of them, because they're just too heavy.

(Greg Huffaker): Okay.

Boo Schexnayder: And if you really don't follow that role, the rubber bands really, typically, don't give you a very even resistance at all. And then the parachutes don't work that well either, with all due respect, because first of all, you don't get any resistance for the first couple of steps, until the parachute fills with air.

(Greg Huffaker): Right.

Boo Schexnayder: And then, after that, it works fine, provided that the wind isn't a cross-wind or anything like that. You know, I've seen bad effects with parachutes when the winds were unpredictable and so forth. The parachutes are not bad if you're able to go indoors.

So in short, you know, I think, frankly, the simpler, the better. And sleds are about as simple as it gets. And then, if you don't that, or if you're, you know, if you've got problems with snow, or whatever, you know, there's nothing wrong with getting on a stadium steps or the steps in your schools hallway, or whatever you've got, you know, any of that. It's not perfect, but if you can get something done there, you know?

(Greg Huffaker): Yes. If a coach's is maybe looking to use a hill, is that something that can work? I know they need to be really careful about the percent grade because you're looking for a lot more modest type of grade in that situation.

Boo Schexnayder: Correct.

(Greg Huffaker): But is that another approach as well?

Boo Schexnayder: Yes, correct. But that will work fine as well. You know.

(Greg Huffaker): Yes.

Boo Schexnayder: The disadvantage of a hill is that if you're running up a hill, you're going to lean forward the entire time. Whereas in a sprint, you're actually going to progress body angles from a forward lean to upright. That's the advantage of the sled. If you tie the sled onto your waist, you can progress the body angles the way you would naturally when you're sprinting.

So there's a technical advantage to it, but as far as the power development, or as far as developing acceleration capabilities, a hill is just as good, or a stadium is just good.

(Greg Huffaker): Awesome. I appreciate your practical approach to training, knowing that not everyone has a resource to buy sleds or has different resources and weather challenges around them. That's awesome.

Boo Schexnayder: Yes, when I was - back, you know, all the years I coached, I had a pickup truck and any time I found an old tire in a ditch I stopped, threw it in the truck, and somebody dragged it on Friday.

(Greg Huffaker): That's awesome. So Coach Anderson was hoping that maybe we could talk about blocks a little bit. And the start to wrap it up, we want to be mindful of your time. We are very thankful for what you're willing to give.

What are some of the most common mistakes coaches make with block starts?

Boo Schexnayder: I'll put them into two categories. One is - and the most common, I think, are trajectories out of the blocks that are too flat. You know, in sprint culture, we always hear kids say, "I popped up out of the blocks." But when I go to track meets, I just don't see it. When I go to track meets, I see far more athletes who push at too low of an angle, and as a result, they're too forward, and they'll sidestep, or they'll stumble, and they just have real difficulties achieving good postures later in the sprint because of the fact that they just pushed out too doggone low.

So ultra-low trajectories, to me, is probably the single most common one. And a whole, oh, my gosh, dozens of starting faults and acceleration faults can be directly linked simply to that.

And then, as a coaching culture, we spend all our time talking to kids about staying low in the first few steps, which isn't correct. And that just exacerbates that, you know, to be honest with you, you know. That's one of the biggest misunderstandings about sprinting in general, is that we always say, "Oh, you've got to stay low, stay low."

No, you don't. You start low, and then you rise. You know, every step should show a progression, a vertical progression and a more upright posture than the step before it and that's what we're trying to achieve. And that's not been a part of sprint training culture for years and years.

So the low trajectories are definitely a big one. And the other one, are just half-hazard approaches to block spacings and block settings, you know. I mean, I'm a guy, you just put your blocks at two feet and three feet and get your butt up in the air, and just roll with it. You know?

The hip height and the block spacings are really all there are to it. It's not a lot to it, and most of the time, when we see problems with block starts, we automatically assume that the block spacing adjustments and doing crazy things with those is going to make some type of solution when actually it's a movement mistake. You know, it's about technique and doing things correctly.

So the whole idea that any time there's a starting problem, we adjust the pads, that's a mistake. That's an error. We don't adjust the pads. We adjust the athlete.

(Greg Huffaker): Yes. And as they come out of that block, where - what kind of angle should they be shooting for as they're coming out of the blocks?

Boo Schexnayder: Well, it varies depending - it's going to be about 45 degrees. But it varies to some degree depending on the level of the athlete that you're working with. Keep in mind that when you're in the air when you're sprinting, that's not wasted time. This is when you're completing the knee drive. This is when you're turning the quad on. This is when you're preparing the leg for impact and so forth. So there are things that happen. So there needs to be a certain amount of air time between the steps in sprinting.

All right? If you don't want to spend a lot of time on the ground, you've got to be somewhere, and that time is in the air. So the air time does have value within reason of course. So if you're a very talented athlete, you can push out at a very low angle, and still, get air time. But if you're not a talented athlete, or if you're developmental, to get airtime, you have to push up at a higher angle.

So I would say that an elite level sprinter, might be pushing out at say, a 35 degrees or so. Whereas a developmental sprinter, to sprint properly, might have to push out at say 50 degrees or so. So if you're going to ask me for a number, I'm going to say about 45, but again, the trajectory really has to match the level of the athlete.

You know, if you've got a great throwing arm, you can throw a baseball a long way on a line drive. But if your arm is weak, you better put it up in the air if you want to get it some distance. And it's, kind of, the same thing with our bodies as we drive from the blocks.

So what is a good trajectory for one athlete, you know, the senior you have on your team who's going to win State, is probably not going to be a good trajectory for a developmental young man, or young lady, who is just brand new to sprinting and has never really trained yet.

(Greg Huffaker): Awesome. That's fantastic.

My arm was such that they liked me to use it to get water for the other baseball players.

And so after that initial angle, what are we looking at for that next step? Are we looking for - your first step, a short quick one, or should it be a little longer as they're looking for that first step?

Boo Schexnayder: Well, you never want a short quick step in anything, so I'm going to say no to that. I mean, I'm having a hard time visualizing exactly what you are, but remember, the most important thing we do in sprinting from a mechanical standpoint, is to achieve range of motion at the hip.

So you - so rather than looking at what you're accomplishing from the standpoint of where you're feet are touching, look at what the thighs are doing. And look to make sure that, not only is the knee coming up but is the back thigh pushing through a full range of motion? Looking for that angle between the thighs, achieving an angle of anywhere of 120 up to say, 150 degrees or so that's what you're really after. That's what's more important than anything else in that regard.

So I'm going to say that it's going to be a little bit more of a patient type of thing because we mentioned the patience of stride frequency development. And we're emphasizing range of motion. And any time you think quick and short, that's always the enemy of patience and range of motion.

(Greg Huffaker): I think that you know, as a distance guy, you know, you think about, you know, quick, quick, quick, quick, quick. And that there is like you've talked about, there's a patience to making sure that you sequence the start, and the acceleration, and you know, your angles, and all those things correctly to maximize, you know, your ability to build speed, to you know, do all those things. And that sometimes, it seems like some younger or inexperienced coaches or athletes, they just want to rush through it.

Boo Schexnayder: Yes.

(Greg Huffaker): With starts, with acceleration development, with training. And people lose the big picture and the process that not only just is training, but that it's a race too. And even with sprinting, that it's a process that requires some patience to learn correctly and execute correctly.

Boo Schexnayder: Yes.

(Greg Huffaker): That it's not all just go, go, go, go, go, go.

Boo Schexnayder: Well, remember, the person who moved their legs fastest, doesn't win. The person who applies the most force throughout the course of the race wins. And if you think of it that way, it becomes - it makes - starts to make a lot more sense. Remember, and I think I'd like your listeners to remember that, moving your feet fast, and moving your limbs fast is not speed. It only becomes speed if you move your limbs fast through complete full ranges of motion and if you sacrifice the range of motion at any time in a sprint, you're slower, and it doesn't matter how fast you feel.

Now, the athletes that we work with day to day, they typically don't understand that. And they typically, perceive speed as how fast my arms are moving and how fast my stride frequency is, what my stride cadence is. And nothing could be further than the truth.

Again, only when these things are expressed through full ranges of motion do these actually result in genuine speed.

(Greg Huffaker): That's awesome.

Well, if you don't mind one more question, Coach Anderson wanted me to ask you if you are a fan of overspeed training?

Boo Schexnayder: I wouldn't - I'm not a huge fan. I think that a lot of the roots of overspeed training are misunderstood. You know, if we take a look at what actually produces high frequencies in a race, it's not you trying to move your feet faster. It's the elastic loading and the end of the range of motion. For example, if you drive your knee up, you stretch your hip extensors, and then those, that stretch on those hip extensors produces a more forceful downstroke.

What if I drive my knee harder? Then there's going to be a greater pre-stretch, and I'll apply more force on the downstroke. So the harder I push, the greater the elastic loading is at the end of the range of motion, and that increases the speed at, which my limbs move.

So that's how we actually produce frequency, with bigger forces and by pushing harder. A lot of the pretenses around overspeed training are based on the fact that high-speed, high-frequencies are based upon the ability to move our feet quickly, or the ability to move our legs quickly. And I just said that I, kind of, disagree with that.

Now, that being said, a subtle overspeed training methods have been shown to be effective. And I've been around them. And I've used them a little bit and been - and I've seen some effectiveness there. I just think the reason why they're effective is misunderstood.

So in short, I'm not going to poo-poo the idea of overspeed at all. But I do think that we need to look at it from a little bit more of a scientific viewpoint, understand exactly what we're trying to achieve, and have an appreciation for how subtle the assistance is in good overspeed training.

Like, what a lot of people think is overspeed is not overspeed at all. You know, I’ve been at programs where they do towing, or pull athletes through speed gates, and when we actually measure, we find out they're being towed, and they're actually at about 94% to 95% of their max velocities.

So what they're calling overspeed training is not overspeed at all. It's under speed. So in short, very subtle overspeed has the potential for success, whether it's downhill, you know, it's got to be like, very, very subtle. My favorite overspeed training tool is simply finding out, which way the wind's blowing and running in that direction. And every time I do a speed development session, I try to orient it with the wind.

So I'd be lying to you if I told you I never did overspeed, because, you know, I'm always conscious about wind direction, there. But I don't think you need a whole lot of gadgets. And I think the more complicated the gadget, typically, the least effective it is.

(Greg Huffaker): Awesome. Coach, thank you so much for your time, for sharing your knowledge, and in your experience, I again, appreciate your practicality to the approach. And just your willingness to share your experience and wisdom and knowledge.

Boo Schexnayder: My pleasure. Thank you very much. I appreciate the opportunity.

(Greg Huffaker): Thanks Coach Boo. Talk to you soon.

Boo Schexnayder: Okay. Thank you.

(Greg Huffaker): Thank you. Have a great night.

Boo Schexnayder: Thank you as well.

(Greg Huffaker): Have a great one, Coach. Thanks again. You're awesome.