

Patrick Ward, MS CSCS LMT

Sports Performance Coach and Licensed Massage Therapist



Interview With Seattle Sounders Athletic Development Coach Dave Tenney

by Patrick on September 1, 2010

Today I have a really great interview with Seattle Sounders Athletic Development Coach Dave Tenney.

I have had the pleasure of corresponding with Dave through Mike Boyle's strengthcoach.com and have found Dave to be an excellent resource for training information. He brings a very well rounded approach to Strength and Conditioning, two terms that probably don't justify what he does as a coach, as his programs are highly specific and take into account the importance of individuality with each athlete.

In this interview we covered topics like:

- **Dave's philosophy on training soccer athletes**
- **The importance of aerobic work for soccer players and understanding the specific alactic/aerobic needs of these athletes**
- **Issues with relying solely on high-intensity interval training in your program**
- **Use of the Omega Wave to objectify recovery following competition**
- **Ideas on recovery strategies for the athletes**

The interview is a little long, but the content is very rich and I am excited to present it to you.

Hope you enjoy it!

Patrick

patrick@optimumsportsperformance.com

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1) Dave, thanks for taking time out of your busy schedule to do this interview. Can you briefly give the readers a little bit of background on yourself, as well as your overall philosophy for preparing soccer athletes?

I came into the profession of fitness (strength & conditioning, or whatever you want to call our profession today) after both playing and coaching soccer, which I believe gives me a different philosophy and perspective from many performance coaches. After an eight year, undistinguished and mediocre professional playing career (2 years in the German minor leagues and 6 years in professional indoors), I ended up finishing my bachelors (Coaching Science) at George Mason University and went into the graduate program (Exercise Science) there while working with both soccer programs. While coaching at Mason and doing the youth soccer circuit, I had the opportunity to participate in a UEFA/European ‘A’ license soccer coaching course in the Czech Republic in 2004. The 5-week course was conducted at Charles University in Prague, and, besides teaching a variety of coaching methodologies, it was also highly scientific, and was a fantastic introduction to the Eastern European perspective on performance enhancement. Following this course I “transitioned” to the title of fitness coach for the George Mason men’s and women’s soccer programs, as well as the Washington Freedom women’s team (currently a WPS franchise). Currently, I am the fitness coach for the Seattle Sounders FC (MLS), and will be finishing my fourth year in the league (’07 & ’08 in Kansas City).

Regarding my philosophy of preparing soccer athletes, I would say that 80% of the work I would do is fairly specific. It’s funny that a lot of people think of “sports-specific”, and they think of doing something in a weight room, that may mimic the movement patterns of the sport. I am a strong believer in soccer-specific training, meaning that the athletes spend most of their time on the field, with the proper footwear, using a ball. I think the best way to do a majority of fitness work is to utilize different game forms to train the aerobic or anaerobic systems in a game-related manner. However, I also believe there are crucial components that make up final 20% of work that needs to be done which are outside the playing field. I think maximum strength work is important in the off-season, as well as work in the gym aimed at targeting the alactic and oxidative systems. In our league, it’s very difficult to make strength gains in season, but our aim is to maintain strength, and do any necessary stability and corrective work that may prevent injuries.

What I am looking at this year, as my philosophy “evolves”, is getting that balance right between the 80% specific work vs. the 20% non-specific work. We have started to see with this group in Seattle, as we get into a lot of games, and end up in a weekly rhythm of game-recovery training-pregame training-game, etc. we actually end up seeing a drop in fitness levels slowly over a 4-6 week period. This is the case especially with our less fit players. Is it because the load of the game is not strong enough to stimulate fitness gains (maybe the less fit players play more

conservatively), or is it that the oxidative or glycolytic systems aren't really fully recovered before having to play in the next game? I think this speaks for the importance of that 20% of non-specific work that seems to fall by the wayside with so congested playing schedule.

2) There has been a lot of discussion lately about aerobic training. Soccer is a sport of short intense bursts followed by periods of recovery (jogging, moving into position, etc). Many want to just do intense interval training and forget about the importance of total energy system development. Can you please talk a little bit about the energy system development work you do with the Seattle Sounders, and how it fits into the overall training program?

Well, first we'll need to come to the agreement that soccer is an alactic-aerobic dominant sport. Meaning that the typical movement profile within a match involves a player making, on average, a 20-meter sprint every 30-90sec over the course of a 90-minute match. Depending on the position, players will make approximately 50-80 sprints in the game, and yet cover 10-14km (check research by Thomas Reilly, Jens Bangsbo, or Raymond Verheijen for more specifics). So, we could then assume that most intense actions are short enough that the energy required can be fulfilled by the alactic system, and the resting intervals should be enough time that the oxidative system aids the replenishment of ATP for the alactic system. So, if I come to this conclusion about the sport of soccer, then what role would anaerobic (lactic) intervals have within my program? Why would I want to train my system to create large amounts of lactic energy?

I don't want to totally minimize the importance of the lactic system, however, in energy production within a game. There will be periods of time that a player's alactic system is not fully recovered, or that the required workload becomes too high, and an athlete will need to fall back on his/her lactic system to provide energy. However, it appears that an over-reliance on lactic energy can be very taxing on the body, and is not efficient.

I made an interesting observation last year when Seattle was lucky enough to play summer exhibition matches against world-class club teams FC Barcelona and Chelsea FC. Watching someone like Lionel Messi play, arguably the best player in the world now, or Drogba and Anelka at Chelsea, it was pretty clear that the higher the level of play becomes, the more alactic-aerobic it is. Messi would stand right in front of us, and float slowly across the field, until BANG, at the right time, he would take off like a 100m sprinter, to look to get the ball behind the defense. After his run, he would continue to float and probe until the next opening came. His play couldn't be any more alactic-aerobic. If you watch a typical average level US college soccer game though, you will see a frantic paced game, that probably borders more on a alactic-lactic type sport at times, where the goal is to keep this non-stop pace up until the coach substitutes player out (only 3 subs are permitted in pro or international soccer) to replace them with fresher players who can maintain this frantic pace. The higher the level of play, the more alactic-aerobic the game becomes, probably because of how well pro players control the ball, as well as because of how well conditioned most are.

To me, this is more justification to train sport-specifically. Use the ball and training games, vary durations of work, and modify the size, shape of your field to train the energy systems you want. We have found that playing 5 against 5 type exercises on slightly large fields will elicit HR ranges in the 90-95% zone fairly easily. We can then program 4-8min "aerobic power" type

games to stimulate pretty significant aerobic adaptations. Look at any research done by Hoff, Helgerud, & Wisløff out of Norway, and you will find some pretty compelling data on the aerobic adaptations that can take place with this type of specific work.

The biggest mistake that coaches make, however, is the lack of ability to program the alactic training effectively. I was lucky enough to see several great examples of this in the Czech Republic, where they are masters of it. It's important to create different 1v1 or 2v2 exercises where players are asked to work maximally for 6-20sec, but then given about a minute of rest before they go again, to truly overload alactic capacity in the right way (6-12sec work, work:rest 1:8-10). Alactic capacity is fairly genetic, and difficult to influence, which means that training sessions to target it, must be right on. Typically, coaches will not give enough rest, and it soon becomes more of a lactic power exercise (20-30sec work, with a work:rest of 1:3). What coaches don't understand, is that, if the work part over 6-12sec is truly maximal, then the proper rest period will also train the oxidative system to recover effectively as well. I have also found that hill sprints and sled pushes over this same work and rest scheme also help to create adaptations that improve "soccer-specific" performance pretty significantly as well. This sled and hill work can become an important part of that "non-specific 20%" programming.

Beyond the scope of soccer training, just when looking at "interval training", I think it's prudent to really investigate whether someone is talking about sprint interval work (SIT), or high-intensity interval work (HIIT). SIT would appear to target the alactic and aerobic systems pretty well (6-10 sec work, >40 sec rest), while HIIT work (longer duration of work, less rest) would seem to target the lactic system more. So, coaches just need to be clear that these two types of intervals will elicit different types of adaptations over time. There are a lot of younger American players now that come into our league who have clearly trained almost exclusively with HIIT methods of conditioning training. My experience is that some of these athletes don't make it because they are losing that "pop" or that sharpness. We recently had a high draft pick player who could do 300yd shuttles the entire day, and not fatigue. But he never seemed like he could be explosive. At the same time, we had an older European ex-World Cup player, who was heavily reliant on his speed for his style of play. When we would do plyos, this older European player would be exhausted after doing eight high hurdle jumps. His work was visibly maximal. This college players would jump over the eight hurdles (not visibly maximal), jog back and be ready to do it again. I tried and tried to get him to do things more explosively, but it seemed to be difficult to change. Slowly, I came to the realization that with our over reliance on HIIT work, we may be creating a culture of athletes who can do things at 90% speed all day, but can't do things maximally when they need to.

3) I know you guys are using the Omega Wave with your athletes. Can you talk about how you are using the Omega Wave and how it helps you dictate the training program for individual athletes?

For those of you who don't know, OmegaWave is a non-invasive assessment tool, used to measure the readiness and level of optimization of all of the functional systems of the body, prior to a training day or week. The athlete wears a series of electrodes (including EKG), and the OmegaWave device measures over a five-minute period: HRV, metabolic capacities (DiffECG),

and neuromuscular fatigue (Omega potential). The data from the assessment are immediately available after completion of the test.

We typically test all players who started a match the morning of the first recovery session following a game. This assessment then gives us a snap shot of where each player is at in terms of fatigue. Not just the level of fatigue, but more important, we get an indication of which specific system may be the “weak link” for that week. For example, we have some “sprinter” type players who experience a lowered Omega potential implying a certain level of CNS/neuromuscular fatigue after every match. It could be 48 more hours until that athlete can really gain any adaptation from speed or power work.

The biggest area we use it for is to look at HRV, and which players become more sympathetic (SNS) or parasympathetic (PSNS) dominant during their recovery phase. Athletes who become more sympathetically dominant eventually have a significantly higher risk of muscle injury over time, per my observations this year. It’s actually been possible to predict most of our muscle injuries this year through OmegaWave. The issue at the professional team level is determining as a staff how to modify an individual’s training load within a team setting to prevent an injury from then occurring.

The alternate danger group distinguished through HRV, are those athletes who become overly parasympathetic over time. My experience this year has shown that soccer players with a strong glycolytic make-up, with concurrently lower oxidative capacities, are far more likely to have strong parasympathetic dominance in their recovery phase. As a result, such athletes seem to have the sensation of “shutting down” – they experience lowered RHR, can be a little sluggish in training, and show signs on their OW assessment of hypothyroid function and lowered hormonal output. We have 3-4 players in this category, and they are really good with following the protocol we’ve set up for this (after consultation with Val Nasedkin and Joel Jamieson) involving contrast recovery work, some specific high-resistance bike intervals, and nutrition modifications. According to the Russian designers of OmegaWave, athletes who are “slightly” parasympathetic are said to be an optimal state, but these athletes end up being significantly parasympathetic dominant.

Finally, the metabolic assessment on the OW gives us feedback on the oxidative, lactic, and alactic capacities of the athlete, as well as concurrent physiological markers such as AT, RHR, VO₂max. What these all do is give us insight into the long-term adaptations to our training program. Val Nasedkin, the Russian designer of OW, thinks that most training adaptations in team sports should be aimed at improving oxidative abilities. I would have to agree in the respect that our players with huge “lactic” engines are able to cover a lot of ground in a match. But there fatigue is deeper and far more severe (typically very parasympathetic), and they take longer to recover from games. Verkhoshansky methodology, laid out in Block Training System in Endurance Running seems to support Nasedkin’s belief as well. He continues to stress how important the decrease in blood lactate accumulation is for improved performance. As a result, the aim of Verkhoshansky methods were to train to improve the oxidative capacity of both slow and fast twitch fibers through the increase of mitochondrial density.

At the end of the day, it would appear that metabolically, it may just be important for you to have at least one big engine, whether it be the lactic or oxidative. Since we are always getting new players in, it's important to remember that these metabolic adaptations are very long-term types of adaptations. With OW, it's easy to note the genetic tendencies of athletes to rely on one system or another. It's also fairly easy then, with this metabolic assessment tool, to see which athlete's systems (lactic, oxidative, or alactic) respond quicker to training. We have some speed/power players with us that take forever to make decent aerobic/oxidative adaptations, because that's just not how they are genetically wired. This allows us to see that, and by patient with such an athlete.

4) Recovery is an essential component for athletes between training, competition, and travel. Can you speak to the recovery strategies that you have in place with the Sounders?

Beyond some of the ideas above regarding recovery, there are some other different things that we do. At this point in the season, we have about three games per week. If we have less than three days before the next game, then our players will do a "non-impact" recovery, which will involve 20 minutes on a spin bike, followed foam rolling, stretching, plus some mobility and stability exercises. With so little time to do strength training at this time in the season, we also need to add in some core, upper-body, and body weight strength work on this day. The biggest issue we have in this sport regarding training programs and recovery work is the decision of how much specific work to do the 2nd day after a game. Many soccer coaches want to begin to do a lot of field work again, thinking that the players have already had one day off, but I have found that typically, players are still in a pretty fatigued state still 36 hours after a match.

We also have a full time massage therapist, who will work with different players over the course of the week. We are lucky that our medical staff consists of a physical therapist (head trainer), an ATC, and massage therapist, so our athletes are well cared for. I have also brought in an assistant, Jordan Webb, who is certified in PRI (Postural Restoration), to be able to monitor movement dysfunction that we may need to address in different individuals over the course of the season.

5) Thanks for the great interview, Dave. I am sure the readers appreciate the information you have shared with us today. Can you please tell everyone about anything you have coming up in the future (projects, lectures, etc)?

Well, we will be flying around 20,000 miles in the next two months playing in various places through North & Central America, so the best chance you'll have to see me is in the airport!! I was just interviewed by Anthony Renna for the StrengthCoach podcast, so that should be up on iTunes soon. The only other lecture activity I really have is at the MLS Athletic Trainers Conference, which runs concurrently with the MLS Combine, in January in Miami. I will be doing a presentation on how we are utilizing OmegaWave as a tool to prevent injuries.

Thanks for the opportunity for the interview Patrick, and keep up the good work!!