Sports Pharmacy

DECODING THE SCIENCE OF ELITE HUMAN PERFORMANCE

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PRIORITIZING HEALTH

"Playing Pickleball Was My Game Changer"

Unraveling GLP-1s for Athletes of All Levels

Stress and Anxiety on Nutrition Intake in Athletes

Letter From the Editor

Dear Sports Pharmacy Magazine Subscribers,

Happy New Year and welcome to the January issue of Sports Pharmacy Magazine! As we step into 2025, it's the perfect time to reflect on the goals we've set and the health journeys we're embarking on. New Year's resolutions often center around living healthier, more balanced lives, and this issue is here to inspire and support you in achieving those aspirations.

In this issue, you'll find insights from top experts in sports medicine and pharmacy, actionable tips to incorporate into daily routines, and inspiring stories of resilience and transformation. We'll also spotlight the role of interdisciplinary care in promoting holistic health for athletes, demonstrating how pharmacists, dietitians, mental health professionals, and other specialists can work together to make a meaningful impact.

As always, thank you for being part of the Sports Pharmacy Network community. Your passion for clean sport and athlete care fuels our mission. We're thrilled to continue this journey with you, and we can't wait to see all that we'll achieve together in the year ahead.

We're also excited to share that we'll be hosting the inagrual Clinical Sports Pharmacy Summit this April 11th-12th in sunny Fort Lauderdale, FL. Come explore the world of sports pharmacy and network with experts in the field. You can find event and registration details on our website.

Here's to a healthy, happy, and successful New Year!

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What Athletes Need to Know about Wellness and Anti- Aging Clinics

"Playing Pickleball Was My Game Changer"

By Dr. Abbi Linde, PharmD, CDCES

AUTHOR BIO:

Abbi Linde is a pharmacist by training that has transitioned to health coaching. She educates about self compassion, the impacts of lifestyle choices and real life behavior change tools to support others in making lifestyle changes and reversing chronic disease.

I have always joked that I'm an athlete. If I look at the facts, I AM AN ATHLETE! I played three sports in high school, although I dropped out my senior year to participate in Academic Decathlon (taking tests for fun competitions). I played Club volleyball in college and volleyball in my adult life sporadically. However, I'm also pretty awkward and so when people look at me, they don't see an athlete. In my heart of hearts, I've always self-identified as an athlete. So it should come as no surprise to me that the thing that has finally motivated me unlike any other thing is the sport of pickleball.

I have tried all the things to motivate myself to stick to my healthy behaviors. I have known for many years, since having my first child 10 years ago, that when I eat mostly unprocessed foods, in a low carb way I feel my best. I have high energy, my brain feels sharp, and I can wake up in the morning ready to go. Yet inevitably, I had never been able to stick to this way of eating for more than a month or 6 weeks at the most.

Behavior change experts will say that I needed to find my *"Why"*. Perhaps I would be sufficiently motivated by thinking about being healthy for my kids? Or perhaps thinking about my genetic risk factors and higher risk for heart complications and dementia? Maybe even thinking about wanting to stay out of the nursing home as an older adult woman?

Nope, none of those things worked. And truthfully, I felt a lot of shame about those really important things not being motivating enough for me to stick to my way of eating, my exercise plans, or any other behaviors I was needing to modify for my health.

And I should also mention I'm a pharmacist and a health coach. I help people figure out how to stick to their food plans and their lifestyle behavior changes. So it was all the more shameful that I couldn't do it for myself- until pickleball.

I was introduced to pickleball a couple years back by some of my best friends. To be honest, it irritated me that they had started before me and were a little bit better than me. I had some work to do to catch up with them in terms of skill (still working on that actually).

And so my journey began to the tune of playing pickleball several days a week and getting annoyed if I had to miss one of my standing dates. It was fun. In fact, it was probably the most fun I've had in a while as a grown adult with real responsibilities.

Over time, my skills improved, but I could tell that some days I was on and some days I was off. As a big fan of experiments, I decided to experiment to figure out what I could do to be better at pickleball. So began my exploration of lifestyle behavior changes for enhancing my performance as well as my "Performance Enhancing Lifestyle (PEL)". What I realized was that pickleball motivated me like nothing else ever has to stick to my behavior changes. And as a bonus - Those behavior changes made me feel great outside of pickleball too.

Behavior Changes

#1 Dietary choices: I find I play my best pickleball when I am thinking the least. Fast reaction times and a clear mind definitely seem to improve my pickleball skills. When I am locked in on my low carb food, with plenty of protein, and enough overall calories, my brain works best. I am able to think clearly, without overthinking my shots, and maintain energy throughout the 2-3 hours of play.

#2 Strength training: Strength training is something I have been trying to implement consistently for many years. It has been practically impossible to move through

the resistance (pun intended) and lift weights with any regularity. I just hated doing it. Since pickleball, I stay motivated by reminding myself that this will help me get those out-of-range dinks, slam the ball right at my opponent's body harder, and improve my endurance. I have been shocked with how finding the right motivation has been a game changer.

#3 Sleep: Now sleep is something I have felt very strongly about over the past several years. And I actually don't generally have a hard time getting enough sleep. But this has been such a good reminder! If I don't get good sleep for more than 1 day in a row, my reaction times and pickleball skills suffer big time. So I make sure that I don't let that happen.

#4 Breathwork: In the past several years, I have successfully used breathwork as a tool for anxiety and pain. I'll go into phases where I am consistent about it and then of course fall off the wagon. I've noticed that my breath control from a cardiovascular endurance perspective is improved when I am consistently doing breathwork. Whenever I just really don't want to put in the time for breathwork, I think about pickleball.

#5 Mental fortitude: This is how I define the ability to overcome errors in a game. I have to admit that I'm not that competitive, but I do hate when I am playing poorly. I would much rather play great pickleball and lose, than play terribly and win. So, this means when I make a mistake, or several in a row, I can often get pretty down on myself quickly. And so, I work on having a short memory about my mistakes. Using affirmations to keep me positive or neutral rather than negative helps tremendously. And wouldn't you know- this skill comes in handy in the rest of my life too. When my mental fortitude is functioning well, I function better in my life.

#5 Alcohol: I know from wearing my Oura ring that when I drink alcohol (even just 1 serving), that my heart rate variability (HRV) drops sharply. A better HRV means better pickleball playing for me. I also have noticeably lower quality sleep when I have had alcohol. And since sleep is a big factor that helps my pickleball skills, alcohol is almost universally avoided when I want to be good at pickleball.

#6 Physical therapy exercises: As an athlete with chronic neck pain, I have been to physical therapy several times in my life to work on my back, shoulder and neck strength and mobility. After each physical therapy period, I will always be great about doing stretches and exercises for a while. Inevitably, I forget, get lazy, or just don't want to spend time doing them. When my neck hurts during pickleball or, God forbid,

> *I know from wearing my Oura ring that when I drink alcohol (even just 1 serving), that my heart rate variability (HRV) drops sharply.*

prevents me from playing, that is just unacceptable. Again, pickleball motivating me to stay committed to doing my exercises has helped my pain outside of the game too.

Medications/Supplements

Once I had optimized my behavior changes, I decided to start exploring supplements and over-the-counter medications. I thoroughly enjoy the surprised looks I get when I announce to the pickleballers I need to take my *"performance enhancing drugs"*. When I clarify that I mean ibuprofen, caffeine, and electrolytes, we all get a good laugh in!

#1 Ibuprofen: Although my breathwork and neck exercises are often successful, when I have pain, acute use of ibuprofen is necessary because I'm getting old. If I take it just as I am starting to play, I can feel it kicking in as I loosen up and pain starts to dissolve. My mood generally increases as well when I am pain free. Anti-inflammatories for the win!

#2 Electrolytes: I typically use an electrolyte supplement because of my low carb intake that I mentioned. I feel a noticeable difference if I forget to take my electrolytes for a couple days, but I find it's even more important when I'm playing pickleball. Typically, our pickleball sessions last two to three hours, and I have found that the electrolytes keep me in the game much longer than drinking plain water from an energy and focus perspective.

#3 Caffeine: I spent the majority of my adult life avoiding caffeine except for the occasional guilty pleasure of Mountain Dew. For a long time, I thought caffeine was contributing to some headaches that I got regularly (turns out it was mostly my neck). Within the last couple years, I've actually been toying with using caffeine as a reinforcement tool for good habits. I learned that caffeine is not only self-reinforcing, but can also reinforce anything else that you ingest or are doing while taking caffeine. I started drinking caffeine while getting morning sunlight and taking cold showers. So I started to love caffeine!

Then I started to love caffeine a little too much and decided that I needed to taper off and quit. What I noticed when I quit was that I had a noticeable drop in my pickleball skills. I did stay the course for a few weeks, but then decided that perhaps I could use caffeine just on pickleball days. Being off of caffeine for a couple days between uses actually allows the caffeine to have more maximal effect. That worked swimmingly - until it didn't. I'm back on caffeine everyday right now. It will probably be an ongoing experiment between using caffeine to get myself to do work, build good habits, and saving it for pickleball performance.

Wrapping Things Up

Now, since I'm a pharmacist, but not your pharmacist, you know I have to remind you that these are MY experiences. I'm not recommending that you do all the same experiments as I did or that they will work for you. Pickleball has been motivating in a way that nothing else in my life has been.

This New Year, consider letting this season of resolutions be an opportunity to find a fresh motivation. Whether it's pickleball or something entirely different, choose a goal that excites you and sparks joy in your daily life. Embrace it, and make this the year you resolve to prioritize what genuinely motivates you!

So perhaps I am recommending that you give pickleball a try. Or at least find something, anything, in your life that motivates you differently - and then do it guilt free!

Unraveling GLP-1s for Athletes of All Levels

Highlights from The Sports Pharmacy Network Podcast

Hosted by Brandon Welch, PharmD & Jessica Beal-Stahl, PharmD

The Sports Pharmacy Network Podcast brings you dynamic conversations at the intersection of sports and healthcare. Join Dr. Brandon Welch and Dr. Jessica Beal-Stahl as they sit down with a variety of expert guests, including pharmacists, physicians, dietitians, athletic trainers, mental health professionals, and other specialists, to explore the latest in sports medicine and athlete care. Whether you're a healthcare professional, athlete, or sports enthusiast, the Sports Pharmacy Network Podcast is your go-to resource for optimizing health and performance.

Introduction

Dr. Brandon Welch: Our conversation today is going to explore the popular compounds, semaglutide and t irzepatide, which have gained immediate popularity for the remarkable benefits of helping patients lose weight and improve their metabolic health.

This conversation aims to provide insights into whether these compounds could give athletes a competitive edge and be considered a performance enhancing drug or PED. Currently, these medications are not banned by WADA, the World Anti-Doping Agency or any sports regulations.

Dr. Jessica Beal-Stahl: This is such a huge topic, especially on social media. Everybody's talking about the new weight loss drugs and so I think it's really important to highlight how it can possibly improve an athlete's performance or hinder it.

Mechanism of Action

Brandon: This molecule, semaglutide, or ozempic, which is the trade name, has been emerging in the industry for some of its groundbreaking news around weight loss and treating type two diabetes.

Semaglutide was first approved in 2017 to treat type two diabetes and it has garnered a lot of attention among celebrities and social media influencers due to its ability to help you lose weight rapidly and suppress appetite because of its long duration of action. But it's important that athletes take caution when using GLP-1s and consult with a healthcare professional for better guidance.

I want to talk about semaglutide first as one of the more popular weight loss drugs and its mechanism of actions. And so when we think of semaglutide, it is a GLP-1 agonist, which stands for a glucagon-like peptide. It's available in two dosage forms. It comes as an oral tablet, with its trade name being Ribelsus, which is a once a day tablet, or it comes in a weekly injectable form, which is called Ozempic for type 2 diabetes and Wegovy for weight loss.

Now, in order to understand how GLP-1s actually work inside of the body, it's important that we discuss how this molecule actually works naturally since it is an endogenous hormone. So just wanted to kind of get your thoughts on how Glucagon-like Peptide 1 (GLP-1) actually works in the body and its mechanism of action.

Jess: So as we know, like you said, it's naturally occurring in our body and that happens mostly in our small intestines. And these are peptides that modulate blood glucose metabolism by facilitating the pancreas to release insulin and to help reduce blood sugar.

I think we're all pretty familiar with the role of insulin and blood sugar and how it helps with energy and metabolism. So, we'll kind of skip over that. But I think it's really important to note the mechanism of action of this drug. And there's a couple different ways that it works to help with controlling blood sugar, controlling type 2 diabetes, but also helping with weight loss.

The first one I just mentioned was that it simulates the release of insulin from the pancreas. And this obviously can help with blood glucose regulation and control, but

it's also helpful for weight loss because you're not having these highs and lows and spikes of blood sugar making you crave food.

The next mechanism that it works on is that it actually suppresses your appetite and it slows the rate of food absorption in the stomach. By suppressing your appetite and by delaying gastric emptying is usually the terms they use. This makes you feel fuller longer, so it makes you not want to eat as much and have increased satiety. And so this can lead to an overall lower caloric intake because you do stay fuller longer.

It's also believed to have effects on two hunger hormones, leptin and ghrelin. Leptin increases your appetite and ghrelin decreases your appetite. So it kind of works to balance those hormones that your body produces naturally also.

Brandon: I think there's also two more mechanisms that you can kind of say that it works on. One is it may help decrease inflammation in the body. And there was a Lancet article that kind of came out showing that it reduced CRP, which was a marker of inflammation.

And the last I find really interesting is that it actually works in the gut brain axis too. And they found that there's GLP-1 receptors in your brain. And so by working on these, they believe it helps stop food cravings and also what a lot of people call as food noise, meaning that they're constantly thinking about eating or wanting to eat. And by working this way, it may also help with addictions such as alcoholism.

And another interesting thing about this molecule; not only is it suppressing the appetite, but it's also regulating blood sugar control and it's overall helping with one's metabolic health. You remember there was an article that came out a few years ago, excuse me for not remembering the name, but it does have that benefit of improving cardiovascular health. And so, it almost seems like it's a miracle or magic drug being able to support all these different health benefits inside of the body.

But I guess for the purpose, too, why most people are using it is for chronic obesity, because of its ability to suppress appetite so significantly to really help people have good discipline and control over their cravings.

Jess: Yeah, I may modify what your statement of chronic obesity, because there is a lot of people using it for more cosmetic uses, maybe not chronic obesity, but if you look at it in a way of a tool to help you modify your habits.

And so by using this as a tool to help you work with nutritionists, pharmacists, health coaches, to modify your habits so that going forward, you have healthier habits, I think that's a way to look at it. Remember, it was FDA approved and indicated, at least for Wegovy, it says for chronic obesity and people always gloss over this in conjunction with diet and exercise.

So those are like the two key pieces, diet and exercise, because once you come off this medication, you need something else to lean on from a lifestyle management perspective to maintain some of those healthy habits and some of those lifestyle modification results.

Brandon: Yeah, I was going to say one of the STEP trials that was just released that showed, as most people fear, they regain a lot of the weight. And it's because they weren't, I think they didn't dive into it, but a lot may of that be due to not having the lifestyle, the exercise, and the diet modifications and the new habits accompanying the medication.

Jess: Right, behavioral changes are what's going to give you more longevity and sustainability in the event that you have to come off this medication. And the whole concept or idea is to adopt some of these new behavioral changes while you're on this medication. Essentially, it's to help give you a kickstart to a new lifestyle to live a healthier life.

Supply and Demand

Brandon: With this medication, obviously gaining such popularity, as you can imagine, the supply can't always keep up with the demand. There's been a lot of compounding pharmacies that have come to market to help manufacture semaglutide. They have also been combining it with other ingredients. The most common one that I've seen is vitamin B12.

Jess: Yeah, I've seen it with B6. I saw an interesting one the other day actually of Tirzapetide with BCP157, a peptide. It is a known banned substance, but it does help with joints and GI tract healing. I found that was a really interesting combination.

And if you are looking to use a compounding pharmacy for GLP-1s, you need to do your research and make sure they're accredited. The other thing I think with compounding pharmacies that needs to be highlighted is that they don't have to be made at the same concentration that the commercially available products are. And it's worth noting, the number of overdose calls to poison control about GLP-1s.

Brandon: Up 1500% since 2019.

Jess: I was shocked. A lot of it has to do with people getting the compounded version. Or unfortunately, you can also buy these online through peptide suppliers without a prescription that are technically

considered "research products". So people are able to purchase them without a prescription and don't know what they're actually getting.

Brandon: Absolutely, it's extremely important to be very careful and do your due diligence if you're trying to go outside of buying this at a retail pharmacy and go through a compounding pharmacy or trying to buy this online. Ask the questions, do your research.

Risks and Benefits

Brandon: So what are some of the risks and benefits we see on these new weight loss medications?

Jess: I do work in a community pharmacy and I see these commonly used. I do see the benefits, especially in our diabetic population. The main benefit is going to be blood sugar control, for everybody. But some of the other benefits you're going to see is weight loss. And some people may have body composition changes, meaning they lose some body fat and maybe become leaner. Then you will also see reduction in cardiovascular disease risk and metabolic disease risk. We're also seeing some potential to help with alcohol addiction or food cravings. I think those are some of the biggest benefits. Are there any I'm missing?

Brandon: No, you've pretty much hit all of them. And so yes, these medication do have some really good health benefits to it. But unfortunately, there are risks as well, especially if not used appropriately.

So let's talk about some of the side effects that you may get from this medication. You may feel a little bit nauseous. Sometimes this medication can cause you to vomit or cause you to feel like you want to vomit. So it's very important that you make sure that you're still eating enough during meals, having better portion control while you're on this medication because it is going to suppress your appetite. But if you're not eating right, you're more likely to experience nausea.

It can make you feel bloated. Some people do experience some diarrhea or other forms of gastrointestinal distress, like constipation. One thing we really want to stress when it comes to taking this medication, you have to make sure you're drinking enough fluids. And so overall, it's very important to work with a dietician or a nutritionist to make sure you're consuming appropriate nutrition and hydration to fuel your body appropriately if you are a highly competitive athlete.

Jess: Definitely. I was going to say one of the other risks that we've kind of hinted at is body composition changes. And I know this one for both of us is something really important for people to understand is that when you lose weight, you don't always lose just body fat.

And a lot of people on this medication and some of the studies I've seen come back with like up to 40% of the weight loss is of lean muscle. And for everybody, lean muscle and muscle is pretty much one of the big players for longevity. So you need that muscle to keep your body metabolically active, for health, for so many things. And by losing a ton of lean muscle, you can actually have some negative effects also.

The other thing with body composition changes and loss of lean muscle, they're starting to say that there may be some loss in bone density. So that would

> If you are looking to use a compounding pharmacy for GLP-1s, you need to do your research and make sure they're accredited.

be increasing your risk of like osteoporosis or breaks when you have a fall. Two things that definitely could be very impactful.

Brandon: I want to touch on that loss of bone density. If you're compromising lean muscle mass, you're compromising the loss of bone mineral density too. And if you're compromising the loss of bone mineral density, when we're thinking about some of our competitive athletes, it's increasing your risk for stress fractures.

Jess: I think one more that maybe we could touch on is nutrient deficiencies, especially if you're taking other medications or an athlete and just not eating enough. So what are your thoughts on the nutrient depletions with these?

Brandon: Yeah, the nutrients are going to be key because they're going to help with optimal recovery. But with it sparing or compromising muscle mass, when we're thinking of nutrients, protein is going to be one of the key things that I think of. And making sure that we're getting enough fiber because fiber is going to help hydrate the stools to make sure you have regular bowel movements since one of the drawbacks or side effects from these is constipation.

Jess: Yeah, definitely agree with all that. Work with the nutritionists, understand what you might be lacking and what you need to support your body more or making sure you have a good nutrition plan for how many macros of carbs, proteins, fats you're getting to make sure that you're as full as you can be. But is there anything specifically risk-wise, Brandon, you would think of if you were an athlete or someone who competes at more than just a recreational level if you were on this medication?

Brandon: Yes, hypoglycemia is going to be a big thing that we watch out for. I may recommend athletes use CGMs, a continuous glucose monitor, while on this medication, just as a precaution. Endurance exercise can cause less resistance to the glucagon like peptide and can increase risk for hypoglycemia. It's really going to come down to making sure you're fueling your body sufficiently so you don't run into any type of hypoglycemic episodes.

Use in Athletes

Brandon: So when we think about these medications being potentially abused by athletes, what are some of the ways you could see some of these athletes essentially abusing this medication?

Jess: The first one that comes to mind is to make a weight class or keep a weight. It will help with the hunger control and appetite control. So I can see them using that to get an edge to maintaining a weight. Then also to change appearance, when body dysmorphia comes in to play or just an image that you want to achieve for a sport.

There's a lot of substances that are already banned that fit this exact model. Therea are stimulants that can suppress your appetite and they can help you focus. For example, phentermine, which is an appetite suppressant that is a banned substance. Diuretics can help you lose weight and make a weight class, and that's already banned.

So you can kind of see a trend that this may be something that can help an athlete gain an edge. And if the athlete is working with somebody to help them maintain their energy levels, their fueling, their protein, and muscle mass that could be the way an athlete gains an edge. What are your thoughts?

Brandon: Yeah, I agree. Any of these medications that can help you gain an edge by making a certain weight class have the potential for abuse. But we always have to remember there's a cost to everything. And the risk isn't always worth it. This is a sport that you worked very hard for, and for you to do something that's going to cost you the rest of your career, I don't think it's worth it.

Jess: Yeah, definitely. If you're a competitive athlete considering this to get an edge, definitely not worth it. If you're a recreational athlete trying to get healthy. Maybe it's something you can use, but you still have to do it in the right ways.

Are GLP-1s Banned?

Brandon: So let's switch gears a bit and talk about the governing body that really helps protect athletes from potentially abusing medication, which is an international independent agency called WADA, other words known as World Anti-Doping Agency. If you want to lead us into talking about the World Anti-Doping Agency and some of the things that you've experienced with that.

Jess: Yes, so I actually still am a drug tested athlete. So I get to experience being drug tested at all the national international competitions. I do have to follow WADA. I actually follow the United States Anti-Doping Agency (USADA), which uses WADA's guidelines.

WADA is the international agency that is basically funded by sports and governments to maintain clean sport, to keep the essence of sport alive and fair and just the beauty of sport. So it's what like all Olympians

have to follow when you get drug tested, is making sure this is where all athletes can participate when it's, like I said, clean sport, doping free and on an equal level.

They also look into research, education, anti-doping education, and they do monitoring, which is drug testing basically. And they also put out this list of prohibited substances every year. Usually in October, they put out what's going to be the changes for the next year.

Sometimes a drug may be prohibited at all times, meaning in and out of competition and sometimes drugs are only be prohibited in competition. Then it is divided at group levels such as anabolic steroids, hormones, stimulants, and other very popular performance enhancing drugs.

Brandon: According to WADA, if a drug meets two of three criteria, it should be banned. One, it has the potential to enhance performance alone or in combination with other substances or methods. Two, it represents an actual or potential health risk to the athlete or three, it violates the spirit of sport. If it checks off two out of these three buckets, then it would be considered a banned substance.

The anabolic hormone or for the purpose of this discussion, the GLP-1, like we discussed, does have some potential health risks it can cause an athlete, so it may check off that box. But then looking into some of the performance or competitive edge advantages it can give an athlete or if it's overused, it can check off the box for it violating the spirit of sport. So this is something to really have a discussion about.

Jess: I think if you look at the list of banned substances, a lot of them make sense. Simulants like Adderall, they help you focus and give you an edge. Obviously, steroids make you gain muscle, get bigger and stronger. You go through the list and they make sense when you understand how the drug works and why an athlete could benefit from it.

So they did add semaglutide as a substance in the monitoring program for 2024. This is when WADA will analyze these substances and evaluate patterns for use. Athletes will not incur an anti-doping violation if they're using it, but they're trying to gain more knowledge on the substance.

There are other drugs on the monitoring list for 2024, but semaglutide was listed to see how many athletes are using it and what is the prevalence in sport? I found that really interesting and it was semaglutide specifically, Tirzapetide or any of the other GLP-1s.

If you are an athlete or a healthcare provider working with athletes who are drug tested, it is important to know where you can get the prohibited drug list. WADA does have a website. It's www.wada-ama.org

And then there's also an amazing site that I use often called Global DRO, which is Global Drug Online Reference, where you can put in the sport, the country, and the drug, and it will tell you if it's banned in or out of sport. This is very helpful when you're working with athletes.

And if it is banned, it will also help you with guidance to obtain a therapeutic use exemption (TUE) if that is medically necessary and needed.

How does a substance or method make it to the prohibited list?

The WADA Prohibited List may include any substance and methods that satisfy any two of the following three criteria:

01	It has the potential to enhance or enhances sport performance;
02	It represents an actual or potential health risk to the Athlete;
03	It violates the spirit of sport (this definition is outlined in the Code).

Substances or methods which mask the effect or detection of prohibited substances are also prohibited. In addition, a substance which has not been approved for human use is likely to be prohibited as well.

The Prohibited List is reviewed annually in consultation with scientific, medical and anti-doping experts to ensure it reflects current medical and scientific evidence and doping practices. The Prohibited List comes into effect on January 1st of each year and is published by WADA three months prior to coming into force; however, in exceptional circumstances, a substance or method may be added to the Prohibited List at any time.

https://www.wada-ama.org/en/prohibited-list

> Muscle is the body's fat burning machinery. If you build muscle, it's going to help your body kick off fat.

Wrap Up

Jess: So I guess we could probably wrap this up with some ways we can help athletes of any level, making sure that they are doing the right thing and helping support their body? What are some tips we could give, practical tips, if you are on this medication for a medical reason?

Brandon: Definitely use the guidance of a sports dietitian, a nutritionist or a lifestyle coach. And then from a nutrition standpoint, mainly protein that's very dense. Protein in the form of liquid may not be as satiating as protein in the form of food.

Creatine and carbohydrate powders to help with muscle retention. Remember that when we take creatine, it's important that we're drinking enough fluids because of the circulation of water going to the muscle tissues.

Then making sure you're getting enough fiber in your diet. I always say for men, anywhere between 30 to 40 grams. Even though it's not considered an essential nutrient, it's one of the things that I feel like is often overlooked. So put simply, nutrition is going to be key and most importantly, using the guidance from a sports dietitian or nutritionist.

And then also resistance training. One of the most important physical activities. If you're a high performing athlete, I'm sure you're already doing some type of resistance training in your workout, doing progressive load. I always say this, muscle is the body's fat burning machinery. If you build muscle, it's going to help your body kick off fat.

Jess: I think many people misunderstand that when you lose muscle, you're lowering the caloric need for your body. So by gaining muscle and putting some muscle on, for many people, it makes them look thinner to begin with because it's just more dense. But also, it helps your body be able to function at a higher level. And you do need slightly more calories so it's constantly burning because it's active. You can never go wrong with trying to add muscle.

Brandon: Again, as we can conclude this episode just remember, safety and athlete health is top priority. You want to be a healthy person first, before we start to consider performance, because performance is a byproduct of health. If you're healthy, it's going to give you more longevity to your career.

This transcript is based on a podcast episode and has been edited for length and readability. While we have made every effort to accurately capture the essence of the conversation, certain sections have been modified or condensed to enhance clarity and flow. Some filler words, pauses, and non-verbal cues have been omitted. The views and opinions expressed in this interview are those of the speakers and do not necessarily reflect the official policy or position of the podcast producers or the Sports Pharmacy Magazine. Please visit sportsrxnetwork.com to listen to the full episode.

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Stress and Anxiety on Nutrition Intake in Athletes

By Hannah M. Sherwood, BA, CSCS, USAW L1

AUTHOR BIO:

Hannah Sherwood is on a team of strength and conditioning coaches at Colorado School of Mines, working with collegiate athletes while pursuing her MS in Sports Nutrition. She is also working with the University of Colorado-Boulder Men's Lacrosse Team. She received her bachelor's in Integrative Physiology from the University of Colorado-Boulder, where she competed on the rowing team. Being a former collegiate athlete allows for a unique perspective of what it's like to balance school and athletics. She continues to compete in the sport of Olympic Weightlifting while pursuing a career in both strength and conditioning and nutrition.

Have you ever wondered how stress and anxiety affect nutrition for athletes? Similarly to before a big presentation or speech, many athletes experience some form of nervousness before an important athletic endeavor. It's well known that athletes experience higher levels of anxiety.[1] To a certain level, a small amount of anxiety is normal and healthy.

What about when it starts affecting eating habits that will, in turn, affect performance? How can athletes lessen the negative effects stress and anxiety can have on fueling properly? In this article, we will break down how athletes can mitigate the adverse effects stress and anxiety can have on an athlete fueling properly.

Stress and anxiety are often used interchangeably. So, what is the difference? Defined by the American Psychological Association:

- *Stress* – the psychological or physiological response to internal or external stressors… affecting feeling and behavior.[2]
- *Anxiety* – an emotion characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune.[2]

While they are different, stress and anxiety often invoke similar physiological responses. When these effects are short-term, they don't usually present a red flag, typically going away once the external stressor is gone. However, it should be addressed when those feelings start to affect other areas, such as nutritional intake, performance, or persist beyond a normal time frame.

Effects of Stress

Short-term stressors are a natural part of an athlete's routine, as daily practice, training, and competitions put their bodies through stress and push their bodies to adapt, grow and improve. This stress is essential for driving physiological adaptations that allow athletes to grow and progress in their sport.

If high stress levels continue to persist, the body's stress response gets stuck in an "on" position. This means cortisol levels stay elevated.[3] Why is that a problem? The adrenal gland releases cortisol, and while it is critical to help your body stay healthy, such as for immune support, consistent elevated levels should be avoided. One of the side effects of elevated cortisol levels is an increase in appetite. There are many stress factors modulated by cortisol that have a more direct role in this increase in appetite.[4] Typically, the foods consumed while stress eating are high in fat and sugar, a pattern commonly known as "stress eating."

Nutrition is a critical part of the lives of athletes, and stress eating can have a detrimental effect on performance. One day of stress eating will not ruin hours of training, but ensuring it does not become a consistency is essential. Just like eating too little can affect performance, so can eating too much if it doesn't align with the athlete's goals. Poor fueling, lack of nutrients, and weight gain can all affect athletic performance and energy levels.

Effects of Anxiety

Have you ever felt nauseous or thrown up before an athletic endeavor? That's anxiety presenting itself. Some athletes only experience thoughts and feelings of nervousness, yet for others, it's a habit to empty their stomach before any event. I remember having teammates who would puke before every 2K test or not even be able to finish it due to throwing up in the middle from nervousness. Not only are they expelling nutrients before their body can digest them, but their body is in more physiological distress due to higher cortisol levels. Despite being common, it should not be treated as normal. There are some simple tactics to help combat pregame or event jitters.

Hunger loss is a reported effect of anxiety among athletes.[3] If this persists frequently, it can lead to adverse effects such as injuries due to being under-fueled and not receiving proper nutrients.

If anxiousness persists outside the usual nervousness of an athletic event, athletes should consider finding the proper healthcare provider, mental health specialist or sports psychologist with expertise in the area of managing anxiety.

Tools for Managing Short-Term Stress and Anxiety

Luckily, there are simple tactics for athletes that can help combat these short-term anxious and stressful feelings that arise from external events. Because of the similar symptoms, the same tools can be used to manage both phenomena:

- Focused breathing techniques[5]
  - » There are a handful of different techniques, but one is to close your eyes and breathe in for five counts, breathe out for five counts, and repeat. This doesn't require a special environmental setting or body position.
- Avoid/limit caffeine before events[5]
  - » Knowing how caffeine personally affects you is an important tool. Caffeine can have a handful of physical effects:
    - elevated heart rate
    - increased anxiety and jitteriness
    - increased gut motility - meaning the muscles that move food through the GI tract increase activity, which can lead to bowel movements
    - worsen symptoms of gastrointestinal issues
  - » That being said, different levels of caffeine affect each individual differently. Knowing how your body responds can potentially help mitigate these symptoms if present.
- Make sure to eat well-balanced meals on the days leading up to the event
- Eat foods that are easily digestible closer to the event (hour)
  - » Find foods you like; don't force yourself to eat something you don't like just because it seems healthy
- If symptoms persist extensively, talk to a healthcare or mental health professional with expertise in the area to determine the best path forward

Managing stress and anxiety that appear with athletic events or persist will not only help athletic performance now but also in future circumstances throughout life.

- Don't try new foods or fueling strategies before a competition, stick with what you know is safe and works for your body

There is no magic solution for all, and there are many factors that can affect the levels of stress and anxiety. Often, management requires trial and error for each person. It's important to note that hunger loss and an increase in appetite can be a symptom of both stress and anxiety. Like the tactics, it comes down to the individual's physiological response.[3]

Conclusion

Why is this important for athletes and people in positions in charge of athletes? Many interlinking factors affect athletic performance. The effects of stress and anxiety on nutrition intake are only a small part of it. If nutrition is affected, sleep can be affected, which can then, in turn, affect the immune system and vice versa. The interlinking web of factors of athletic performance provides a challenge for researchers, as there continues to be a need for research on the relationship between stress, anxiety, and nutrition intake.

Athletes are typically hard to recruit into research studies due to the already present demands of the sport and the desire not to do anything that could potentially negatively affect them. College athletes typically have travel and academics to worry about, while elite athletes have training, an outside job or sponsorship deal requirements. The most common and least invasive study is a survey method. Additionally, there are many subcategories of the athletic population, such as age, gender, sport, elite or college, and division—just to name a few.

So, how can we help the athletes we work directly with? Being informed about the effects that stress and anxiety can have on nutrition intake is a strong start. Recognizing the signs and symptoms, and being able to provide support and resources, whether it be informational materials about managing it or guiding athletes to others with more expertise, is another tool in the belt. It's a responsibility to stay current on current research in this area.

If you're an athlete and some of these descriptions sound familiar or common, it may be a sign to talk to someone. Managing stress and anxiety that appear with athletic events or persist will not only help athletic performance now but also in future circumstances throughout life.

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What Athletes Need to Know about Wellness and Anti-Aging Clinics

By The United States Anti-Doping Agency (USADA)

AUTHOR BIO:

The U.S. Anti-Doping Agency (USADA) is recognized by the United States Congress as the official anti-doping organization for all Olympic, Paralympic, Pan American, and Parapan American sports in the United States. USADA began operations on October 1, 2000, as an independent, non-profit organization governed by a Board of Directors. USADA was given full authority to execute a comprehensive national anti-doping program encompassing testing, results management, education, and research while also developing programs, policies, and procedures in each area.

There are an increasing number of health clinics that advertise to be anti-aging or wellness clinics, many of which provide compounded pharmaceuticals, herbal medicines, steroid hormones, unconventional treatment methods, and dietary supplements to treat various maladies.

While these therapies may seem routine or safe, it's important for athletes competing in sanctioned events, even those at the non-national or recreational level, to recognize that some of these treatments may be prohibited under anti-doping rules. Moreover, the various healthcare providers who work in these clinics may not be aware that their treatments are prohibited in sport.

Keep reading to learn more about wellness therapies in relation to anti-doping rules, and as always, make sure to check GlobalDRO.com or email drugreference@usada.org before using any medication.

Hormone Replacement Therapies

Many anti-aging or wellness clinics offer hormone replacement therapy (HRT) or bioidentical hormone replacement therapy (BHRT) as a method to treat natural changes that occur with aging, such as menopause in women or decreasing testosterone levels in men. Hormones, including prohibited steroid hormones, may also be prescribed to address lack of stamina, improve bone density, and treat general fatigue or a number of other issues.

Many of the steroid hormones used in these therapies, such as testosterone and dehydroepiandrosterone (DHEA), are prohibited at all times under the World Anti-Doping Agency (WADA) Prohibited List and for all competitive athletes, including non-national, junior, recreational, and masters level athletes. The prohibited status of testosterone and DHEA does not depend on whether the substance is natural, bioidentical, or synthetic. They are still prohibited regardless of how they are manufactured, marketed, or used.

Your health provider might tell you that testosterone or DHEA are not considered performance-enhancing drugs if they are only bringing your hormones back to their normal level. However, the use of testosterone or DHEA in any amount and regardless of the route of administration is

prohibited under anti-doping rules unless you have an approved Therapeutic Use Exemption (TUE).

In most cases, hormone replacement therapies involve taking tablets, using creams or patches, getting injections, or having pellets (pellet therapy) or other slow-release devices implanted under the skin. If you are prescribed a hormone replacement therapy, it is essential that you understand exactly what is in your medicine.

Medical Weight Loss

To assist with weight loss, some wellness clinics prescribe the stimulant phentermine, which is prohibited in-competition.

Another commonly used medication for weight loss is human chorionic gonadotropin (hCG), a hormone prohibited at all times in males. Even though hCG is not prohibited in women, female athletes should still be cautious. According to the Food and Drug Administration (FDA), hCG is approved as a prescription drug for the treatment of female infertility, but it is not approved for weight loss. In fact, the prescription drug label notes there "is no substantial evidence that it increases weight loss beyond that resulting from caloric restriction, that it causes a more attractive or 'normal' distribution of fat, or that it decreases the hunger and discomfort associated with calorie-restricted diets."

Even though it is not approved for weight loss, some doctors choose to prescribe hCG for that purpose anyway. Keep in mind that hCG is not approved for over-the-counter sale for any purpose and it is illegal to sell hCG as a dietary supplement or homeopathic medication.

> Stem cell injections are prohibited if the product is modified in a way that can offer performance-enhancing benefits.

Intravenous (IV) Infusions of Vitamins or Saline

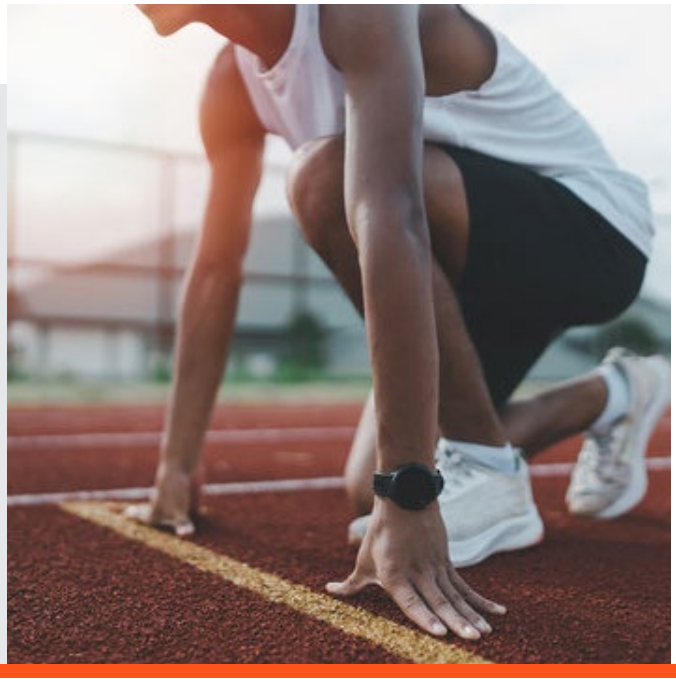
Some wellness clinics offer intravenous infusions of vitamins (sometimes called Meyers cocktails) that might be advertised as "boutique," "concierge," or "hang-over cure" IV infusions. They might even offer mobile or "ambulatory" IV infusion units that will come to your hotel, home, or other location. All intravenous injections of more than 100 mL in a 12-hour period are prohibited at all times, regardless of what is in the IV bag.

The only exception is if an IV is legitimately received in the course of hospital treatment, surgical procedures, or clinical diagnostic investigations. For the purpose of anti-doping rules, wellness or anti-aging clinics are not considered a hospital setting.

Ozone Therapy

Ozone therapy, a treatment that introduces ozone into the blood stream, can be conducted in a number of ways. With one type of ozone therapy, blood is removed from a vein, infused with ozone, and then reinjected back into the body. This method of ozone therapy, called autohemotherapy, is prohibited at all times. While ozone itself is not prohibited as a substance, all treatments that remove and reintroduce blood into the circulatory system are prohibited.

Ozone therapy can also be performed through rectal insufflation, where ozone molecules are generated and passed into the colon through a catheter. Ozone therapy by rectal insufflation is permitted.



> There are no FDA-approved homeopathic remedies and such products reach the market without any FDA evaluation of safety or effectiveness.

Compounded Medications

Wellness and anti-aging clinics often prescribe or custom-make individualized medications for each patient, which requires that a compounding pharmacy mix the product.

Athletes who have a prescription for a compounded medication or a compounded supplement should be aware that compounding pharmacies have additional risks for athletes. Compounded products are more likely than prepackaged prescription products to be contaminated because they are mixed by hand on workbenches where prohibited substances are often mixed as well. With compounded products, there is limited regulatory enforcement.

Adrenal Fatigue Therapies

In recent years, wellness clinics have started diagnosing a condition dubbed "adrenal fatigue," which they treat by prescribing oral cortisone that is prohibited in-competition.

Dietary Supplements

Dietary supplements are regulated in a post-market fashion, which means that no regulatory body approves the accuracy of the label or safety of the contents before they are sold to consumers. As such, no dietary supplement can be guaranteed to be 100 percent risk-free. If athletes choose to use supplements despite the risks, USADA has always recommended that athletes use only dietary supplements that have been certified by a third-party program that tests for substances prohibited in sport. USADA currently recognizes NSF Certified for Sport® as the third-party certification program best suited for athletes to reduce the risk from supplements. Visit USADA's NSF Athlete Advisory for more information on how to reduce your risk from supplements.

Stem Cell Therapies and Orthobiologics

Anti-aging or wellness centers may also offer a variety of stem cell or other orthobiologic treatments. Most commonly associated with sports injuries, orthobiologics are biological substances used to speed the healing process for musculoskeletal injuries.

According to the WADA Prohibited List, "stem cell injections may or may not be prohibited, depending on how the cellular material is manipulated or modified for use." In most cases, stem cell therapy is permitted if no prohibited substances are added to the material and the stem cells are locally applied only to the injury with no intent to enhance performance. Stem cell injections are prohibited if the product is modified in a way that can offer performance-enhancing benefits. Click here for more information.

Homeopathic Remedies

There are no FDA-approved homeopathic remedies and such products reach the market without any FDA evaluation of safety or effectiveness. Through testing, the FDA has later identified some homeopathic products that contain active pharmaceutical ingredients, as well as products that are unsterile or otherwise unsafe. Please see the FDA consumer advisory for more information.

Because homeopathic medications are manufactured and sold without strict pre-market review, USADA is not able to guarantee that the labels are accurate and therefore cannot provide an anti-doping status for homeopathic medications. Homeopathic remedies, like supplements, are used at the athlete's own risk.

Even when a treatment is prescribed, athletes should check on the anti-doping status of any procedure or medication and determine if they need an approved TUE. For questions about specific products, substances, and methods, contact USADA's Drug Reference Line at drugreference@usada.org or call (719) 785-2000, option 2.

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