Dan Seed:

Hello and welcome to Big Ideas, a podcast from Texas State University in San Marcos, Texas. I'm your host, Dan Seed, from the School of Journalism and Mass Communication. We're joined this month by Dr. Matt McAllister, an assistant professor in the Department of Health and Human Performance. Dr. McAllister is here to discuss the work that he's done in studying intermittent fasting. Among his other work is those with folks in high-stress occupations, think police and firefighters, to help mitigate the physiological effects of stressors. So Dr. McAllister, thanks so much for joining us.

Dr. Matt McAllister:

Absolutely. Good morning. Thanks for having me. I'm excited to be here. I appreciate the opportunity.

Dan Seed:

So how'd you get into this? What drew you to health and human performance as an area of study?

Dr. Matt McAllister:

Well, actually, initially, growing up, since I was about 15 years old, I was just addicted to exercise, training and dietary interventions and figuring out ways that we can manipulate the diet for our training approach to achieve things like improvements in body composition, improvements in performance. I was always interested in dietary supplementation and different diets like the keto diet and whether or not it works. And it blew my mind because, as an undergraduate, I didn't even really realize the possibilities of what you can do as a PhD. So once I learned that you can actually be an expert in that area, it was amazing.

Dr. Matt McAllister:

And so no question about it. I knew what I wanted to do when I was about a senior for my undergraduate program in exercise science. And then I did some work with some fantastic scientists at the University of Memphis, Brian Shilling, who in now at UNLV Las Vegas, Nevada, and Richard Bloomer, and they got me into this type of research and looking at how we can manipulate training and dieting to improve performance and getting me exposed to how to actually do these studies to answer those types of questions.

Dan Seed:

So a true passion for you going back to when you were younger.

Dr. Matt McAllister:

Yeah, it's a personal thing for me because I've always loved exercise science. And actually, when I started at a community college early on, I didn't even really know you could study that in college. I started studying computer science because I thought, hey, that's where the money's going to be, technology. I just didn't love it. And once I realized that you could study this and be an expert in this area, I was totally amazed. And going back, I wouldn't change a thing.

Dan Seed:

So let's get into intermittent fasting. And we've heard a lot about it in recent years, especially with celebrities, right? Talking about it, posting about it, folks like Jennifer Anniston, Hugh Jackman, Tom Brady, they all swear by it. So what exactly is it?

Dr. Matt McAllister:

Intermittent fasting itself really is an umbrella term. Intermittent fasting is a broad term that encompasses a number of different fasting approaches. Time restricted eating, or time restricted feeding can be one of those approaches, but there's all kinds of different ways to fast.

Dr. Matt McAllister:

The time restricted eating in intermittent fasting came from Ramadan, which is a religious form of fasting, and there's a number of different approaches, for example, alternate day fasting, where some people would fast for three days out of the week, and the other four days of the week, you're eating a normal diet. But for those three days that you're fasting, you might be on a very hypo caloric diet where you're only consuming 300, 400, 500 calories a day. So technically that type of alternate day fasting is you're kind of fasting every other day or maybe only a couple of days a week, something like that.

Dr. Matt McAllister:

So intermittent fasting is a broad term, again, that includes a variety of approaches. The approach that I think is most common and most popular is time restricted eating or time restricted feeding. It's really the same thing. And that's where you follow a set program each day, which typically includes a standardized or consistent feeding or eating window. And the most popular is the 16/8 approach, where you have 16 hours of fasting followed by eight hours of eating.

Dan Seed:

Let's talk a little bit about the study that you conducted. It's been touted as a weight loss deal, reduced BMI, and you guys found that, but you also found hidden benefits beyond just the physical transformation that happened. Discuss that a little bit.

Dr. Matt McAllister:

Oh, I'm excited that you pointed that out because a lot of times people forget about those benefits that are independent of weight loss. And that's important for everybody because a lot of people, almost everybody, at least know someone that has an interest in losing weight or improving body composition. And that's what people want to do, is they want to get more fit a lot of times. Well, it's very frustrating when you start a training program if you work your butt off for a whole week or two weeks and you don't see any results. The scale is not moving. It's frustrating, right?

Dr. Matt McAllister:

Well, you have to remember that first of all, it's going to take time before you start to see those results, but there are a lot of benefits that are independent of weight loss. So weight loss may be one of those factors that you see, body fat loss may be one of those things that you see, but there are also factors that are independent. And what we do is, yeah, we look at the body composition, we look at body fat percentages, but we also take blood and sometimes saliva samples, and we can look at biological or biochemical markers of inflammation, oxidative stress, and traditional markers of cardiometabolic health.

Dr. Matt McAllister:

And one thing I wanted to throw out there that your question raised this idea for me is something that I wanted to mention. The first study that we did is published in a journal called Nutritional Research. And the reason I did that initial study is because there were these preliminary, I shouldn't call them preliminary, but there were some earlier findings where studies where being done in rodent models where they would do intermittent fasting or time restricted eating and they were finding pretty dramatic improvements in body composition in rats.

Dr. Matt McAllister:

My thought was, okay, if you're going to lose body fat doing intermittent fasting, it's probably because you're just eating less calories. So let's say you're going to adopt the 16/8 protocol, and so you're only going to eat eight hours a day, you're only going to eat from 9:00 AM until 5:00 PM, and outside that eight hour window, you're only going to consume beverages that contain almost no calories, black coffee or water, things like that, my thought before starting this was if you follow that protocol and you do lose weight or lose fat, it's probably going to be due to the fact that you're just eating less calories. Because the overwhelming majority of the research shows that no matter what diet it is that you do, if it's low carb, if it's keto, if it's fat restriction, whatever it is, the most successful approach is to put your body into an energy deficit state and eat less calories or burn more calories.

Dr. Matt McAllister:

So my thought was it's that simple. You follow a 16/8 fasting feeding protocol, you're going to lose weight or lose fat because you're just eating less calories. So what we did for that first study is we tested that. We took two groups and one group was an ad libitum feeding group. And what that means is eat as much food as you want, eat until you're satisfied, but follow the 16/8 fasting feeding protocol. So we didn't restrict how much food you're eating. You can eat as much as you'd like, but make sure that you're limiting the time of eating to that eight hour window each day.

Dr. Matt McAllister:

The other group was an isocaloric group. And what we did for that group was look at how many calories they're consuming before the study started. We analyze the total caloric intake, the amount of calories they were taking in before the study started, and we asked them to eat the same amount of calories throughout the study.

Dr. Matt McAllister:

So we had these two groups, one group eating as much as they'd like, and the other group eating the same amount of calories that they were consuming before the study started. Both groups followed that 16/8 fasting feeding protocol. I really thought that the group that ate the same amount of calories would maintain body weight and the group that was allowed to eat as much as they'd like, I figured they would lose more fat because they're not trying to eat as many calories as they're used to. And we actually, anecdotally, we noticed just from some informal feedback from the subjects that the group that was trying to eat their normal amount of calories, they were saying it's hard to get this much food in that eight hour window.

Dr. Matt McAllister:

But no, both groups actually experienced significant reductions in body fat, blood pressure. We found increases a beneficial cytokine called adiponectin, which is something that helps your body burn fat and burn glucose. And we also found an increase in HDLC, which is identified as the good cholesterol in both groups. So that was kind of shocking. And because of those results, I continued on and did a couple more studies.

Dan Seed:

What was your takeaway from that? When you saw these two groups both lose weight, what does that tell you about this in terms of the way that it works or the way that it affects our bodies?

Dr. Matt McAllister:

I don't draw a strong conclusion based on one study. I'll be honest with you, I don't draw strong conclusions. What it told me is there's something here. And in fact, I had done a number of studies before that one in particular, and this fascinating study actually produced some of my most strongest results, because in terms of the changes in the markers that we collected, I was kind of shocked at how many of those markers actually did improve for both groups. So what it did for me is it really solidified, hey, that there's something here, let's at least continue studying it.

Dr. Matt McAllister:

And what I did from there is I carried it over to firefighters. I do a lot of work with firefighters, law enforcement as well. And when you think about a firefighter, most people think about how they're under a lot of physical stress because you have a structural fire. And what happens when you respond to a structural fire, you have the added gear, you've got the air tank, the SCBA, which is the self-contained breathing apparatus. You've got all that PPE. So the added weight and the added physical stress, and that's what most people think about when they think about the life of a firefighter or at least a typical structural firefighter.

Dr. Matt McAllister:

But what you see in those individuals is they're exposed to a lot of psychological stress. They're exposed to a lot of inconsistencies in their daily habits because they don't have a consistent sleeping pattern. They don't necessarily have a consistent eating pattern. You might go to bed at 9:00 PM and wake up two hours later with a structural fire that you got to respond to and it's a serious event, and you go home a couple hours later, you can't sleep.

Dr. Matt McAllister:

And so there's a lot of things that act as stressors in that occupation. And actually for a number of reasons, we thought time restricted eating would be a highly beneficial dietary intervention for them. One of the reasons is because they don't have a consistent sleeping and feeding pattern or eating pattern. I wanted to at least do some preliminary work before I go to the fire department because I can't go to a fire department and say, "Hey, let me do some research with you." I have to at least have something to show.

Dr. Matt McAllister:

And so I said, "Hey, look, we've done this before and it gave us some benefits." A lot of firefighters are interested in those types of dietary approaches and dietary supplementation. So they were actually really onboard with it. And we brought it to the fire department in Lake Travis. And for our follow-up study, this has just got accepted for publication in the Journal of Strength Conditioning Research, we did a six week time restricted eating protocol with those individuals and looked at a very large panel of blood markers. We analyzed well over 40 markers here in our lab, which is the MAP Lab, the Metabolic and Applied Physiology Lab in the Health and Human Performance Department. We looked a very large panel of blood markers. I believe it's by far the largest panel I've ever done. And we found reductions in some very meaningful markers of inflammation and oxidative stress, which actually has some potentially impactful implications in terms of cardiovascular disease risk.

Dr. Matt McAllister:

And that's important for firefighters because a lot of people don't realize that firefighters have an elevated risk for developing heart disease. And that's a main reason I study that group. It's actually between 45, some numbers are now showing as much as 50% of all deaths in that occupation is attributed to a heart attack or stroke. And so that's really a primary focus for me.

Dan Seed:

So when you get these results, right, from that first study that showed improvements in cardiovascular health, those markers, and then you see it with the firefighters here, I know that as you said, it's hard to draw conclusions, but what can you infer from that in terms of how this or why this might affect the body in such a way internally to create those kinds of improvements?

Dr. Matt McAllister:

In terms of why, there are a couple of different hypothesized mechanisms or suggested mechanisms that this might be working. One individual that comes to mind that does a lot of work studying mechanisms is Dr. Panda at the Salk Institute in California. And he studies the circadian rhythm, circadian clock.

Dr. Matt McAllister:

Essentially, without going into a lot of detail in that mechanism, essentially, it's kind of like this. You know that we have kind of the sensors in our brain that respond to changes in light. So when the sun rises in the morning, we have a hormonal response in the body that triggers hormones to wake you up, make you feel more alert, and the same thing happens or a similar thing happens when you're exposed to darkness.

Dr. Matt McAllister:

Well, not only do we have this type of clock in our brain, but we also have peripheral clocks in the body. So for example, the liver has a clock. And if you can synchronize that brain's clock with, for example, the liver's clock, what happens is there appears to be ideal times of the day to consume calories. There appears to be, I'll say, ideal times of the day to consume calories. For example, some work shows that it's best, if you're going to do this type of fasting, to eat your calories earlier on in the day, as opposed to later on at night. What that would mean is start your feeding or eating window earlier, maybe 8:00 AM or 9:00 AM, as opposed to starting it later in the afternoon.

Dr. Matt McAllister:

Because what happens is there are enzymatic changes in the body. There are enzymes that function or tend to function better earlier in the morning and not as good later at night. So if you're eating later at night, those enzymes aren't going to function as well. And if they're not functioning well, you've got a greater likelihood of starting to synthesize or develop more fat in the body, which can lead to body fat, but it can also lead to increases in blood levels of fats, which are triglycerides, and there are a number of things.

Dr. Matt McAllister:

But another mechanism that comes to mind, which is interesting, when I started working at the Cardio-Respiratory Metabolic Lab at the University of Memphis as an early graduate student, I started getting into caloric restriction or at least got exposed to some caloric restriction research. And I will say this, it appears to be that very interesting things happen when you put your body into an energy deficit state. So you can put your body into an energy deprived state in different ways. You can do high intensity exercise or just pretty good intensity, longer duration exercise. You can practice moderate caloric restriction. You can practice some form of fasting.

Dr. Matt McAllister:

When you put your body into an energy deficit state, there are also some interesting things that happen that have an impact on overall cardio metabolic health, and possibly those benefits might translate to improved exercise performance and improve metabolism during exercise, meaning you might actually burn more fat during exercise, which would be an ideal adaptation.

Dr. Matt McAllister:

It's really fascinating when you look at the research that shows changes in those enzymes that are dependent on energy deficit. Because one enzyme that comes to mind is called AMPK, adenosine monophosphate-activated protein kinase. When you go to an energy deficit state, again, if it's a good amount of exercise, if it's mild caloric restriction or possibly fasting, AMPK is increased, and this enzyme really helps you burn fat and burn glucose. And that's a very ideal thing for possibly endurance exercise performance, for preventing type 2 diabetes. Because that's one problem with type 2 diabetes is you have had trouble burning that glucose. And in people who have metabolic syndrome, they have a hard time metabolizing fats during exercise too.

Dr. Matt McAllister:

So in terms of mechanisms, it's hard to really nail down one, but at this point, I'm interested in these findings and it appears that some really fascinating things are occurring. We really just need more research to nail down or pinpoint a solid mechanism or a couple of mechanisms as to what's going on in the body.

Dan Seed:

So it sounds like, I mean, this sounds like it's a relatively new field of study or area to explore. So you're at the forefront of looking at this and there's a potential for great longterm effects with folks with cardiovascular disease, it sounds like, and in athletes as well, professional athletes even.

Dr. Matt McAllister:

Absolutely. Yeah. The earlier work that was done five, six years ago was predominantly in animals or rodents. I don't want to say we were the first, but we were among the first to do well controlled trials in human populations. There are other individuals that are doing those trials, but yes, it certainly is in the early phase right now. And I think you'll see more research going on in the near future because of the promising results that have been coming out, really interesting results.

Dan Seed:

So how exciting is that for you, to be at this point and to be at that forefront, that beginning of this kind of research and playing a role in that?

Dr. Matt McAllister:

It's exciting, but to be honest with you, it's a little difficult too, because you do a study, and even though a study produces interesting or meaningful findings, it's only one study and you have to keep that in mind because one study is not going to solve all the problems and one study doesn't give you solid answers. Every study has limitations. So it's exciting and it definitely is somewhat rewarding, but you just have to keep in mind that just a lot more needs to be done before we have really solid answers about this.

Dan Seed:

So for people that are interested in maybe doing this, again, a two-pronged question. One, this sounds more like a regimen and less like a diet, and two, what are some of the initial effects that people face? Because I can imagine that's a big transition, to adjust your eating habits in such a way. What are people showing when they first get into it, and then how long does it take for maybe like a malaise or something like that to subside to where energy levels increase and maybe headaches go away? I don't know if that's one thing that you've seen, but when you change your habits, oftentimes that'll happen.

Dr. Matt McAllister:

I've seen, just from talking to individuals enrolled in our study, we've talked to a lot of people about how they feel when they start the diet and things like that. First of all, kind of a biased population when you study firefighters because often they might go extended periods of time without eating anyways, just because of the lifestyle. But some of the reports that we heard were after that fasting window is over, when I eat my first meal, I feel like I'm eating a lot of food. I feel like I'm trying to make up for that meal that I missed earlier. So that's one thing.

Dr. Matt McAllister:

You do experience that hunger if you're doing fasting, if you're going to start fasting at night and fast throughout the evening. That's something that you tend to get used to after just a couple of days. I started intermittent fasting because if I'm going to study it, I've got to experience it myself, and it just wasn't for me. It's not for everybody. It wasn't for me. I preferred to fast a little bit into the morning. So I wouldn't eat my first meal until about noon or so. And this was before the studies came out showing that it was actually best to eat your food or meals earlier in the day.

Dr. Matt McAllister:

I would fast until about noon or so and I would go and do my workouts in the morning. So after a couple of days, for me and for others, you adapt really well. This actually was kind of liberating for me because I had been doing a lot of resistance training. And if you study a lot of the resistance training research, they show that if you want to build muscle, you want to eat every three to four, maybe five hours. You don't really want to go prolonged periods of time and fasting because that could be detrimental to your gains or your muscle mass.

Dr. Matt McAllister:

And this approach actually was really liberating to me because I realized you can fast for 15, 16 hours or longer and you're not going to lose muscle. Your body's going to produce energy from other sources. So that was actually really rewarding for me, to realize I don't have to eat every few hours. I'll be fine.

Dr. Matt McAllister:

For me, that the problem was I would go now do my workouts fast. And for me personally, lifting weights wasn't a problem, but it was when I was doing endurance exercises, prolonged endurance exercises outside in the heat. I was doing a lot of cycling outside and I would go and do a two hour ride in the heat. And I would hydrate as well as I could, but I was coming home and feeling lightheaded, even though I was hydrating as well as I possibly could.

Dr. Matt McAllister:

And it was probably still a hydration issue. There was also, for me, my blood pressure dropped pretty low. It does tend to reduce your blood pressure. So you would want to monitor your blood pressure. For me, my BP stays around like 110, 115, and when I'd be fasting, I would take the blood pressure and it would on some days be less than a 100, systolic blood pressure.

Dr. Matt McAllister:

So it's not for everybody and it certainly is a lifestyle. And that's the thing, it's like, as you pointed out, it's a lifestyle approach and there's no best diet for everybody. It's worth trying if you wanted to do it, but it's not a blanket approach. I hope that answered your question.

Dan Seed:

No, it sure did. And I think that that's interesting too, what you're describing, especially when you're talking about working with firefighters, people that are under that kind of stress that are physical all day, to be able to maintain that level of physicality and health and wellbeing as they go through their jobs. Athletes, the same thing.

Dan Seed:

So lastly, what are you working on now? Give us some insight in what's next for you.

Dr. Matt McAllister:

We just analyzed and released our last firefighter study. And what we did is after we saw the fasting blood markers improve in those firefighters, we found those reductions in inflammation and oxidative stress markers, we ended up deciding let's put them under stress. So let's have these firefighters put on full gear and actually do a simulated what we called fire grounds challenge. So we had them on air in full gear in the heat and doing a simulation of different tasks where there were things like a ladder carry, a victim removal task where they would have to drag a very heavy dummy, 165 pounds of dead weight. They did a forced entry task where they would have to, with a mallet, move a steel beam, pounding it, sledgehammer, tight fashion.

Dr. Matt McAllister:

So a simulation of fire specific types of activities that was actually a maximal intensity challenge. We had them do that before and after eight weeks of fasting. And we actually found that the stress response to that type of challenge was significantly reduced. Cortisol levels were significantly lower after that fire grounds test after fasting, and we also found reduced inflammation. So that was a very recent finding.

Dr. Matt McAllister:

And currently, right now what we're looking at is a slightly different aspect. It's not really related to dietary interventions. That would be something in the future. What we're doing right now is looking at virtual reality type training for firefighters and law enforcement officers, and trying to determine if virtual reality type interventions can be as effective or perhaps more effective than a traditional training intervention for firefighters and law enforcement individuals. We're looking at the biochemical stress response to VR training interventions.

Dan Seed:

So before we go, anything else that you'd like to add or touch on before we close the show?

Dr. Matt McAllister:

Yeah. The number one thing, anyone that's considering a dietary or a training intervention, you can't put a lot of weight behind one study or two studies that have been done. You should consider the findings. And if you feel like that approach is something that might work for your lifestyle, give it some consideration, but also keep in mind that there's no one size fits all approach when it comes to dieting. Same thing with training. You just have to find something that works for your lifestyle.

Dan Seed:

All right. Dr. Matt McAllister, thanks so much for joining us.

Dr. Matt McAllister:

Hey, thanks for having me. I enjoyed it.

Dan Seed:

Yeah, a lot of fun. A lot of interesting stuff, a lot of interesting studies that you're working on, and we'll be sure to follow up with you at some point and bring you back on to discuss what you're finding because it's really informative and informational.

Dan Seed:

So for our audience out there, thanks so much for joining us. Be well, stay informed, and we'll be back with you next month here on Big Ideas.

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