LSUHS Podcast: Can We Predict Heat Illness Before it Happens?

Audio	Video
Mark Klein: High school football. You can just picture it: bright lights, marching bands, cheerleaders, the whole community coming together just to watch a game. But before the Friday night lights turn on, those players spend hours practicing, preparing, perfecting every play. And in Louisiana, they do it during the hottest time of the year, a scorching Louisiana summer. But the thing is, heat-related illnesses, well, they're the most common preventable injuries among high school athletes. And that inspired the researcher that you're about to meet to ask a very important question: How can we keep these kids safe? Our next guest is an associate professor and chair of rehabilitation science at LSU Health Shreveport. He's also an associate professor of family medicine. His research is focused on heat stress, how it impacts the body, how it impacts the brain. And he's performed studies with firefighters and pilots at Barksdale. Now he's continuing that work to keep our local high school athletes safe. Making his LSU Health Shreveport Podcast debut, Dr. Cory Coehoorn. Glad to have you on the show. **Cory Coehoorn:** Thanks for having me.	Mark and Cory Coehoorn, PhD, Interview in a Television Studio

Mark Klein:
All right, so let's jump right in and talk about what you've been working on the last couple of weeks.
Cory Coehoorn:
We identified among firefighters years ago that, obviously, these individuals are heating up very, very rapidly. They're dealing with excessive heat stress.
And so we've really spent a lot of time over the last few years looking at firefighters. How does the heat stress impact the body? And we started to develop algorithms for how we can predict core temperature in order to maybe put something into a wearable that can be used to monitor these people and then pull them out of a situation when it becomes dangerous.
Well, the next logical step was to move to other populations. And as you start reading through literature, diving into high school football players, football in general, you start to realize that, especially here in the South, there is a serious problem. And there are kids that die each year from heat-related illness in sports.
A lot of those kids that have died over the last several years from heat-related illness are high school football players. And it has to do with resources. It has to do with lack of education. It has to do with a lot of things. But the bottom line is these kids just get hot, and they get hot quickly, and they get dangerously hot.
And so, if we can figure out a system, which is what we're working on, to monitor these kids, pull them out before they reach detrimental points, I think we're going to be ahead. Because how they do things now is reactive. You see a kid on the sidelines, you see a kid on the field who's dealing with cognitive-related issues, maybe throwing up.
At that point, a lot of times it's too late. You have to get them in an ice bath. You have to get them to an emergency room, go through that. So the whole premise of this type of research is: Can we pull them out, get them cool before they get to these dangerous points?
Mark Klein:
All right. So let's give them the nuts and bolts of it. What does the research actually look like? You mentioned wearables. Talk me through what's collected.
Cory Coehoorn:
Yeah. So what we do is we collect a bunch of different things. We collect all kinds of physiological metrics. Think heart rate, breathing rate, skin temperature, things of that nature that can be collected from a wearable.
We also collect environmental variables: wet-bulb globe temperature, humidity, wind speed, all these different pieces as well. And what you do is you take all those metrics and you figure

out, using algorithms, how well those metrics predict actual measured core body temperature.
And we actually have them swallow a core-temperature capsule, which directly measures it. So we have the actual measured variable. We have the predictive metrics. And we can actually use algorithms with these to predict what this is. And then ultimately, you take the pill out of the equation and you just have the wearable.

Mark Klein:
A sensor like that, is it impacting their ability to play? Is there anything there?

Cory Coehoorn:
No. So we use an armband sensor. It just sits on their upper arm. It doesn't impede anything. That's a great question.
I remember years ago going into a fire hall, and at the time we were using what was almost like a chest strap. It almost kind of resembled a sports bra kind of thing. And the firefighters said, "I mean, that's all great, but I don't want to put that on every day."
And so we've worked through some things, and I work with a company, and we're working on a solution. And actually, that company has come up with an armband solution. So that armband now just sits on the upper arm.

Mark Klein:
Okay. I mean, at the end of the day, to me it's about being accessible, right? If you have this kind of technology, hopefully it's something that is relatively affordable for these teams. This transcends just the research here. Ideally, I imagine you want to see this in high school athletes across the country, especially here in the state.

Cory Coehoorn:
Yeah. The goal is to get this out there. The goal is to get this preventative system to all different populations.
We actually just got another grant for a study where we're going to look at agricultural workers and construction workers, two other groups that are definitely susceptible to heat illness as well.
So the goal is to get a whole bunch of data, because these algorithms predict better when they have a ton of data. So the more data we can get, the better we're at it, the more accurate our algorithms will be, and then we deploy them out.

Mark Klein:
So you mentioned just now grants, right? So this is being powered by something called the Collaboration in Action Program. Big word there, collaboration. It's not just you. It's a team of people across the state. Talk about how that all works together.

Cory Coehoorn:
Yes, we have a bunch of people involved in this project. So there's

myself. There's Dr. Peter Seidenberg, the chair of our Family Medicine Department, Dr. Miguel Lopez, who's out in Monroe, Dr. Travis Curry, who's down in Baton Rouge. I've got my PhD student, Joshua Fortenberry, on it as well.

There's a lot of us working together in order to move this thing forward because it is so important.

And you want to have researchers like me involved, but then you want to have the physicians involved as well, because they're on the field. They're the ones who are dealing with the athletes. They know what is useful for them, what is not useful for them. So getting as many of these people involved is definitely beneficial.

Mark Klein:

At the time we're taping this, relatively early September, football season is really just kind of kicking off. Fans are in stands watching games. At the same time, research is just kicking off. Field work is just kicking off.

What's been the response so far from the players, from parents, from coaches? What are you hearing?

Cory Coehoorn:

Yeah, it's been great. The kids want to be involved. The athletes, the parents want their kids involved, the coaches want everyone involved.

Obviously, there are logistical things you need to get past, approvals and things like that. We've gotten past all that stuff, so we're ready to get on the field. We're getting consent forms back now from parents for their kids. So we're ready to get going.

Mark Klein:

What do you think about this mentality of "heat builds toughness"? When you think about athletes in Louisiana, it's not just unique to us. Anywhere in the South, really. And part of that is conditioning.

Cory Coehoorn:

Yeah. I mean, I played high school football. I played football in college as well. And that mentality was definitely a thing. And on top of that, it was the "water makes you weak" kind of thing.

And so we'd be thinking, "We need a water break. We need to get off the field." The coach would look at you and say, "Water makes you weak."

Well, that type of mentality is incredibly dangerous. And I don't know how much of that we see anymore. I think coaches, athletic trainers, team doctors, they recognize the danger of the heat, the need for the water. But there still is probably a little bit of that mentality of, "Hey, tough it out," kind of thing.

And if you don't have knowledge of heat stress, if you don't have knowledge of heat illness, you may think, "Yeah, this kid's just being weak," or, "This athlete is just being weak."

The reality is, and that's the importance of this research as well, heat stress targets individuals differently. Just because one athlete is fine does not mean that another athlete is fine.
There are body composition issues. There are acclimatization issues. There are all kinds of different things at play. So just because one kid or one group of athletes is doing fine doesn't mean that another individual saying, "Hey, Coach, I need a water break. I need to get off the field," shouldn't be paid attention to.

Mark Klein:
You mentioned heat illness impacts different people differently. Is there a particular group that's more susceptible than others?

Cory Coehoorn:
Athletes who are not acclimated. Meaning, let's say you have not been out in the heat very much over the course of the summer break. All of a sudden, you get back on the field and you jump right in.
A lot of teams now are going through acclimatization procedures in order to get their athletes acclimated, especially the bigger high schools. They're on top of that. But you don't want a kid just jumping in after not being out in the heat. The most acclimated people are the people who are consistently out in the heat.
Another thing, too: people who have high body fat percentages, they're also at risk as well. So the bigger offensive linemen, defensive linemen, people like that, they're larger individuals. They're more susceptible to heat illness.

Mark Klein:
Where are the places that you guys are doing field work?

Cory Coehoorn:
Yeah, we're going to be down in Baton Rouge. We're going to be in Monroe. We've got some high schools around town here that are also highly interested. Potential to go even further south, maybe to Houma as well.
So we've got a lot of different groups that we're working with right now, reaching out to them, they're reaching out to us. Some really, really concrete groups that we are probably going to start collecting data on next week.
But yeah, we're trying to cover a lot of the state.

Mark Klein:
As I think back on your research journey, starting with working through firefighters, working with Barksdale pilots, now with our athletes here in Louisiana, where did that desire to really look into heat stress come up?

Cory Coehoorn:
Yeah, it's really odd. I'm actually originally from Canada.

Mark Klein:
I was going to say, that's true!

Cory Coehoorn:
So it's odd that someone from Canada would be interested in heat stress. But the bottom line is, I did my PhD at the University of Victoria in British Columbia, and my PhD chair was doing work with firefighters at the time and was interested in how the heat stress that firefighters deal with impacted cognition.
And so my PhD project surrounded all that. It was: How does the rapid increase in core temperature that firefighters have because of the gear that they wear impact their ability to think?
So I kind of dove into that, and we started exploring: How does it impact EEG, or brain waves? How does it impact brain oxygenation? How does it impact decision-making?
And just sort of diving into that: How does it affect other physiological responses? Now we've gotten into how it impacts respiratory responses. How does it impact balance? How does it impact gait? How does it impact all these things?
Because another thing that firefighters deal with is slips, trips and falls leading to injuries.
And so another one of my colleagues, Dr. Erin McAllister, she's doing some work with balance and things like that with firefighters.
But bottom line is, I got into firefighters because my chair at the University of Victoria in British Columbia was working with firefighters already. I loved it so much that I've just kind of, year after year, gone down this path looking at answering questions that haven't been answered.
And now we're working with new groups, like I said, high school football players. Then we're going to be moving into agricultural workers, construction workers. The bottom line is, a lot of groups deal with heat stress. There are a lot of heat issues that people face, and ultimately we just want to help.
Mark Klein:
Well, let's talk about that. Agricultural workers, construction workers. What's the desire there? I mean, I know they're always out in the heat. The jobs they do are so important. It is a logical step. But explain to me how that might look different than what you're doing with the athletes.
Cory Coehoorn:
Yeah. So football players, firefighters, they wear a lot of gear. Firefighters are wearing their personal protective equipment, which covers their entire body. Football players are wearing a lot of heavy personal protective equipment as well.
Agricultural workers, construction workers, not as much. But what are the issues? For example, with agricultural workers, and in particular field workers, just like you mentioned, they're out in the heat for long periods of time.

I was outside doing yard work yesterday, and when I tell you, I couldn't believe how hot I got. I can't imagine being an agricultural worker, being out there all day long.
And the stats show construction workers and agricultural workers are two of the most susceptible occupations to heat stress and heat-related deaths.

Mark Klein:

So as we think back to this high school football study right now, you hear a coach be proactive, as you say, pulling the player, saying, "Hey, we're going to pull you out for a little while, let you cool off, come back into the game."
Hearing something about that, hearing it be successful, what would that mean to you?

Cory Coehoorn:

It would be incredible. Because I know we'd be saving lives.
There are several situations, several different stories that have come my way. I've had organizations reach out. I've had parents reach out, parents of kids who have died from heat-related illness in this part of the world.
The ability to help them, the ability to prevent these types of deaths, these traumatic, life-altering situations… I cannot imagine losing a child for anything. I have two kids. To me, that would be one of the most devastating things I could possibly face.
So if we can prevent some of that, I mean, at that point, I feel like my research program has done something good. It's helped people. And ultimately, that's what we're here for, right?

Mark Klein:

Before we wrap up, going away from the football field, just for the layperson, maybe not an athlete, who may be outside working in the yard just like you said: What do they need to know if something doesn't feel right?
Sometimes you do have to be reactive, right? What should they be looking for in the event of illness?

Cory Coehoorn:

Bottom line is, be smart.
If you are not someone who spends a lot of time outside, be cautious. Make sure you go into that activity hydrated. A lot of people are walking around dehydrated, drinking a bunch of coffee, drinking a bunch of things that will act as a diuretic and actually dehydrate you.
You need to go into those activities fully hydrated, and you need to make sure you're taking breaks on a regular basis in order to make sure that you stay hydrated and stay cool.
And if you start to feel weird, get off the field. One of the issues with sport and one of the issues with work, the reason why these groups

are so susceptible, is that they don't come off for fear of what others will think. If you're working outside, you're gardening, you're taking care of your yard, just be smart. If you start to feel weird, go in the house. That last little bit of yard work can wait for another day or another time. Make sure you just pull yourself out when you need to. **Mark Klein:** Looking ahead five, 10, 15 years from now, for this project to be a success, what are you seeing? **Cory Coehoorn:** I see every high school kid, every agricultural worker, every construction worker, every firefighter having a wearable on them that tells them accurately how hot they are. And I see fire commanders, agricultural foremen and construction worker foremen. I see coaches and athletic trainers holding a tablet, monitoring each individual out there and saying, "Hey, player A, come off the field. I know you might not feel weird right now, but you're getting hot and you're entering into a dangerous zone." Have them come off the field. Keep them safe. Give them water. Give them a break. Yeah, I mean, that's what I see. I see this being deployed at work. **Mark Klein:** Well, one last thing I want you to do. Let's talk directly to coaches. You mentioned the stigma of the past, "water makes you weak," all these kinds of things. Obviously, a lot of that has gone by the wayside now in 2026. But at the same time, this can be considered a strategic advantage, right? Every coach is looking for a way to make their team better. One of those ways is to make sure your players are healthy. What would you want to tell them about this particular research and what it could mean for their teams? **Cory Coehoorn:** One of the beautiful things about this type of research is it's not a global thing. Meaning that if player A and player D are extremely hot, we can pull them off individually and keep the other players out there practicing. Because one of the things that coaches, foremen, you name it, are concerned about is, one, getting the work done. Number two, getting the practice in so that they'll be successful on the weekend. If we have an individualized approach, we can pull off specific players, keep the practice going and make sure that everyone stays healthy. So instead of shutting down the entire practice, you could pull off individual players and keep things going. Because the reality is,	

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some of the players on the field might not be at risk at any given moment. **Mark Klein:** Great work. Appreciate you stopping by today. To learn more about this research, there's an article on our website in the newsroom section of LSU Health Shreveport.	
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