

Banner Health | Myocarditis_1

Early on in the COVID crisis we began to recognize in sports medicine athletes that had experienced COVID-19 and later resulted in having cardiac symptoms and found to be myocarditis, or inflammation or infection of the heart.

We know in sports medicine that when you look at causes of sudden cardiac death in sports, even before COVID, 20% of episodes of sudden cardiac death are from myocarditis. And there's other viruses that cause myocarditis. But now, with COVID-19, it seems to have a predilection for causing a robust inflammatory response or infection of the myocardium and the pericardium.

So a lot of studies have been-- the medical community has scrambled to do a lot of studies. And when you look at some of the evidence, people that are significantly sick and hospitalized for a significant period of time with COVID-19, it may be up of 60% to 70% of them have evidence of myocarditis or pericarditis as part of their disease.

The reason that the PAC 12 and the Big Ten delayed their football season is because of some research done out of the Big Ten that showed that their athletes that had recovered from COVID-19 utilizing cardiac MRI, somewhere in the realm of 10% to 15% of their athletes had evidence of infection or inflammation of the heart.

And knowing that that's a significant cause of sudden cardiac death in athletes, alarm bells went off in the sports medicine community as to what needed to be done and to make sure that we screen athletes appropriately after they're infected with COVID-19 trying to prevent long-term damage to the heart and to prevent episodes of sudden cardiac death.

Being one of the team physicians for the Phoenix Suns, being on the medical advisory committee for Major League Baseball, and being on the medical advisory committee for Arizona Interscholastic Association, I have access to a lot of data on various professional and college and high school athletes.

So I wanted to partner-- I wanted to put out the right answer of what we as an institution and Banner Health should be doing that made sense. Because if you look at the Big Ten in studies, those were with cardiac MRI. But there is a high incidence of false positive rates with cardiac MRI because it's so sensitive. And we didn't even really know what the findings on cardiac MRI really need. And if they're not in the right hands, you're going to hold out athletes unnecessarily.

We also can't access cardiac MRI for every club, sport, high school, college, professional athlete in the world after they have the COVID-19. We would completely overwhelm the health care system at a time when it's already overwhelmed with actually treating people that have significant COVID-19 infections and may have life-threatening COVID-19 infections. Just to play sports, we didn't want to somewhat steal from people that really need it.

So I partnered with primary care sports medicine doctors, pediatric and adult cardiologists within the Banner Health System, and we pooled together a working group of about 10 of us to develop an algorithm that-- based on the American College of Cardiology recommendations and based on our personal experiences made the most sense to screen athletes for myocarditis.

Knowing that for professional sports where money is no object, the standard really is to do a blood test for troponin, an EKG, and usually an echocardiogram and sometimes more than an echocardiogram. But you're closed sport athlete or high school athlete may not have access to that amount of health care.

So looking at the literature and leaning on my cardiology colleagues, we developed a algorithm or protocol for the primary care doctors, the urgent care doctors, the ER doctors, the sports medicine doctors, and the cardiologists to utilize to make sense of this and to screen athletes appropriately, but not have an undue burden or hold people out of sports unnecessarily.

And utilizing this algorithm, we're able to use a return to play protocol that screens people for cardiac symptoms and does just a simple blood test of troponin and an EKG for the majority of people to screen them for cases of myocarditis.

It's not an alarming number. But when you're talking about a heart problem that could result in sudden cardiac death, one death saved is a big deal. Now, I mean, we did this several months ago. And now fast forward to actually getting some meaningful data out of professional sports. So if you look at the professional sport data with all of the different-- with the NFL, with the NBA, with Major League Baseball, I think with professional hockey was included in that, there's been over 800 professional athletes that have had COVID-19.

And in that population, they're typically screened with blood test, EKG, and echocardiogram. And if there's any abnormalities in those tests, they get a cardiac MRI. And luckily, based on the professional sport data, which is the best data because it's controlled population, it's less than 1% of people have myocarditis.

Athletes that have myocarditis need to be held out of sports, though, for at least three, if not six months, to allow the heart to completely recover from this before they do a return to play protocol and then have repeat testing, including a stress test to get back to playing sports.

When you look at the high school data, it's probably somewhere near the same. If we looked at all of our data and we're in the business of looking back at all of the data that we can capture through the Banner Health System, but certainly through at least through Banner University Medical Center and our referral sources trying to pull together the numbers of patients that we've screened in high school and college athletes and see what that number is.

But just looking at the data from 10,000 feet, it seems like it's probably about the same. That it's not 15%, but it's not 0. And the case that we're discussing today is an example of an athlete that went through this screening and was found to have myocarditis. And a lot of athletes and a lot of parents are like, do we really have to do this? This seems like a hassle. Is it really necessary?

But then, when you diagnose somebody with myocarditis, the parents were thankful and felt like we potentially saved the athlete's life. And that's really what it's all about is that sports is a privilege. And we, in sports medicine, try to make it as safe as possible. And making sports safe in the middle of a pandemic is a little bit difficult. And this is one of the issues that this has brought out. But I think we've developed a good system to be able to still make sports safe for athletes.

A similar protocol, we did roll out with AIA that is-- there's a form and there's the algorithm. The Banner Health form is slightly different from that. But a similar algorithm has been pushed out and is required by high school athletes in the state. And we're tapping into the athletic trainer community to get this in the hands of club sport athletes as well. And we're-- same with the community colleges and the local colleges.

I was forwarded the email from the parents saying how much they appreciated it and credit us with saving-- potentially saving his life. I don't know that we saved his life, but we certainly screened him and made the diagnosis appropriately without screening thousands and thousands of kids with cardiac MRI to make sure that we were saving somebody's life. So the algorithm works in this case. And this kid is not going to be participating, unfortunately, for him. But fortunately, he's not going to be participating with myocarditis and have the potential to experience a cardiac event.

I think it's important for the athletes to know that there are steps to take between getting COVID-19 and returning to sport in order for them to return safely. It's not something that just is-- you can go back right away. A lot of times we've compared it to concussion where there's steps that we need to take in between there and that we need to gradually return back to play.

The best thing has been the flow chart that Banner has provided us, whether an athlete has had no symptoms, mild symptoms, moderate or severe symptoms, it depends on what tests they need after they've had COVID and what kind of clearance they're going to need before they start to return to play protocol. And then, the return to play protocol has also been the biggest determining factor on if an athlete is ready to return or if there are more complications that they are experiencing from COVID.

And I think that the athletes also need a lot more education on those complications that can happen from COVID-19 as well as their parents. Because a lot of them are not aware of those and the severity of them.

As soon as we get word of a positive case, we-- our athletic director usually contact them. And then, he's usually really great about letting them know that they're going to have to go through a return to play protocol to get clearance from a physician. And then, we will contact the parents as well. And usually in that call is when we let them know about the test that they'll need to get done from their physician.

We also will ask them what kind of symptoms they've had. But usually, that's already been done by our athletic director, which is great on his part. And from there, we get the test done. Usually, it'll be caught then. But a lot of the times, athletes will try to get out of that part and just get clearance from their physician without the proper tests because they don't understand the severity of everything that can happen.

But once they've been cleared, we will go through that return to play protocol, which is 6 days with us. If everything is fine, then they're cleared to play. But if something's been caught within those six days, then they return back for further testing.

I have seen during the return to play process, it's mostly been chest tightness or difficulty breathing. We've also had some athletes with extreme fatigue, where they just will go from fighting real good to not being able to do whatever their sport is or that activity and just being completely fatigued. Just 100 to 0 really quick.

Those have been to some chest pains. But mostly, the chest tightness has been what has been described the most by athletes during our return to play. And those are the ones that are getting referred on right away and are not continuing in return to play protocol.

While you have COVID, I wouldn't necessarily recommend working out just because we don't know if you're already having any of those complications while you have COVID. However, if you don't have COVID and you're just at home doing your virtual school and all of that, I would recommend getting out of the house, going on walks, doing your homework out-- all of that good stuff. But still wear your mask. I think that's extremely important.

And also just good hygiene. Washing your hands. If you do go somewhere, coming home, making sure you're taking a shower. If you're out somewhere that's high risk, just good hygiene and wearing your mask and being cautious of what's around you and everything that's there.

Luckily for the Moons, that case was caught early on in the process. So he actually did not even start return to play protocol before his case was caught. His was caught in the early stage when he gets his clearance note from the physician. So right after they get COVID, after their 14 day quarantine, they go to the physician for their clearance.

And so we had sent him to our Banner physicians to get his tests done. And we found out that he had some elevated levels in his blood tests. And from there, he was sent on to the cardiologists and that's where he had that diagnosis of myocarditis. And we were lucky enough to not even have to exert him and risk that from there. So his was luckily caught very early and we didn't have to put him at risk. So we were lucky in that case that he got the proper test done early.

I think it's extremely important. Knowing your child, knowing what's abnormal for them, and also just being educated on what is abnormal as far as post-COVID return to play is extremely important. Because we aren't there 24/7 to monitor their child. So being able to watch them at home is very important.

And also just being aware of what tests are required but also going to be most important. I know it's a financial burden, especially for schools in our district. But in some cases, it could be life or death for their students. And that's something that I myself would definitely much rather get two tests done for my child than down the road be fighting for their life.

So it's definitely a big question mark still. Even with what we do know, there's a lot of unknowns, like you said. But having what we do know helps back what we're telling the parents. Because a lot of the times they have what they see in the media. They have just what they've done on their own research. And being able to say, look, this is what we have, this is our protocol, this is a handout. We even have a handout on myocarditis that we've emailed to all of the student athletes that are registered for a sport. But I also email it to any parent of an athlete that gets COVID-19. So that also is just additional education for them.

Having all of those protocols and additional education resources, it just helped give us an extra backbone, if that makes sense.

I think, in the first place, wearing your mask is the biggest preventative to even get COVID. Wearing your mask, hygiene, hand sanitizer, washing your hands as best as you can. But then, if you do get COVID-19, ask your athletic trainer, ask your health care provider what the proper protocols and procedures are at your school, your institution, wherever you are.

If you're not in athletics at a school, then ask your health care provider. Because even just adults returning to sports, it's still a risk for them. And I think just education on post-COVID complications and myocarditis is very important. And we need to get the proper protocols and procedures done before we return to those sports so we don't risk our lives.

When I got sick, I just felt really bad. I had lost taste, smell, I had body aches and stuff. But I thought I was completely fine, like I could return to play. But then, when I found out that my heart had issues, that was actually really shock-- a big shocker because I thought that that was-- that didn't happen to people. But then, it happened to me.

But I was really grateful for that happening because I would have had a lot of heart issues. But it's going to be three months until I can get back. So I think they said April 18. So it's going to be a while, but it's a safe thing to do and I'm glad it happened.

Frustration at the situation. Disappointment. But like Ryan said, just deep gratitude that this was caught. If it hadn't been caught, he was set to come back on January 26th and then have a six day phased return to play. And he would have been playing with this heart issue, this myocarditis, and that can result in really bad outcomes like sudden death, like Pistol Pete Maravich the NBA player. Or it can be a lifetime impaired cardiac function.

And so I'm just extremely grateful that this was caught. And while I didn't like the initial difficulty of coming back, the idea is I think that I know a lot more than I know at times, and a lot of parents do. But thankfully, the district was looking out for us and they knew a little bit more about this than we did. And they put the protocol in place to literally save us from a lot of heartache and just downtime. Even if he were to come back, it would be not nearly as good as it could have been.

All those things are going through my head. And it's emotional roller coaster of one moment. Hey, we're going to get through. This is awesome. The next moment-- but we just lost so much. But three months compared to the rest of his life, I mean, it's a no-brainer. You just look at the big picture and be grateful that you have what you have.

Once I got tested positive for COVID, I had to go to urgent care to get cleared or get the echocardiogram. They said they could do it there. But then, when we got there, they actually couldn't. And then, we called multiple other urgent cares. They couldn't do it.

So then, we had to go to our local doctor or whatever you would call it. And then, we had to go to Banner after that, like the Banner Sports Medicine Facility. And then, they got my blood drawn and then they did an echocardiogram. And then, a day later, they told us that my tryptophan levels-- or troponin-- sorry. Troponin levels were at 12 and the normal is 6.

So after that my-- or local doctor, whatever you call it. Not the Banner one, said I can't play for three months because I have an inflamed heart, which is called myocarditis. So that's how I found out about it.

I thought something like heart issues-- I have asthma and stuff that's minor lung issues. But I didn't think I'd ever have our heart issues like something like that. I just didn't think that was possible. So when I heard it, my heart kind of dropped. And I realized that it didn't exactly sink in at first.

But over time, I realized that [INAUDIBLE] in seventh grade. That was a month and a half. But this is double that. So it kind of just like was a big shocker. At the same time, I was relieved because I realized I could have had irreversible heart damage if it wasn't caught.

So in seventh grade I broke my hand and it took a month and a half to get back. But that was only like a month and a half. This is three months. So it really sank in that I'm going to be out for three months. But it just showed me the severity of this that if I go back too quickly, it's going to give me heart damage or I could die. So I was relieved that I could be safe. But then, I was also frustrated and sad that I couldn't go back to basketball.

On the team, they were asking about me. I told them that I could be back-- me and my dad that we'd be back. But then, it just was a roller coaster. We would be like we just need to go and get this. That never happened. We need to get my blood drawn and it end up being too high.

And eventually, I just stopped talking to them because I realized I'm not going to be playing for the season. I'm not going to see them for a very long-- for kind of like a long time. And then, a few of my best friends, I told them about it. My best friend, he's doing soccer and he was sad to hear about it.

But he would he says he likes-- he would want to go and hang out with me at the movies. So that was a big thing for me.

It is uncharted territory-- COVID-- Coronavirus. It produces a lot of results that we don't fully understand and the limited research about cardiac issues and student athletes. It's pretty clear that there is an association. So you risk everything if you push forward with this idea. We're just going to get better and go right back to the sport. We've kicked to COVID to the curb.

And then, you end up having like a defibrillator implanted into your heart if you survive. Because you have a heart attack that could kill you. And really, what is the point? What are you trying to do for your kids? You're trying to do what's best for them in the long-term. Is it momentary happiness on the basketball court, or is it a lifetime where you're going to have your kids they're going to be around, they're going to be healthy.

And Ryan's got three more years where he can play basketball. And that's more than we lose. So if by me talking to you-- to the parents out there, don't risk it. It's not worth it. It's disappointing. Your kid is going to be really disappointed. You're going to be disappointed for them because you love your children.

But if you truly love them, you're going to realize you've got to do what's best for them. And sometimes, you have to make hard decisions. But this was a hard but easy decision when you look at the balance. Play now and you can have a disaster. Or just do what the doctors say and then follow the protocol to come back when you're ready.

If you've had COVID-- I'm not a doctor so I'm practicing medicine right now. But you really do want to follow their guidelines. And if you're an athlete, you need to get the heart checked out-- the function of it. And they're going to look for is the heart working properly as far as the electrical system? They're going to look for this troponin enzyme. And if it's elevated, it shows there's been damage to the heart muscle, which causes swelling, as you can imagine.

If you sprain an ankle or something, it's going to swell. Well, a swelling heart can be extremely deadly. So you don't mess around with this. This is not like the flu. This is something altogether different and the outcome can be really disastrous if you don't manage this well. So take it from me. I thought that I knew enough, but I didn't. And the district-- Sean McDonald at the district. He's the [INAUDIBLE] of athletics. Well, he's the superintendent.

He's the one who set up the protocol. And if he hadn't done that and I had rushed Ryan back, I don't really want to think about what could have happened. That to me is frightening.

Don't risk it. With the way I was thinking about it mathematically, three months is $\frac{1}{12}$ of your high school career. If you play league ball and stuff, three months-- that's $\frac{1}{4}$ one year. And then, you've got four years. So you're risking your whole life based on one-- based on $\frac{1}{12}$ of your high school year. It's just not worth it.

And it's also given me more time to work on school, hang out with people, talk to friends. It's giving me more time to do that. It sucks I can't play basketball. But I can do other important things and I'm not in risk of dying or hurting my heart.

So I have to say just don't risk it. It's not worth it. You should really get that blood test because it could happen to you. It happened to me.