

## Cardiac Screening for Young Athletes

COVID-19 Patients Encouraged to Consider

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What should parents consider before their children become physically active again?

[00:00:10.29] But the big issue here, is that COVID-related myocarditis is a real entity, meaning that people have an infection with COVID-19, and it results in a viral infection, or an inflammatory response in the heart that potentially can cause arrhythmias or structural damage to the heart. So there's some new guidelines that are being published by cardiologists and sports medicine entities outlined for parents and providers what to do. And if somebody really has a concussion or has COVID-19 and test positive, but doesn't really have any symptoms or doesn't run a fever or have shortness of breath or cough that lasts for more than three days, then nothing really needs to be done. But even if you test positive for COVID-19, and you've been sick for a week with fevers and shortness of breath, there's a chance that the viral infection is fulminant enough that it could involve myocarditis.

[00:01:23.28] So the recommendation by our cardiology colleagues is for athletes of all age, if they're sick for more than three days, for them to at least have an EKG, which is a screening test for myocarditis. Because typically, you can see typical changes on the EKG that would warrant more further evaluation by a cardiologist, including an echocardiogram or even an MRI of the heart.

[00:01:54.75] But the message to parents is that there is the potential for your athlete to not just get COVID-19, but get an infection or inflammatory response in the heart that could be a significant issue. So no athlete should return to play if they've test positive for COVID-19, or they have a COVID-19 like illness and didn't get tested. People should be asymptomatic. Not any symptoms of fevers or chills or shortness of breath or cough for 14 days after they get diagnosed. So that we know that the body has time to clear the virus from the entire system, including the heart. And if they had symptoms for more than three days, that they need to see their primary care physician, a sports medicine specialist, or cardiologist, and at least get an EKG to screen for myocarditis.

Is myocarditis something you've seen in patients before COVID-19, or is it new?

[00:03:02.26] This is not something that is new. It's actually pretty rare in athletes, but there are other viruses that can cause it. And that's the general recommendation why in sports medicine, if somebody truly has a temperature over 101.5 with a illness, we would encourage them not to participate until they're completely asymptomatic and don't have a fever. Because during an acute viral infection involving other viruses, you can get myocarditis. It's just that we're finding that, primarily with hospitalized patients, that one of the reasons that people take a long time to get off the ventilator or have complications from COVID 19 is not just the respiratory infection, but sometimes the cardiac infection.

What recommendations would you offer parents for their young athletes?

[00:04:00.15] We should be looking at what the standards are by the CDC, and our epidemiologist, of whether it's safe to go back to playing sports. And there are publications and websites that track the data and make sure that your local community, your zip code, or your county has been cleared to play sports by the CDC criteria. And that just like with anything, you need to acclimatize to playing your sport so you don't go from doing nothing because of COVID-19 for the last two months, and then go out and practice for three hours a day when it's over 110, or run five miles a day. Because we don't want people to get heat illness or other sports injuries because they have all this pent up energy that they haven't been able to play their sport for a while, and now they're cleared to.

[00:04:56.37] So you still need to go back to doing things in a stepwise fashion. You still need to be entirely safe with regard to COVID-19. And if athletes want to participate in a team sport, they need to do everything right off the field and on the field to try to prevent them from getting COVID-19. And that includes hand washing and hand sanitizer and wearing your mask when you're in public, and not going into situations where there's groups of athletes at a party or big event, or there's lots of people, because we know that that spreads COVID-19. And it's not just doing it for you, but it's doing it for your whole team.

Should athletes consider getting a flu shot this season?

[00:05:44.91] The CDC has come out with recommending people get the flu shot, influenza shot, sooner this year than they typically recommend. And that's because we know that we're going to be still dealing with COVID-19, and influenza is right around the corner. So as soon as influenza vaccine becomes available, we strongly recommend all of our patients, but especially our athletes and those with chronic lung disease, to get the flu vaccine as quickly as possible. And parents of athletes really should educate themselves on the symptoms of COVID-19, the symptoms of influenza, and the symptoms of the common cold. So that they can make good decisions about whether their athlete should be going to practice, should be going to the pediatrician, or should be going and getting a COVID-19 test.

[00:06:40.34] Right.

[00:06:40.96] And Banner Health has some good educational materials about that. I saw on one of the social media sites one of our posts that had a table that explained those symptoms, which I think is very valuable for athletes and parents to know, given the fall sports and winter sports that are going to be participate-- and there's going to be still COVID-19, but we're going to have common cold and influenza that we're dealing with as well.

What else should parents ask when meeting with their children's physician?

[00:07:16.48] When your athlete gets their pre-participation physical, you want to address any health issues that you may have. Asthma and those kinds of things. But that may be an opportunity to get an influenza vaccine. That may be an opportunity to talk about COVID-19. And we recommend everybody that is diagnosed with COVID-19 that is returning to sports, for them to not participate until they've been symptom free for 14 days. And during those 14 days,

that they see their primary care physician, a sports medicine specialist, or a cardiologist to make sure that they've been appropriately screened for myocarditis.

What challenges do physicians like yourself face in treating myocarditis?

[00:08:05.82] There's not a lot in the medical literature about the incidence of this. There are lay press articles, or reports, that that's one of the reasons why the Big Ten canceled their season. Because there were teams where 30% of those diagnosed with COVID-19 had evidence of myocarditis by their EKG or their follow up testing. So maybe as high as 30%. Now that's lay press information, not medical studies or publications regarding COVID-19 myocarditis, but it's not one in a million. It's a lot more common than that, and I think that we need to educate parents and athletes about this entity, and make sure that they take the appropriate precautions, because everybody wants to get back to their normal lives and normal exercise routine and playing on teams, but with education, and make sure that we take the appropriate precautions so we don't end up with some long-term issue.

Michael Perez, MD

Pediatric Cardiologist, Banner Children's

What are you studying in relation to COVID-19 and its effect on the hearts of athletes?

[00:09:21.14] The majority of patients with COVID-19 are either asymptomatic or having very mild symptoms that we're seeing. In the hospital setting where I take care of patients, we have had children from infants up to teenagers, who've had a myriad of symptoms. And that's part of the challenge, is that some are having inflammatory processes with fever, rashes, elevated blood markers, that suggest inflammation, not just in general, but also of the heart. And that kind of takes us to what we've seen in some reports recently with athletes. But I think on a bigger scale, just in general, in the general population, we're seeing that a lot of these patients are having signs of inflammation and scar formation in their heart. Even after recovery, even in asymptomatic cases.

What advice do you have for athletes who've tested positive for the coronavirus?

[00:10:27.03] In children, there's not as much data yet obviously. So as a pediatric cardiologist, we are still trying to figure this out a bit, and we're being a little bit more conservative with this process. So if a patient, who is a college athlete or a high school athlete or just a competitive athlete, participating in sports where they're pushing their bodies and pushing their hearts, and they've had COVID-19, then usually, we're suggesting that during that process or shortly thereafter, they be evaluated by their physician, and then their primary care physician, and see if they warrant further workup with a cardiologist. What we typically are doing is if we're concerned that they were infected with COVID-19, we're checking to see if there's signs of inflammation. That can still be an issue a month after the process. Now typically, those patients are coming in and having symptoms, so they're not usually asymptomatic with the inflammatory process that we're seeing. But in all those cases, we're checking for cardiac and inflammatory markers in blood. And if that's positive or there's other concerns, they're having

chest pain, they're having shortness of breath with activity where that wasn't the case before, then we're proceeding with other testing, such as cardiac imaging with an echocardiogram, which is an ultrasound of the heart.

What other signs should athletes and parents be aware of?

[00:12:11.47] Specifically, the chest pain that we're worried about is with exertion or with exercise. So if they're trying to do something active and they start having chest pain, typically, that chest pain, the characteristics of it, is that it's somewhat lingering in pressure, in character. The shortness of breath, typically, also is occurring with activity. Now, we're not really sure how specific that is, but if that's something new, then that's obviously a concern. Fatigue or decreased energy levels. So if they're an athlete and they were able to run a certain distance or do certain drills as part of their practice and they're not able to do that anymore, then that'd be another concern that they need to be evaluated.

What questions should parents ask their children's physician about this condition?

[00:13:04.89] Even if they're cleared by their physicians or by their cardiologist, they should always be asking the question, well, what should I be watching for as far as the symptoms? And those are the ones that we just talked about, and I will add a couple others. Palpitations or sensation of their heart racing or beating in an odd fashion. We do know that some of these patients can have arrhythmias or abnormal heart rhythms as part of the post-COVID inflammatory process. So that'd be another thing. Passing out. That one, you'd think, would catch most people's attention. But if that's something that's happening and something new, that's something that we see that is a different process in most cases just in the general population. But now, in this specifically, if you're concerned about COVID, then we need to be evaluating to see if that's something heart-related or not. But they need to be asking questions about what are the symptoms that we're looking for to make sure that person is healthy and participating in whatever sports, or just exercise in general, moving forward.

What's the best treatment to ensure they can return to their active lifestyle?

[00:14:31.13] If they have a condition where they do have inflammation to their heart, and it seems like it's affecting their heart function, then there are some oral medications that we have employed before with other processes that affect the heart. So specifically, myocarditis is an inflammation of the heart muscle following a viral process, or in some other cases, following infectious processes. That part isn't new. We know that viruses can do that from before, and it seems like COVID-19 is capable of causing an inflammatory process in different people to cause that inflammation. And so we do have guidelines to kind of watch and treat patients that have that.

What's the best treatment to ensure they can return to their active lifestyle?

[00:15:25.17] The caveat is that we don't know if there is a difference with COVID-19 and the myocarditis, if there is a typical form with that, and how long we need to treat. So right now, that's a little fluid. But usually what we're doing is oral medications if the heart function needs some help. If it doesn't, but there are signs of inflammation, regardless, then we're watching them conservatively with echocardiograms, and then cardiac MRIs to look to see if there is any long-term scar formation that may impact their heart health moving forward over time. We're usually doing that about three to six months after their acute illness or COVID related inflammatory process.

Is this condition unique to COVID-19?

[00:16:18.69] Just in the general population, including athletes, somebody could be exposed to a virus that might cause myocarditis or inflammation to the heart. There's also something else, typically in younger patients, and in children that are toddlers and school age. 6, 7, 8 years old. Where they can have inflammatory processes that have affect the arteries that feed the heart muscles, called the coronary arteries, and those can become enlarged or even form aneurysms, balloon shaped deformities of their arteries. That is something called Kawasaki's Disease. Now, we're seeing that with COVID-19. Some children, and even some teenagers, are having some of those changes as well.

[00:17:10.92] But we know that that existed well before COVID-19. Myocarditis, which is that inflammation of the heart, existed well before COVID-19. And there are multiple different viruses that we've found in the past few decades. Parainfluenza. A group of viruses called enteroviruses, coxsackievirus, adenovirus. Those viruses have been well-documented to be associated with myocarditis, and so we're following some of those management guidelines as physicians, knowing that this is all kind of fluid and we need to be adjusting as we see different patterns or different changes in symptoms and findings with these patients.

What should parents focus on regarding this condition?

[00:18:03.09] I would say the one thing that I kind of mentioned a couple times. As physicians, we are trying to be aware and be, I guess, flexible in our thinking. And I think families and athletes should be doing the same. If you've tested positive, or you've had one of these inflammatory processes. So that's another thing that I'll mention. The inflammatory process specifically with COVID-19, which affects the heart, but can affect multiple other organ systems, is called multisystem inflammatory syndrome. And the heart is part of that, but we know that there's inflammation throughout the body.

[00:18:52.81] And so thinking, always checking to see, well, is he or she having new symptoms? Headaches where there weren't headaches before, vision changes where there weren't before. So not just heart related symptoms, but just if there's some new change or some new sign or symptom that may come across as benign, but it's something new, then you always should kind of be thinking, is that something related to some inflammatory process following the infection? And the key here is we just don't know enough yet, and we're just trying to make sure that we're being conservative and thinking long-term, as well as short-term.

Does MIS-C affect people of all age and fitness levels?

[00:19:45.72] That's the other scary part, but we all need to be realistic about it, is that no matter what your age or how healthy you are, we have seen, and we just don't know who it's going to hit hardest, or how it's going to impact a certain person's body. So we all need to be cautious, because we've seen as young as infants passing with a COVID-19 related infections.

What recommendations would you give to people who think they may have MIS-C?

[00:20:24.91] So far, we don't have the research yet that the adults do, just given the fact that we have less numbers in pediatrics. But I would say, kind of following what they've been seeing, if you've been diagnosed with COVID-19 and it's a child with asthma, or high blood pressure, obesity. Some of those comorbid conditions, or things that put you at higher risk in the adult world, then I think that we should probably at least apply that to children and kind of be a little bit more meticulous about their evaluations and clearing them for activity.

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