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# How is the structure of the heart and its physiology structured in those who regularly do sports and how important is playing sports for health!

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**Abstract:** This article describes in detail the heart structure and physiology of people who regularly do sports.

**Keywords:** Cardiovascular system: a team effort.

This is a pair of heart and blood vessels. Professor Carré explains to me: Le heart, it is a muscle, it is filled with blood and when it reaches a certain pressure, it opens the valves, contracts, throws the blood into the aorta, and from there the blood is distributed to all the organs. v heart therefore pump.

What is a pulse?

This is the number of contractions, therefore, the output of blood from the heart in one minute, in other words, the number of beats - therefore, its unit is beats per minute (beats per minute). Heart rate fluctuates throughout the day for a variety of reasons, such as exercise, stress, or caffeinated beverages. Resting heart rate is the heart rate recorded when the body is completely at rest, it varies according to people, gender, habits and lifestyle. Cardiac output is the amount of blood ejected by the heart in liters per minute. On average, a resting heart pumps 5 liters per minute.

WHAT HAPPENS IF YOU EXERCISE REGULARLY?

- you will improve the strength of your heart, your heart will work less to distribute blood efficiently throughout the body.

- You protect your arteries because physical activity opens blood vessels and improves blood circulation.

- Blood circulation improves and you lower blood pressure.

- You can reduce bad cholesterol and blood sugar (blood sugar).

In the end, you reduce the risk of cardiovascular disease (heart attack) or cerebrovascular disease (AVC).

There's no doubt that exercise benefits your cardiovascular health and other parts of your body. Just like how your quads or your biceps respond to exercise, keeping your heart muscle under controlled stress allows it to adapt and strengthen, becoming stronger and more efficient.

But when you train hard for years, your heart undergoes more significant changes to adapt to the load, resulting in what experts sometimes call "athlete's heart."

The long-term consequences are not fully understood. Some studies show that the relationship between exercise and heart disease risk is more of a U-shaped curve than a decline in exercise. In other words, as you become more sedentary and moderately active, your heart

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problems will decrease. But if you work your heart out for a few hours a day, the risk may start to rise again.

"There's a tipping point where we can maximize our cardiovascular health," says Jared Bunch, MD, medical director of heart rhythm services at Intermountain Health Heart Institute and director of the American College of Cardiology. Committee member of the college sports council.

However, the data is inconclusive, says Jeffrey Lander, MD, associate professor of sports cardiology at Morristown Medical Center in New Jersey. Long-term studies are needed to understand how heart problems manifest in athletes. Changes that appear highly harmful may not produce the same results as those that are less active.

As they continue to study this issue, cardiologists agree that simply playing sports does not create immunity against heart problems. If you have symptoms—chest pain, shortness of breath, or a sudden and unexplained decrease in athletic ability—see your doctor.

In addition, athlete's heart can mimic the symptoms of serious heart problems, even if it does not require treatment. That's why it's good for athletes and their healthcare providers to know the basics.

What is an athlete's heart?

Years of endurance exercise—think running and cycling—put high demands on your heart's hard-working muscles. To pump, your body works to increase the amount of blood it pumps out, called cardiac output, or liters per minute, says Justin Triwaks, MD, medical director of the Cardiovascular Clinic at Beaumont Hospital in Michigan.

The main upgrade required is an enlarged left ventricle, which does the heavy lifting of pumping oxygen-rich blood through the aorta to the rest of the body. The muscular walls of this chamber thicken and the space inside expands. Meanwhile, the other chambers of the heart are working hard to get bigger.

Increased cardiac output means your heart doesn't have to work as hard when you're not in the gym, Dr. Trivax says. That's why athletes often have a resting heart rate that can cause anxiety in other people.

Strength training also changes the heart. "Unlike endurance training, where we're putting a lot of strain on the heart, with strength training it's under a lot of pressure," says Dr. Lander.

Lifters, especially those who descend and catch their breath using the Valsalva maneuver, produce temporary but significant increases in blood pressure. When they do it repeatedly over time, the heart walls can thicken, but the left ventricle doesn't usually get as big as it does in endurance athletes, Dr. Lander says.

What are the consequences of an athlete's heart?

These changes in heart are part of what drives you to the finish line or a new deadlift max. But they may not be completely benign. In endurance athletes, patches of scar-like tissue called fibrosis can form when the heart chambers are stretched, and this can change the way electrical signals travel through your heart, Dr. Bunch says.

In fact, many (but not all) studies show that middle-aged and older athletes, especially men, have a dangerous type of arrhythmia called atrial fibrillation. It occurs when the upper

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chambers of the heart vibrate and appear in sync. Atrial fibrillation can cause symptoms such as weakness, shortness of breath, and decreased athletic ability, and contributes to the risk of conditions such as stroke and heart failure, Dr. Trivax says.

These changes can take about 3 to 4 months to develop, and they mostly occur in people who exercise more than an hour a day or more than 420 hours a year, Dr. Bunch says.

For reference, the latest exercise guidelines for Americans—published in November in JAMA—recommend 150 minutes (2 hours and 30 minutes) to 300 minutes (5 hours) of moderate-intensity exercise per week for healthy adults. per week or from 75 minutes (1 hour and 15 minutes) to 150 minutes of active activities.

While an average of more than five hours of physical activity per week may provide additional health benefits, the 17 experts on the guideline panel stopped short of making the same claim for extra exercise.

There is also evidence that long-term endurance athletes have higher levels of coronary artery calcium, a hard compound in the blood vessels that can contribute to heart attacks. But what's still unclear is whether increased calcium poses the same risk in athletes as inactivity, says Dr. Lander.

study published in February in JAMA Cardiology found that people who did vigorous exercise, the equivalent of a 10-minute brisk walk per day for six miles, had increased calcium levels, but it was correlated. did not increase the risk of death from heart disease In fact, although the researchers cut it in any form, the risk of death was lower for those who were well trained than those who were sedentary.

What to do about an athlete's heart?

Elites and professionals usually have heart tests, and Dr. Trivax advises recreational athletes to do the same: "Anyone who participates in regular exercise should have a cardiovascular test, especially if they're overexerting themselves. "If they are dating," he says.

This type of screening can detect impending problems that increase the risk of sudden cardiac arrest during physical activity. For example, in your document you can see the early warning signs of aortic dissection - this often causes the wall of the aorta to become dead, and this is caused by changes in pressure that occur during strength training.

One problem: Symptoms in an athlete's heart can look very similar to cardiomyopathies, diseases of the heart muscle that can be inherited or develop from other conditions, such as high blood pressure or diabetes. Cardiomyopathies often contribute to sudden death in athletes on the field or in a race, says Dr. Lander.

It can be difficult to tell the difference, but more advanced procedures like cardiologic MRI give cardiologists more tools to tell the difference, says Dr. Lander. If it's still unclear, your doctor may ask you to stop exercising for a while to see how your heart responds; after several months of rest, many symptoms of athlete's heart decrease, he says.

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If you have cardiomyopathy or another condition, a sports cardiologist can work with you on the safest way to approach exercise, says Dr. Trivax.

Otherwise, the athlete's heart is not a disease or a condition such as heart failure or high blood pressure. Thus, it does not require self-treatment.

Dr. Trivax says what it should take is vigilance. Fortunately, athletes are attuned to their bodies, and tools like heart rate monitors (and even the Apple Watch) provide additional information.

Talk to your doc if you feel like your heart is beating, jumping, or jumping when it shouldn't, or if you notice sudden and unexplained changes in your heart rate—like a resting heart rate of 70 when you're in your 50s, or if you notice that you've climbed a step. Go up to a sprint of 180 or a normal max of 130, says Dr. Trivax. And make sure your doctor knows if you have a family history of heart problems.

Other red flags include passing out during exercise, chest pain, and a general feeling that your performance is off for no apparent reason. "These are very subtle — reaching the highest goals you've ever reached or feeling like you've pushed yourself harder than before," says Dr. Lander. "Or even if you're talking about a team sport, all of a sudden you feel like you can't keep up with your teammates, and nothing else has changed."

If you develop atrial fibrillation or other heart problems, treatment can sometimes be difficult. Many heart medications are not ideal for athletes because of side effects such as dehydration, electrolyte abnormalities, poor performance, and muscle soreness.

That's another reason to see a sports-oriented cardiologist, Dr. Trivax says. It can work to balance the risks and benefits depending on your athletic activities.

How can you avoid athlete's heart?

Dr. Bunch says there's a lot you can do to protect your heart outside of the doctor's room. Commonly used lifestyle recommendations—eating a nutritious diet, getting enough sleep, and not smoking—also apply to athletes.

Also, be careful with energy drinks and supplements. High levels of caffeinated energy drinks can cause dangerous heart problems — some of them are more than 300 milligrams, Dr. Bunch said in the lab, not far from 500 milligrams to trigger an abnormal heart rhythm. These effects are enhanced by exercise.

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