

Cardiovascular Testing Should be Required Before Playing Sports

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Abstract

Sports are a necessity when it comes to physical fitness. Likewise, physical health is also important for maintaining the body. There are some cases in which physical health and physical fitness clash leading to tragic injuries and accidents. Sudden injuries and cases of death in sports due to underlying cardiovascular problems is something that is beginning to become more noticeable. However, many of these incidents can be prevented from the root and can go as far as directing the student athlete to the resources needed to get help if athletes are to abide by specific requirements. These requirements are not met by filling out a normal form. Instead, they would include heart screening specifically with the goal of uncovering any unknown cardiovascular problems the athlete might be unaware of.

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Throughout a student's years in high school and college, it is extremely beneficial to be engaged in activities such as sports. According to the American Health Association (2017), the benefits of playing sports include boosting energy levels, managing stress, maintaining a positive outlook, and creating advances in an individual's physical health. However, when determining which sports to join, it is important to take into consideration the student's current state of health. There have been various cases in which an athlete collapses on the field due to underlying, undetected cardiovascular conditions. Jackson Pfister, a freshman football player at Esko High School, had such a case. During a varsity football game in Northern Minnesota, the 15-year-old collapsed on the field and later passed away. A preliminary report from the Ramsey County Medical Examiner's Office stated that the incident was due to congenital heart disease (ABC News, 2019). Skylar Lasby, a 12-year-old football player in Saranac Michigan also collapsed on the field due to having an abnormal heartbeat and eventually passed away as well (ABC News, 2019). Jackson and Skylar are not the first students to die for these reasons and unfortunately may not be the last. Nevertheless, if the necessary precautions and the required examinations are taken these deaths can be minimized.

The heart serves the function of transporting oxygen and nutrients to cells of the body and pumping blood to all organs (Chabner, 2017). The heart consists of four chambers, the two located on the top portion of the heart are called the left and right atria, known as the "collecting chambers". The bottom two are called the left and right ventricles, known as the "pumping chambers". The right atrium and ventricle serve to receive blood from the body and pump it to the lungs while the left atrium and ventricle serve to receive blood from the lungs and pump it to

the body (Weinhaus & Roberts, 2009). There are two types of oxygenated blood that travel through the body, oxygen-poor blood travels to the lungs in order to obtain oxygen while oxygen-rich blood returns from the lungs to travel to the rest of the body. In short, the right portion of the heart manages the oxygen-poor blood and pumps it to the lungs. The left portion of the heart manages the oxygen-rich blood and pumps it to the body. Blood pressure increases to transport blood, then oxygen-rich blood is carried away from the heart to the body. In addition to flowing oxygenated blood, the heart also works to transfer beneficial elements such as nutrients to the body (Weinhaus & Roberts, 2009).

The heart also includes four valves to ensure the blood flows properly as well as stop the backflow of blood (Weinhaus & Roberts, 2009). As for the muscle layers of the heart, they consist of the endocardium, the inner lining of the heart, the myocardium muscular middle layer of the heart, and the pericardium, the membrane surrounding the heart, consisting of visceral and parietal membranes (Chabner, 2017). Capillaries are the smallest vessel unit that exchanges blood between arteries and veins. The blood vessels of the heart consist of arteries and arterioles. Arteries are responsible for carrying the blood away from the heart while veins are responsible for carrying blood towards the heart. Venules are small veins containing valves to restrict backflow and oxygen-poor blood is carried towards the heart coming from the body (Chabner, 2017).

According to the Mayo Clinic (2018) cardiovascular diseases, otherwise known as heart diseases, are conditions that affect any of the heart's muscles, vessels, valves, and rhythms. Some of the common cardiovascular diseases are arrhythmias, coronary artery disease, congenital heart defects, cardiac arrest, and congestive heart failure (Davis, 2019). Arrhythmias

refer to the irregular beat of the heart and has two main classes. The first is atrial arrhythmia which originates in the upper chambers of the heart. The second is ventricular arrhythmia that originates in the lower chambers (Michigan Medicine, n.d.). Coronary artery disease begins when the major blood vessels get damaged affecting the amount of oxygen, nutrients, and blood that is provided through these vessels. Cholesterol-containing deposits start to form in the arteries which begin to block the blood flow to the heart through the coronary arteries. A congenital heart defect forms prior to birth when the heart or vessels do not develop as they should (American Heart Association [AHA], 2018). Cardiac arrest refers to the sudden loss of heart function and can have severe outcomes if not treated properly (AHA, 2017). Finally, congestive heart failure is when the heart muscle functions inappropriately because it is either weak or stiff, making it difficult for the heart to provide blood to other parts of the body (Brindles & Cherney, 2019). However, most of these diseases go undetected in a routine physical, which is why so many youth are dying on the playing field. According to Close the Gap ("Young Athletes" n.d.), a young competitive athlete passes away every three days suddenly and those athletes are more than twice as likely to suffer a sudden cardiac death, in comparison to non-athletes. Therefore, high school students should be required to get tested for any cardiovascular problems before being allowed to participate in any sport in order to ensure their health and safety.

When identifying the types of cardiovascular diseases that take place within athletes, age plays a role. The death of young athletes due to undetected heart problems can have various reasons that account for the unfortunate loss. As for older athletes, sudden cardiac death is frequently caused by coronary artery disease (Crawford, 2007). Coronary artery disease consists

of the coronary arteries, blood vessels from the aorta that supply oxygenated blood to the heart, being narrowed or blocked by atherosclerosis. Atherosclerosis is the buildup of cholesterol on the inner walls of the arteries creating thrombotic occlusion (clotting), which is when the lining becomes roughened which could result in a rupture. The most common symptom of coronary artery disease is angina, chest discomfort. Symptoms usually go unnoticed until a heart attack occurs (“Mayo Clinic”, 2018). Fatigue, shortness of breath, pain in arms or shoulders, and arrhythmia are all symptoms of coronary artery disease. One of the treatments is percutaneous coronary intervention (PCI), when a balloon followed by a stent open the clogged coronary artery. Another can be coronary artery bypass grafting (CABG), which is a surgical intervention to bypass the obstructed vessels. Medical treatments include anticoagulants, antiplatelet drugs, among others.

To shift the focus to Michigan specifically, the Michigan High School Athletic Association (MHSAA), a private non-profit organization, with over 1,500 voluntary private and public middle and high school members, was created to develop programs aimed towards middle and high school students to ensure the safety of student athletes (Michigan High School Athletic Association [MHSAA], 2019). This is done by requiring several established rules to be followed for sports and athletic competitions run by the MHSAA. These rules are set by the representative council, elected by participating schools to represent their designated positions. Some represent specific schools in the same regions while others represent nonpublic schools statewide or middle and high schools generally (MHSAA, 2019).

To be eligible to be a part of this organization, as a school or an athlete, the MHSAA requires a medical history form, created by the MHSAA, which generally covers the athlete’s

health history. There are many general focuses of the form, one of which is on the heart. The answers are in fact based on the current knowledge of the athletes rather than official documents, screenings, or tests. Although this form can have many benefits, it can also provide misleading information in a variety of ways. The insufficiency in the medical requirements can have fatal effects on athletes who have cardiovascular diseases they are unaware of. To clarify, checking “No” as a response on the form for the questions relating to the heart puts athletes’ lives at risk. This misinformation can allow them to play their desired sport, which can worsen the symptoms of a disease they may have, leading to the possible death of the athlete if not treated properly. Moreover, some individuals haphazardly fill out health forms without being aware of what exactly they are checking “No” for.

Another flaw in this form is its reliance on the individual’s answers. Even though the health provider signs the bottom of the form when completed, they are not required to confirm the answers. Mentioned above was the case in which they do not know their symptoms. However, it is also possible for athletes to know and hide this information in order to play the sport intended. It is also likely for the student to understate symptoms or self-diagnose themselves. As an example, if a student had been getting frequent headaches, the student can check “No” on the form, claiming that it is normal or “just a headache because of stress or something”. To eliminate taking these chances, it is best to have official tests conducted by appropriate health professionals.

Currently, Michigan has a concussion law in force, instituted in 2013 and amended in 2017 (Michigan Department of Health & Human Services [MDHHS], n.d.). Michigan was the 39th state to recognize the severity of concussions and to make a law regarding the matter. This

law requires every leading individual involved with youth athletic activity such as the coaches, employees, or volunteers to successfully take part in a concussion awareness training program, which must be taken every three years. This law also obligates the organization to present informative knowledge regarding concussions after which they will acquire a signed statement confirming their participation. The last major component of this law is the dismissal of an athlete instantly if they project any signs of a concussion. In order to participate again, the athlete must present a written clearance approving such action (MDHHS, n.d.). Although there is no law requiring cardiovascular testing, the state of Michigan recognizes sudden cardiovascular deaths and the importance of maintaining the health of the heart, considering 300 lives are lost yearly due to general sudden cardiac deaths. To combat this, the Michigan Department of Health and Human Services has recommended two main prevention approaches. The first is through partnerships such as the Michigan Alliance for Prevention of Sudden-Cardiac Death of the Young (MAP-SCDY). The second is by implementing the MI HEARTSafe School program to improve the response to cardiovascular emergencies. To determine these two, there were surveillance and reporting techniques put into place to identify the intensity of this issue (MDHHS, 2019).

With that said, there have been other states that began practicing cardiovascular testing before admitting athletes into sports. Florida, for example, has made cardiovascular testing required in some school districts. This requirement has proved beneficial after a mother claimed her son was “saved” due to this testing. This family had no previous heart problems within its members and would not have considered cardiovascular testing if it had not been a requirement (McCallum, 2019). If the student had not been tested beforehand, this incident would have been

among the multiple others. A similar case occurred in Florida over 10 years ago to Rafe Maccarone, a 15-year-old who collapsed due to a cardiac arrest. Rafe was sent to the hospital but unfortunately died the next day (Florida Today, 2017).

Although sports are generally known as being the same, they can be distinguished into two distinct categories, competitive and non-competitive. Of course, every sport has some sort of competitiveness depending on the individual and the specific sport. Competitive sports are sports that require the maximum amount of discipline an individual can put forth in order to be able to compete. In other words, it requires a great amount of physical exertion (O'Donnell, 2019). These sports tend to be the most popular ones such as football, soccer, and basketball, with football and basketball being responsible for two-thirds of the sudden deaths of athletes in the United States (Cardiac Health, n.d.). People who view sports like that are typically very stressed about it and will attempt pushing the limits of what the body can really withstand in regards to the competitiveness. Nonetheless, if practiced correctly, sports as such have various advantages, such as teaching social skills, understanding the importance of roles and respecting them, building confidence, accepting a loss, teamwork, and many more (Long, 2018).

In contrast, non-competitive sports focus more on leisure rather than competitiveness. Non-competitiveness promotes a more relaxed environment, engaging in a sport for the fun of it, as a means of destressing, having no reason to be competitive. Moreover, it teaches useful skills, stimulates healthy growth in a safe environment, and encourages self-growth. A few of these sports include archery, surfing, skateboarding, cycling, and hiking (O'Donnell, 2019).

In sports, generally, the heart works in conformity with the pressure put on it. This is especially true for athletes or individuals who play sports a good amount of the time.

Considering the high function of the heart pumping blood throughout the body and spreading oxygen, it needs to constantly adapt to such changes. To elaborate, during exercise or sports it is crucial to have the oxygen delivered at a higher and faster rate than normal, demanding the heart to work faster. Eventually, after continued exercise or sports, the heart will increase in size, thickness, and muscle mass (Fiedler, 2015). It is during these times that heart abnormalities usually come to light. The heart is able to function normally on a daily basis, however, it can not keep up with the pressure put on it, because a competitive sport can place a command on the volume and pressure of the heart (Rice, 2008). Not having the blood pumped properly or the oxygen delivered at the fast rates necessary causes the individual to pass out, collapse, or possibly pass away. Moreover, in the rare circumstances that these unfortunate events occur, there needs to be an immediate response to the situation. If immediate action is taken in the first couple of minutes, the chance of survival is 90%. If the proper help is not provided right away, the survival chance decreases by 10% every minute (Cardiac Health, n.d.). This becomes difficult considering the lack of training given to the coaches as only 29% of them have the proper CPR and basic first aid training (Solomon, 2017).

The majority may view sports through the competitive aspect, forgetting about the possible toll it can have on an individual's well being and health, specifically when it comes to cardiovascular diseases. It is important to balance between physical fitness to improve an individual's health and between their actual health. The health of individuals can only be improved to a certain point when using sports to do such, rather, when taken too far, it can lead to many health complications and start to affect the body in a negative way. This can fall under

the competitive sports used all over the states, which, if not brought attention to, can lead to more incidents of sudden cardiac-related deaths in sports fields.

Due to the different levels of competitiveness, it is standard to have different requirements based on which category of sport is desired. The requirements would be limited to the current optional form, usually required by schools, for non-competitive sports. This form would be sufficient because, since these sports do not have a high demand for the function of the heart, underlying cardiovascular issues will not be put into play. The heart will be able to maintain the relatively normal pressure put on it. However, the answers written on the sport form should be confirmed by the health professional, not just by the individual. Also, if there are any abnormalities detected by the health professional, further testing must be required.

On the other hand, competitive sports should require full heart testing prior to playing sports. This would be the best way to ensure the safety and health of an individual. This requirement would be fulfilled with an electrocardiogram, otherwise referred to as an EKG. According to the American Heart Association (2015), an electrocardiogram is a test that measures the electrical activity of the heartbeat. This is done by an electric impulse moving through the heart with every beat to the heart. The recorded reaction of the heart can help cardiologists conclude the pace of heart rhythms, fast, slow, abnormal, or normal. It can also determine if any parts of the heart are functioning improperly. This test identifies many cardiovascular problems such as myocarditis, coronary artery diseases, and dilated cardiomyopathy. An EKG can also identify hypertrophic cardiomyopathy, the most common cause of sudden death in young athletes at 36% (McKelvie, 2019; D'Silva & Papadakis, 2015). Hypertrophic cardiomyopathy is an exorbitant thickening of the heart muscle that can prompt an

unpredictable heartbeat called ventricular fibrillation which brings about no blood being pumped from the heart.

The cost of an EKG test would typically range from \$420 to \$1,100 in Michigan (New Choice Health, n.d.). However, these tests are covered in some insurance plans. Some plans cover only a portion of the cost while others cover the total cost. Usually, insurance health plans cover an estimate of 80% of the total. A few hospitals give a small discount for uninsured patients such as the Washington Hospital Healthcare System in California (Cost Helper, n.d.). Through Medicare, for example, this test would be covered with a referral from a doctor (Medicare, n.d.). In addition to that, taking into consideration the high prices of the EKG that can get too expensive for average families, there are current services in the state of Michigan that provide this exam for student-athletes at no cost. Beaumont and Mercy Health are two of the organizations willing to test high school student-athletes at no cost. The location, date, and what the exam encompasses is specified by each organization (Beaumont, 2017; Mercy Health, n.d.).

Preserving one's health is a crucial part of Islamic teachings. In Islam, the importance of preserving ones' health and body is at constant repetition throughout the Quran, Sunnah, and Ahadith as it is an obligation put upon Muslims. Hence, it is important to understand the importance of physical health while reminding fellow Muslims to be cautious with their actions because health is indeed a true gift from Allah (SWT) a believer should be grateful for. Moreover, Allah (SWT) granted man's physical form as a form of trust that needs to be fulfilled. Believers must act in accordance with that trust and avoid anything that will cause harm to the body to the best of their abilities. Sports is one of the many things proven as a beneficial way to maintain health.

On the topic of health, the Prophet (PBUH) said, ‘There are two gifts which many men are unmindful about – good health and leisure.’ (Bukhari). The Prophet (s.a.w) also encouraged his followers to pray for maintaining good health. In one narration he said, ‘Ask Allah for forgiveness and health.’ (An Nasai). In another it was narrated that there was once a Bedouin who asked the Prophet (s.a.w), saying, ‘O Prophet of Allah (s.a.w), what supplication shall I make to Allah after I have finished doing the Salah? The Prophet (s.a.w) said, ‘Ask for good health’ (Islam Information, n.d.). Based on these, it is safe to say that maintaining good health was indeed something the prophet (SAW) kept insisting on the believers as many seem to underestimate its importance to Allah (SWT). If any individual lacks in the caring of their health and wellbeing, then that can be interpreted as not appreciating the gift that Allah (SWT) is giving his believers, health. In many ways, that can be taken into different perspectives, but as believers, one of the most important ways to show gratitude to Allah (SWT) is by not allowing oneself to fall into destroying the health. This was prohibited in the Holy Quran ‘And do not throw yourselves into destruction.’ (2:195). The ayah focuses on projecting the image that believers should not comply with anything that could bring them harm or destruction. Failing to do so will result in the questioning of such matters and actions done otherwise on the Day of Judgement, ‘Then on that day (the Day of Judgement) you shall be asked about the favours (of Allah).’ (102:8).

Cardiovascular testing is an essential key in preserving the health of students, athletes, and individuals who are interested in participating in a sport. Sudden deaths or health complications that occur on the field due to underlying cardiovascular complications can be prevented if the necessary precautions are taken. Most of the time these deaths occur to

presumably healthy individuals. Proper screening identifies 3% to 10% of athletes at risk (Cardiac Health, n.d.). This percentage is relatively high, understanding that not all athletes are required to have heart screenings done before participating in sports. This percentage can be greatly maximized if the student is required to have completed a heart screening before being involved in any competitive sport. Every life is important and worth the extra step to protect it. Small overlooks such as these can cause families to lose their loved ones, hospitalizations, and many other unnecessary measures that can all be prevented.

References

About Cardiac Arrest. (n.d.). Retrieved from

<https://www.heart.org/en/health-topics/cardiac-arrest/about-cardiac-arrest>.

About Congenital Heart Defects. (n.d.). Retrieved from

<https://www.heart.org/en/health-topics/congenital-heart-defects/about-congenital-heart-defects>

Author James Long - Director of Foxes FC. (2018, October 16). Benefits of Competitive Sports for Children. Retrieved from

<https://www.thelittlefoxesclub.com/blog/benefits-of-competitive-sports-for-children/>.

Brindles Lee Macon and Kristeen Cherney. (2019, February 21). Congestive Heart Failure: Types, Causes, Stages, and Treatment. Retrieved from

<https://www.healthline.com/health/congestive-heart-failure>.

Beaumont Health. (2017, September 18). Beaumont offers free student heart checks at Bloomfield Hills High School. Retrieved from

<https://www.beaumont.org/health-wellness/press-releases/beaumont-offers-free-student-heart-checks-at-bloomfield-hills-high-school>.

Chabner, D. (2017). The language of medicine (11th ed.). St. Louis, MO: Elsevier.

Coronary artery disease. (2018, May 16). Retrieved from

<https://www.mayoclinic.org/diseases-conditions/coronary-artery-disease/symptoms-cause/s/syc-20350613>.

Crawford M. H. (2007). Screening athletes for heart disease. *Heart (British Cardiac Society)*, 93(7), 875–879. doi:10.1136/hrt.2005.085365

Davis, C. P. (2019, September 18). Heart Disease: Causes of a Heart Attack. Retrieved from

https://www.medicinenet.com/heart_disease_pictures_slideshow_visual_guide/article.htm.

[m](https://www.medicinenet.com/heart_disease_pictures_slideshow_visual_guide/article.htm).

Detroit, MI Heart EKG Cost Comparison. (n.d.). Retrieved from

[https://www.newchoicehealth.com/places/michigan/detroit/echo/heart-ekg-transthoracic-](https://www.newchoicehealth.com/places/michigan/detroit/echo/heart-ekg-transthoracic-echocardiogram)

[echocardiogram](https://www.newchoicehealth.com/places/michigan/detroit/echo/heart-ekg-transthoracic-echocardiogram).

D'Silva, A., & Papadakis, M. (2015). Sudden Cardiac Death in Athletes. *European cardiology*,

10(1), 48–53. doi:10.15420/ecr.2015.10.01.48

Electrocardiogram (ECG or EKG). (n.d.). Retrieved from

[https://www.heart.org/en/health-topics/heart-attack/diagnosing-a-heart-attack/electrocardi-](https://www.heart.org/en/health-topics/heart-attack/diagnosing-a-heart-attack/electrocardiogram-ecg-or-ekg)

[ogram-ecg-or-ekg](https://www.heart.org/en/health-topics/heart-attack/diagnosing-a-heart-attack/electrocardiogram-ecg-or-ekg).

Electrocardiogram Screening Coverage. (n.d.). Retrieved from

<https://www.medicare.gov/coverage/ekg-or-ecg-screenings>.

Fiedler, A. (2015, June 8). The Heart in Sport: What You Need to Know. Retrieved from

<https://blog.insidetracker.com/the-heart-in-sport-what-you-need-to-know>.

Florida Today. (2017, December 5). Rafe Maccarone's Obituary. Retrieved from

[https://www.legacy.com/obituaries/floridatoday/obituary.aspx?n=rafe-maccarone&pid=9](https://www.legacy.com/obituaries/floridatoday/obituary.aspx?n=rafe-maccarone&pid=99022820)

[9022820](https://www.legacy.com/obituaries/floridatoday/obituary.aspx?n=rafe-maccarone&pid=99022820).

Heart Arrhythmias. (n.d.). Retrieved from

<https://www.umcvc.org/conditions-treatments/heart-arrhythmias>.

Heart disease. (2018, March 22). Retrieved from

<https://www.mayoclinic.org/diseases-conditions/heart-disease/symptoms-causes/syc-20353118>.

How Much Does an EKG Cost? - CostHelper.com. (n.d.). Retrieved from

<https://health.costhelper.com/ecg.html>.

Islam Question & Answer. (n.d.). Retrieved from <https://islamqa.info/en>.

Kstp. (2019, October 14). High school football player who collapsed on field died of congenital heart disease. Retrieved from

<https://kstp.com/news/high-school-football-player-who-collapsed-on-football-field-died-congenital-heart-disease-esko-pfister/5524006/>.

Mercy Health. (n.d.). Free Student Heart Screenings. Retrieved from

<https://www.mercyhealth.com/find-a-service-or-specialty/heart-and-vascular-care/heart/free-student-heart-screenings>.

McCallum, B. (2019, June 14). Heart screenings to become mandatory for athletes at Florida high school district. Retrieved from

<https://usatodayhss.com/2019/athlete-heart-screenings-mandatory-florida-high-school-district>.

McKelvie, R. S. (2019, February). Sudden Cardiac Death in Athletes - Cardiovascular Disorders. Retrieved from

<https://www.merckmanuals.com/professional/cardiovascular-disorders/sports-and-the-heart/sudden-cardiac-death-in-athletes>.

MDHHS Safety & Injury Prevention Public Safety & Environmental Health Michigan Sports

Concussion Law. (n.d.). Retrieved from

https://www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_63943---,00.html.

Michigan High School Athletic Association History (MHSAA). (n.d.). Retrieved from

<https://www.mhsaa.com/About-the-MHSAA>.

O'Donnell, J. (2019, December 10). Why Non-Competitive Sports May Be a Better Option for Your Tween. Retrieved from

<https://www.verywellfamily.com/tweens-and-non-competitive-sports-3287962>.

Rice, S. G. (2008, April 1). Medical Conditions Affecting Sports Participation. Retrieved from

<https://pediatrics.aappublications.org/content/121/4/841.full>.

Sahih Bukhari (n.d.). Retrieved from <https://sunnah.com/bukhari/81/1>.

Saranac football player died from heart complications. (2019, August 30). Retrieved from

<https://www.wzzm13.com/article/news/local/heart-complications-led-to-saranac-football-players-collapse-death/69-f2083a24-618a-4f20-8ee8-b9e0a509a515>.

Solomon, J. (2018, November 13). 7 Charts that Show Why We Need to Fix Youth Sports.

Retrieved from

<https://www.aspeninstitute.org/blog-posts/7-charts-show-fix-youth-sports/>.

Sudden Cardiac Death of the Young (SCDY) Surveillance and Prevention Project. (2019, August). Retrieved from

https://www.michigan.gov/mdhhs/0,5885,7-339-73971_4911_4916_47257_59128---,00.html.

Sudden Death in Athletes. (n.d.). Retrieved from

<https://www.cardiachealth.org/palpitations/sudden-death-in-athletes/>.

Weinhaus, A. J., & Roberts, K.P. (2009). Anatomy of the Human Heart. In P. A. Laizzo (Ed.), Handbook of Cardiac Anatomy, Physiology, and Devices (pp. 51-52). New York, NY: Springer.

Why is physical activity so important for health and wellbeing? (n.d.). Retrieved from

<https://www.heart.org/en/healthy-living/fitness/fitness-basics/why-is-physical-activity-so-important-for-health-and-wellbeing>.

Young Athletes. (n.d.). Retrieved from

<https://www.your-heart-health.com/content/close-the-gap/en-US/heart-disease-facts/young-athletes.html>.