

Should High School Sports Physicals Include an Electrocardiogram?

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With tens of millions of high school and middle school students returning to school this month, many urgent care centers are embarking upon their annual sports physical campaigns. Assisting young athletes in achieving a medical clearance and completing their mandatory participation paperwork provides an opportunity for students and parents alike to become familiar with an urgent care center's facility, providers and staff. This orientation should lead to utilization later in the school year when injury or illness is bound to strike. In April, 2014, *JUCM—The Journal of Urgent Care Medicine* outlined this grassroots marketing tactic in "Marketing Strategies: School, Sports and Camp Physicals" (Link: <http://www.jucm.com/marketing-strategies-school-sports-and-camp-physicals/>).

Typically a sports participation physical entails a medical history and physical examination with the following goals:

- Determine that the athlete is in general good health.
- Assess the athlete's present fitness level.
- Detect conditions that predispose the athlete to new injuries.
- Evaluate any existing injuries of the athlete.
- Assess the size and developmental maturation of the athlete.
- Detect congenital anomalies that increase the athlete's risk of injury.
- Detect poor pre-participation conditioning that may put the athlete at increased risk.

Because the occurrence of significant health issues in this generally healthy population is low, some question the effectiveness and necessity of these exams. According to the American Academy of Family Practice, only 1-percent of athletes who are screened each year are disqualified from participation (<http://www.aafp.org/afp/2000/0501/p2683.html>). But when it comes to protecting the nation's youth, others are asking...are these exams sufficient?

Proposed legislation would make Texas the first state in the nation to require an electrocardiogram (ECG) in order to compete in high school athletics. The idea is that mandatory ECG screening could help save athletes' lives by detecting heart conditions early and preventing dangerous stress on their hearts. There is no question that sudden cardiac arrests in young athletes are a terrible tragedy, and an issue that should be addressed. However, there are pros and cons to requiring every athlete to have an ECG test, and many, including national physician groups, believe mandating an ECG is not the correct solution.

The widely held consensus among physician groups, including the American Heart Association and American College of Cardiology, is that mandated ECG screening is unwarranted. Proponents of the Texas legislation say the test is affordable, readily available, and would save lives. The opponents, though, cite physician shortages, likelihood of false positives, and inadequacy to detect some of the more deadly heart conditions as reasons why this proposed legislation is an inefficient way to address the risk that a student with a heart abnormality will die suddenly from various cardiac episodes and conditions.

The benefits of requiring an ECG test is that it is noninvasive and very easy to administer, and the results can be faxed or emailed to any cardiologist or pediatric cardiologist to be interpreted. Furthermore, the ECG test is an excellent way to identify electric disease of the heart, such as Long QT syndrome, Wolff-Parkinson-White syndrome, and Brugada syndrome. It can also detect hypertrophic cardiomyopathy (HCM), although much less effectively. The ECG test is relatively inexpensive, especially if school districts decide to purchase their own machines and screen their athletes. Finally, a basic physical, currently required for all student athletes, is not extensive enough to accurately identify some cardiac symptoms. Compounding that issue, a lack of knowledge or disclosure during the patient history and family history portion of the physical can further increase the chances of missing a heart condition. Proponents of the bill cite all of these reasons in support of the new law, but there are problems with this approach.

First, the ECG is insufficient for identifying hypertrophic cardiomyopathy (HCM), thickening of the heart muscle, which is the leading cause of sudden cardiac death in athletes. Along the same lines, the second-leading cause of cardiac death in student athletes, coronary anomalies, is undetectable by ECG. Additionally, the incidences of sudden death in athletes are rare. According to a national registry compiled by Barry Maron, head of the Minneapolis Heart Institute, from 1980 to 2006, there were only 1,049 deaths as a result of cardiovascular disease in 13-25 year-old athletes.

Critics, then, point to the lack of infrastructure in Texas to interpret the results of the close to 1 million high school athletes, and handle the inflow of potential patients, especially to detect something so rare. A related problem is that the ECG is far from perfect, and can generate up to 10% false positives. These false-positives would take playing time away from thousands of healthy athletes until expensive and time-consuming follow-up exams could be performed. These follow-up exams and tests would burden not only an already over-utilized healthcare system, but also the parents that end up paying for them. While the mandatory ECG screen is a good start to improving awareness of this issue, on further analysis it seems to be an inefficient approach to protecting student athletes. An improved screen is needed to realistically test the large number of athletes in Texas.

This bill has passed the Texas House of Representatives, and is pending in the Senate. Even if it does not pass, there are still ways to improve our ability to detect heart disease in student athletes during their pre-participation exam. Families and students must give honest, accurate, and complete answers to the personal and family history portions of the physical. This can help physicians identify known risk factors and take the appropriate action to help ensure a student athlete's safety.