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High School and College Athletes Should Be Required to Undergo Pre-Participation Cardiac Screening Prior to Participation in Competitive Sports

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Pre-Participation Cardiac Screening for Young Athletes

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Sudden cardiac arrest (SCA) is the leading cause of death in young athletes (Drezner et al., 2007). The incidence of SCA in young athletes is a concern not only for the medical community, but also for the community at large. Sudden cardiac arrest occurs when electrical impulses in the heart become rapid or chaotic, which causes the heart to suddenly stop beating. It is estimated that about 1 in 220,000 young athletes experience sudden cardiac death (SCD) each year (Baggish et al., 2010). Competitive athletes are considered to be one of the healthiest groups in society, and although sudden death during sports is rare, its occurrence is generally widely reported in the media, due to the age and apparently healthy condition of the athletes. The sudden and unexpected death of a young athlete can devastate families, other young competitors, and the community (Corrado et al., 2005). "Recent events in all parts of the world show that sudden cardiac death (SCD) of athletes is still a reality and it continues to challenge experts in cardiology which works with athletes" (Ferreira et al., 2010). When a young, seemingly healthy, young athlete suffers SCA there is an outpouring of grief and disbelief, but the issue of pre-participation heart screening does not gain traction. It is my contention that some simple pre-participation screening, including a physical, an Electrocardiogram (ECG/EKG), in addition to gathering an extensive family history, with a focus on relatives who died from sudden cardiac arrest or who suffer from heart disease, could have an enormous positive impact on this tragedy. In our family, we were fortunate that our son survived a cardiac event during a college baseball game in 2004. An ECG showed a cardiac abnormality, and subsequent testing revealed a diagnosis of a progressive heart disease, Arrhythmogenic Right Ventricular Dysplasia/Cardiomyopathy (ARVD/C). Although this diagnosis was a life-changing event for him, as well as for our

family, it could have very well had a tragic ending. In this paper I will explore the reasons pre-participation cardiac screening can be lifesaving for young athletes, as well as highlight the value of screening in comparison to the costs involved.

The highest number of sudden cardiovascular death events recorded in any single year was 76 (in both 2005 and 2006), followed by 66 in 1997 and 2002, and 64 in 1996 and 2001 (Maron et al., 2009). But these numbers are not reliable because there is no national reporting system at this time in the United States. Maron writes, "Only a national government–subsidized program with mandatory reporting, a centralized database, and dedicated resources would be capable of establishing the precise incidence of sudden death in young athletes in the United States."

According to a 2005 article written by Dr. Dominic Corrado, and published in The Lancet, "Genetic tests to allow for differential diagnosis are eagerly awaited. In the meantime, electrocardiograms can either suggest or identify the presence of up to 60% of the potentially lethal conditions associated with sudden death in athletes" (Corrado et al., 2005). He believes that cardiovascular conditions that predispose to life-threatening ventricular arrhythmias increase the risk for an athlete to suffer sudden cardiac death, more than the sport itself.

A recent study conducted in the United States using computer models from previous studies looked at the cost of adding electrophysiology testing to the usual pre-participation screening for athletes, compared to the benefits. It should be noted that the American College of Cardiology and the American Heart Association recommend only physical examination and a medical history be part of the pre-participation screening for athletes, but the European Society of Cardiology and the International Olympic

Committee believe the screening should include electrocardiography (ECG) to test for abnormal heart rhythms. The study concluded that the costs, compared to the savings in additional years of life, were well within what the US society is typically willing to pay for health care tests or treatments (Wheeler et al., 2010).

Another study, conducted by University Health Services at Harvard University in Cambridge, MA, studied 510 collegiate athletes who received cardiovascular screening prior to sports participation. The objective of the study was to compare the performance of pre-participation screening limited to medical history and physical examination with a strategy that integrates these with ECG. Each participant had routine history and examination-limited screening with ECG, and received transthoracic echocardiography (TTE) to detect or exclude cardiac findings with relevance to sports participation. In this study, cardiac abnormalities were observed in 11 of the participants with TTE. Screening with history and a physical alone only detected 5 of these 11 participants. Electrocardiography detected 5 additional participants with cardiac abnormalities (for a total of 10 of 11 participants), thereby improving the overall sensitivity screening to 90.9%. There was, however, a false positive rate of 16.9%, compared to 5.5% for screening with history and examination alone. The authors concluded that although a definitive conclusion regarding the effect of ECG inclusion on sudden death rates could not be made, adding ECG to medical history and physical examination improves the overall sensitivity of pre-participation screening in athletes (Baggish et al., 2010).

In 2007, Stanford University added computerized ECG screening along with the system-focused history and physical examination for its all athletes participating in intercollegiate athletics. All information was entered into a database for measurement of

the effectiveness of the addition of the ECG screening. The recordings were obtained from athletes representing 24 sports. Although 68% of the women had normal ECGs, only 38% of the men did. Of the 658 recordings that were obtained, sixty-three athletes (10%) were judged to have distinctly abnormal ECG findings considered possibly associated with conditions including Hypertrophic Cardiomyopathy (HCM), Biventricular Hypertrophy (BVH), or Arrhythmogenic Right Ventricular Dysplasia/Cardiomyopathy (ARVD/C). These athletes were offered further testing, but it was not mandated according to research protocol. From the results of this study the Stanford Sports Medicine program concluded that the mass ECG screening is achievable, and that the rate of secondary testing suggests the need for an evaluation of cost-effectiveness of mass screening as well as the development of a new athlete-specific ECG interpretation algorithms (Le et al., 2010).

The cost effectiveness question is looked at in a recent article in The American Journal of Medicine. The article looked at a recent study involving 964 student athletes enrolled at the University of Kansas. All athletes underwent 12-lead ECG's as well as echocardiograms. According to the authors, the concerns about cost effectiveness may be somewhat mitigated by recent data which shows that ECG screening is associated with 2.1 life-years saved per 1000 athletes, an incremental cost of $89 per athlete, and a cost-effectiveness ratio of $42,900 per life-year saved (Magalski et al., 2011). The article points out that pre-participation cardiac screening, including a 12-lead ECG, is not currently recommended or commonly performed in competitive athletes in the US due to cost, resource limitations, as well as potential for false-positive results. The authors believe that the study at the University of Kansas showed that this noninvasive screening

did in fact find ECG abnormalities in 10% of the athletes, excluding some from participation, and that no deaths have been reported in the population since the inception of the study.

According to an editorial written by Dr. Barry J. Maron, there are two primary prevention initiatives that have evolved to help create a safer athletic environment; pre-participation screening, and eligibility standards to prohibit athletes with identified cardiac abnormalities from participating in competitive sports (Maron, 2010). According to the Hypertrophic Cardiomyopathy Association website, Dr. Maron is the director of Hypertrophic Cardiomyopathy Center at the Minneapolis Heart Institute Foundation, and also maintains the Sudden Death in Athlete U.S. Registry. The registry includes 1,866 athletes in 38 different sports who died suddenly or survived cardiac arrest throughout the United States from 1980 to 2006. Of the deaths, 56% (1,049) were due to cardiovascular disease, many of which could have been could have been detected with an ECG. Dr. Maron asserts that "The low overall event rate reported should provide a general measure of reassurance regarding sports participation, but underscores the need for mandatory reporting of sudden deaths in young athletes" (www.4hcm.org).

Cardiologists in the US have looked at the mandatory national program in Italy for screening all competitive athletes. The screening in Italy, which is federally subsidized and began 27 years ago, includes a medical history, physical examination, and a 12-lead ECG. Any athlete identified with a cardiovascular disease is disqualified from participation. (According to a recent article in the *Miami Herald*, this screening program has reduced sudden cardiac arrest by 89% among young athletes.) Maron states that although there are some proponents of mass ECG screening here in the US, there are

those who question the use of resources, complexity of implementation, and societal influences. “A multitude of factors reinforce the impracticality of creating such a massive and expensive governmental program within the U.S. medical system, confined to only athletes and administered long-term.” He points out the there are a larger number of athletes in the United States who participate in high school and college sports programs, estimated at 15 million, and that although sudden deaths of young athletes is tragic, these events are uncommon in this country (fewer than 100 annually). Maron adds that there are a high number of false-positive ECG results (10%-20%), which ultimately promote inappropriate disqualifications, and unnecessary anxiety. He also believes the perception by some that the disqualification from sports would represent an infringement on individual liberty, and the freedom to assume personal risks, even for sudden death. Finally, he does not believe it is logistically possible to offer this testing to all young athletes; physician resources simply do not exist in this country. He concludes that although the ECG is a simple test, there are too many obstacles that prohibit the creation of a mandatory pre-participation screening program with ECG for young persons in competitive sports in the US (Maron, 2010).

Dr. Steven Fera, a Cardiologist practicing in Rhode Island, and an Assistant Professor of Medicine, Warren Alpert School of Medicine at Brown University, agrees with the current recommendations of the American College of Cardiology (ACC). He added that pre-participation cardiac screening is a topic that has been a great concern for pediatricians, educators, and policy makers. He believes the cost of screening everyone is quite high, and the yield is too low to be felt to be cost-effective by contemporary standards. He adds that minor abnormalities, which are commonly detected in this

screening, generate extreme anxiety and frequently lead to more costly and unnecessary testing. The ACC and others believe that a good family history and physical, with attention to any suspicious symptoms, findings on exam, and inquiring about a family history of unexplained sudden death or other unusual heart disease patterns. ECG and Echocardiogram would be ordered selectively based on these exams. He added, "I see the primary barrier to screening in the US as cost and liability. Training team physicians and similar non-cardiologist providers to provide these services and interpret EKGs may go a long way in expanding these services" (Fera, S., December 2012).

A study conducted by the Department of Cardiology at Tel Aviv University, Israel sought to estimate the cost of a national electrocardiographic (ECG) screening of athletes in the United States and the number of lives that would be saved by the program. The cost-projection model was based on the Italian study, and the size of the screening population was estimated from data provided by the National Collegiate Athletic Association (NCAA) and the National Federation of State High School Associations. The costs of diagnostic testing were obtained from Medicare reimbursement rates. The results of the study showed that a 20-year program of ECG screening of young competitive athletes in the United States would cost between $51 and $69 billion, and could be expected to save 4,813 lives. Accordingly, the cost per life saved is likely to range between $10.6 and $14.4 million. Their conclusion was that replicating the Italian strategy in the US would result in enormous costs per life saved (Halkin et al., 2012). However, if your child is one that is saved by pre-participation cardiac screening, is there any price that seems too much to pay for their life? Also, does it make sense to use reimbursement rates from Medicare for the study, when those rates could be excessive?

Dr. Robbie Foy, of the University of Leeds, UK, disagrees with Maron's assertions, using data from his experience with a screening program in suburban Chicago. The program, Young Hearts for Life, began in 2006, and has screened more than 45,000 high school athletes. He writes that although there are a larger number student athletes in the US than Italy, as a percentage of the population US athletes number about half that of Italy (5% in US vs. 10% in Italy). He added that the number of primary care physicians is about the same per capita in both countries. Foy also questions Maron's estimate of the number of sudden cardiac deaths annually. He writes that the statistic of less than 100 deaths per year is not based on a scientific registry like the Italian data, but merely on media reports. The concern about the high incidence of false-positive ECG interpretation is overstated in his view; he cites contemporary standards of 5% or less. He goes on to add that similar issues have not impeded testing in other areas of medicine (ex. mammography, and phenylketonuria screening in newborns). "The medical community's approach has always been to pursue improvements that reduce the false-positive rate through refinement in techniques and experience. It should be no different with ECG screening…Solutions to problems are not found by saying how we cannot achieve a worthy goal, but rather by asking how we can. Until we change this mindset, we will continue to unnecessarily lose too many of our precious youth to potentially preventable causes of sudden death" (Foy, 2010).

Dr. Corrado also points out in his article that a parallel study done in Italy showed that there were no deaths in symptom-free athletes who were correctly diagnosed with a hypertrophic cardiomyopathy and disqualified from competitive sports. The study proves that the identification and restriction prevented sudden death (Corrado et al., 2005). He

adds that because sudden and unexpected death in young athletes is such a devastating tragedy we should make every effort to increase awareness and implement comprehensive screening strategies to eliminate the risk.

At an August, 2012 meeting of the European Society of Cardiology Congress, Dr. Andrea Menafoglio of Switzerland reported that cardiovascular screening with ECG is a cost effective way of diagnosing cardiac abnormalities. Dr Menafoglio stated that at a cost of just €115 (~$150) per athlete, can prevent a substantial proportion of tragic cardiac deaths. Using data collected from a program in Switzerland that assessed competitive athletes aged 14-35 years using personal and family history, physical examination, and resting ECG. Between February 2011 and April 2012, 1070 athletes were examined. A total of 6.3% athletes required further examination, most due to abnormal ECG. A new, previously unknown, cardiac abnormality was found in 2% of the athletes. Without ECG, only .8% of the athletes would have been referred for further testing. He added that, even with the relatively high cost of medical services in Switzerland, cardiovascular screening with ECG of young athletes is feasible with few subsequent examinations, and at a low cost (http://www.medicalexpress.com/news)

If a child is diagnosed with a heart condition, there are many precautionary steps that can be taken to prevent the likely outcome of SCA including lifestyle modifications, medications, surgical treatments, and implanting a pacemaker and/or implantable Cardioverter defibrillator (ICD). Guidelines are available for the management of athletes with an identified cardiovascular disease in order to provide doctors with advice on the type and degree of sports activity that can be safely done by the individual (Corrado et al., 2005).

"The Implantable Cardioverter-Defibrillator (ICD), although initially designed as a treatment for older patients with coronary artery disease, has more recently proved to be a safe and effective therapeutic intervention in young patients with HCM, both for primary or secondary prevention of sudden death" (Maron & Spirito, 2008). They cite that the ICD was developed in the early 1980's by Drs. Michael Mirowski and Morton Mower, but it was not used for primary prevention until the 1990s. A number of controlled and randomized tests over the last 20 years have shown it to be superior to conventional antiarrhythmic medical treatments for both primary and secondary prevention of SCD. Finally, "Although definitive data are lacking and will require decades of observation to assemble, the available experience suggests that selected HCM patients protected from SCD by the ICD could potentially survive many decades of productive life, and even achieve normal or near-normal life expectancy, if not encumbered by other major HCM-related disease complications" (Maron & Spirito, 2008).

In a 2011 article published in *Circulation*, the authors believe that a more precise estimation for primary (screening) and secondary (emergency response planning) be considered. They conducted a study from January 2004 – December 2008, of all cases of sudden death in NCAA student-athletes. They utilized an NCAA database, weekly systematic search of public media reports, and catastrophic insurance claims. During this time period 273 deaths were reported, 187 (68%) were due to nonmedical or traumatic cases, 80 (29%) to medical causes, and 6 (2%) to unknown causes. Cardiovascular-related sudden death was the leading cause of death in 45 (56%) of the medical cases, and represented 75% of sudden deaths during exertion (Harmon et al., 2011). In their

conclusion they note that SCD is the leading medical cause of death in NCAA athletes, and that it occurs at a much higher rate than previously accepted. They believe that better methods of case identification should be developed. Because the study showed a higher incidence of SCD among black athletes and among basketball players, they believe that these high-risk athletes must be considered for ECG screening.

Since 2011, the NFL has included cardiac testing to their Scouting Combine. According to Richard Kovacs, MD, professor of clinical medicine at the Indiana University School of Medicine and clinical director of the Krannert Institute of Cardiology, "each year tests reveal problems serious enough for two or three players to be red-flagged as possibly needing additional evaluation before they can participate in the scouting combine workouts." This year at the combine in Indianapolis, 300 college football players received electrocardiograms and echocardiograms to determine whether any of them have anomalies that have gone undetected to this point in their athletic careers. The testing results are delivered to the NFL medical staff; the evaluators don't make recommendations, leaving the decisions regarding further testing to the NFL. The testing was conducted at the IU Health Methodist Hospital using loaned equipment and volunteer staff so as not to interfere with hospital operations. According to Dr. Kovacs, "about 400 athletes at all levels of sports die on the field or court each year in the United States, with an undetected cardiac anomaly being the most common cause." Although he is not sure whether screening everyone is the answer, Dr. Kovacs and his colleagues will meet with NFL officials to evaluate the screening program to see that it provides useful information in a cost-effective manner. (http://communications.medicine.iu.edu)

According to an August 8, 2012 article in the *Miami Herald*, "Screenings with EKG urged to protect young athletes from sudden cardiac death," sudden cardiac death claims about 500 young lives every year in the United States. The author, Howard Cohen, states, "In the U.S. there's a feeling there's a cost and it's not cost-effective. But if you are a family who has lost a child, statistics don't matter. In the U.S. we have the ability to identify more children who are at risk for sudden death but we don't implement it." He cites the Italian screening program and adds, in Japan screenings of the heart are mandatory for all students entering school, regardless if they are athletes. Because their data indicates every three days in the United States a young student athlete dies from sudden cardiac death (SCD) and experiences no prior symptoms, earlier this year the Miami Children's Hospital began offering free EKG screenings to all middle and high school sports participants. If they can diagnose and potentially save a child in adolescence, they believe it will add 40-60 years to their life. The cost of the screening is approximately $50 - $100 per child, but if a mass program were instituted, it is expected the cost would drop to $10 per child. Dr. Victoria Vetter believes that improvements in technology will reduce the current ECG costs. And she supports further studies to address the cost-effectiveness issue. She states there should be a commitment to obtain relevant data that will be accepted as applicable in the United States, with cost utility analysis, ones that can be supported with trials and scientific data (Vetter, 2009). I believe that if hospitals like Miami Children's Hospital can offer free screening, the idea that the cost to test high school and college athletes would be prohibitive, loses its meaning.

According to an August, 2012 article in The American Journal of Medicine, physicians need to understand that educational institutions have a responsibility to

student athletes regarding sudden cardiac deaths on the athletic field. It outlines medical and legal issues confronting physicians in the cardiovascular evaluation of competitive athletes. The authors believe that a better understanding of the roles of the physician can help protect themselves and the colleges from liability for negligent medical care. It is their contention that physicians involved with eligibility decisions in athletes with cardiovascular disease and pre-participation screening may assume some risk of liability. Finally, they believe that only a prospective, longitudinal study examining the impact of pre-participation ECG and cost-effective echocardiography will end the ongoing debate regarding the best way to reduce sports-related sudden cardiac death (Paterick, et al, 2012).

A 2009 article in *Pace* discusses pre-participation screening and pre-participation forms, and focuses on the lack of understanding in previously written articles. A quote from a 1996 study said there was limited value in pre-participation evaluation (PPE) for the identification of underlying cardiovascular abnormalities. But Dr. Robert Campbell disagrees and notes that over the past decade the knowledge around SCD and the role of PPE patient and family questionnaires, as well as a physical examination needs to be reevaluated (Campbell, 2009). Dr. Campbell believes that many patients affected by structural, functional, or primary electrical cardiac conditions making them predisposed to SCD, could be identified by a comprehensive and diligent PPE. He asserts that asking the family the right questions, in the right way, regarding patient/family history is critical; families must be educated on early warning signs and must take responsibility for the details of family history. In our family's case, only after the diagnosis was made did the Cardiologist asked a series of questions regarding Neil's history, as well as family history

regarding heart disease and SCD. At no time prior to this were we asked any questions along these lines, even though Neil played three sports in high school, and baseball in college. All that was required for participation in school sports was a physical performed by a physician. Although there were no cases in our families to link to Neil's disease, upon questioning Neil admitted to previous warning signs while participating in sports in high school. Neil had never reported any of these events to us, or to his doctor or a coach. It is my contention that it difficult to rely on this type of screening alone because this information is not regularly being sought prior to participation, not everyone has extended family health information, and it may not be enough to rely on a young athlete to relay previous events. Oftentimes an athlete, such as in Neil's case, would think that shortness of breath or dizziness could be attributed to overexertion. The Hypertrophic Cardiomyopathy Association has available on its website a downloadable Risk Assessment Form, which was created using recommendations from the American Heart Association, to help identify those at risk for sudden cardiac arrest (www.4hcm.org).

In a 2010 article in *Wiley Periodicals,* the authors write, "There are several minor coronary artery malformations which are harmless at rest, but can become fatal with exercise" (Smulevitz et al., 2010). According to the article 12% of sudden deaths among athletes are caused by these coronary anomalies. These coronary abnormalities differ from the previously discussed heart diseases that can cause deadly arrhythmias. To make their point they use the case of a sixteen-year old high school football player who experienced chest pain, but had normal blood pressure and ECG, and had no family history of myocardial infarction (heart attack). Only through the use of echocardiography was it confirmed that the athlete had an artery malformation. He was treated medically

and restricted from strenuous sports activity. They summarize by saying that limited echo imaging, in a cost effective manner, should be part of a comprehensive screening program for athletes.

An article in the most recent edition of *Current Opinion in Cardiology,* the authors reviewed the recent literature and recommendations for cardiovascular screening in young athletes. They pointed out that studies demonstrate the traditional history and physical-based examinations have a limited sensitivity, and do not detect the majority of athletes with at-risk conditions. They believe this may provide false reassurance for athletes with disorders that remain undetected. They continue, "Electrocardiogram (ECG) screening increases the sensitivity of the examination to detect disease, and cost modeling suggests protocols inclusive of ECG are the only screening strategies to be cost-effective" (Asif et al., 2013). The authors conclude that in order to avoid high false-positive rates it is essential that proper ECG interpretation that distinguishes physiological cardiac adaptations in athletes from findings suggestive of underlying cardiac pathology be utilized, and that greater physician education and research are needed for improvements to be made in the pre-participation examinations of athletes.

Because we lack a consensus in the medical community regarding pre-participation heart screening in the United States, what can be done to protect young athletes from sudden cardiac death? According to an article in *Heart Rhythm*, every school or institution that sponsors athletic activities should have a written emergency plan in place. The plan should be coordinated with the local Emergency Medical Services personnel, and be reviewed with each individual coach, athletic trainer, team physician, school safety personnel, and administrators (Drezner et al., 2007). Prompt recognition of

SCA is critical, and they add that any collapsed athlete who is unresponsive requires immediate assessment for SCA. Often SCA is misdiagnosed as a seizure and is not treated appropriately. In my son's case, he did not suffer SCA, but the cardiac event he experienced was diagnosed as a panic attack, even though he had never experienced one in the past. Even after an examination Neil's own physician did not refer him for further cardiac assessment. The fact that I work for a Fire Department with highly trained Emergency Medical Technicians may well have saved my son's life. When I spoke with a couple of them after the incident they strongly recommended I follow-up with a cardiologist. Trusting their judgment I requested an appointment for cardiac testing. Subsequently, Neil was diagnosed, placed on cardiac medication, and underwent surgery for the implantation of an Implantable Cardioverter-Defibrillator. Needless to say, competitive sports are no longer an option for him, but he knows he is lucky to be alive. In his words:

> When I look back at the time of my diagnosis, I realize I was naive about it; I didn't know how much it would change my life. I thought the hardest part was giving up playing baseball. But since I have lived with an ICD, and have experienced receiving shocks from it, I know that is the hardest part of the disease for me. Each time I receive a shock it takes time to recover physically and psychologically from it. In my mind I know I am fine, but I am nervous about the likelihood of a future event. The high heart rate does not make me afraid of dying while exercising, but I fear the pain of the shock. It reminds me that I no longer have control of my body and that is very hard to deal with (Harrington, N., December 2012).

With what I have learned since Neil's diagnosis, I believe that all school coaches and training staff should be trained in Cardiopulmonary Resuscitation (CPR), and have an AED available to be used by trained staff. Currently sixteen states have laws requiring or supporting schools have AEDs on site. According to the American Heart Association 89 percent of people who suffer an out-of-hospital cardiac arrest die because they don't receive immediate CPR from someone on the scene; cardiac arrest survival falls an estimated seven percent to ten percent for every minute without CPR. Defibrillation is the delivery of electric shock to restore the heart's normal rhythm. Early use of an AED is considered to be one the most critical link in the chain of survival for a victim of SCA. AEDs are lightweight, sturdy, and easy to use by anyone with training.

We do not have to look far to find cases of SCD in young athletes. In May 2005, Michael Monteleone, a 9th grade baseball player at Lincoln High School died while running at baseball practice. Michael was a healthy young person who excelled at sports, and was an honor student. A coach started CPR on Michael but was unable to revive him. There was no AED available at the field during athletic events. An autopsy determined that Michael had ARVD, which was undiagnosed at the time of his death (http://heartsafeaed.org/). Michael's family went on to start a foundation, which helped schools and youth sports groups throughout Rhode Island purchase AEDs.

In 2007, the American Heart Association in collaboration with the Rhode Island Department of Health's Heart Disease and Stroke Prevention Program created the Rhode Island HeartSafe Community Program. The initiative is based on the idea that lives can be saved by being prepared with prevention, early access to care, early CPR, early defibrillation, and early advanced care. The program uses a system of points, called

HERATBEATS, that a community earns by conducting CPR/AED training sessions in the community, equipping local law enforcement with AEDs, instituting effective emergency response plans in schools and municipal buildings (that may include CPR and AED), placing AEDs in the community (with appropriate trained personnel), dispatching Advanced Life Support with 12-lead ECG capability to appropriate emergencies, and having an ongoing process to evaluate and improve the "Chain of Survival" and overall cardiac health in the community. To date, five communities in Rhode Island have reached the goal of being named a HeartSafe Community: Westerly, Warwick, South Kingstown, East Providence, and Coventry. It has been a rewarding experience for me to serve on both the Heart Disease and Stroke Prevention EMS task force, as well as the East Providence HeartSafe Community Committee.

We do not have to wait for more information in a registry to determine how many young lives are lost, and families changed forever, before we make changes to the pre-participation screening of young athletes in this country. There is plenty of documentation regarding preventative testing for diseases that have had a positive impact on survival rates. The implementation of mammography and colonoscopy, for example, in diagnosing diseases in their early stages has saved many lives, and most insurance companies cover the cost of these tests, although some patients will have a co-pay. Many physicians already own the ECG equipment in their offices, so patients do not need to travel to a testing center to have the test completed. In addition, often a technician in the practice completes the testing, so the physician does not need to spend additional time on the appointment; the doctor can later do the analysis of the readout, and make

recommendations to the patient. Many health insurance plans cover the cost of ECG screening, although some require a co-pay.

Pre-participation cardiac screening of young athletes will save lives, and the longer we wait to gather statistics the more lives will be lost, and more families and communities devastated. The time to act is now. With the information currently available, a convincing argument can be made that saving a young athlete is worth the cost of screening, especially if that child is your own.

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