

Bobby Jindal
GOVERNOR



Bruce Greenstein
SECRETARY

State of Louisiana
Department of Health and Hospitals
Office of Public Health

January 30, 2013

The Honorable John A. Alario, Jr., President
Louisiana State Senate
P.O. Box 94183, Capitol Station
Baton Rouge, LA 70804-9183

The Honorable Charles E. Kleckley, Speaker
Louisiana State House of Representatives
P.O. Box 94062, Capitol Station
Baton Rouge, LA 70804-9062

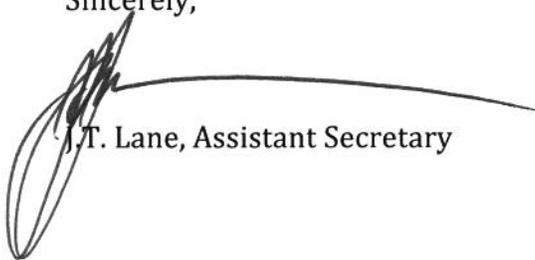
Re: House Concurrent Resolution No. 78 of the 2012 Regular Session

Dear President Alario and Speaker Kleckley:

The Louisiana Department of Health and Hospitals is submitting the attached Heart Disease in Student Athletes Report in response to House Concurrent Resolution 78 of the 2012 Regular Session regarding the feasibility of requiring all high school and college athletes to be screened for early detection of heart disease.

If you need additional information, please contact me directly at jtlane@la.gov or at (225) 342-8093.

Sincerely,



J.T. Lane, Assistant Secretary

HEART DISEASE IN STUDENT ATHLETES

REPORT PREPARED IN RESPONSE TO (HCR
78) OF THE (2012) REGULAR SESSION

JANUARY 2013

Contact:

Louisiana Department of Health and Hospitals

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EXECUTIVE SUMMARY

During the 2012 legislative session, House Concurrent Resolution 78 was enacted requesting the Louisiana Department of Health and Hospitals to lead a committee to study the feasibility of requiring all high school and college athletes to be screened for early detection of heart disease.

Sudden cardiac arrest is the most common cause of death in the United States and is considered to be the leading cause of death in young athletes. This report provides information and recommendations towards the viability of requiring screenings for athletes in Louisiana. It also includes a recommended pilot study titled "*Smart Heart.*" The pilot study seeks to identify abnormalities that could provoke disease progression or sudden death.

REPORT FROM THE STUDY COMMITTEE ON HEART DISEASE IN STUDENT ATHLETES

INTRODUCTION

During the 2012 legislative session, House Concurrent Resolution 78 was enacted requesting the Louisiana Department of Health and Hospitals (DHH) to lead a committee to study the feasibility of requiring all high school and college athletes to be screened for early detection of heart disease. Sudden cardiac arrest (SCA) is the most common cause of death in the United States and is considered to be the leading cause of death in young athletes ^(1, 2). The National Athletic Trainers' Association (NATA) estimated the incidence of sudden cardiac death (SCD) in high school athletes to be 1:100,000 – 200,000, with the rates for collegiate athletes to be higher at 1:65,000 - 69,000 ⁽³⁾. An in-depth study of SCD rates among NCAA athletes estimated to be actually closer to 1:43,000 with the most severe rates occurring among African American athletes (1:1,700) and male basketball players (1:7,000) ⁽⁴⁾. As there is currently no mandatory national reporting system for SCA and SCD among student athletes, it is also surmised that these rates are underestimated.

Preliminary data from 2011 indicates that there were 49 deaths among Louisiana residents aged 19 to 25, and 22 deaths among 12 to 18 year olds, with the cause of death being heart disease related. It has been reported by the DHH Center for Vital Records and Statistics that for 12 to 18 year olds, 15 out of the 22 were found to have heart disease as the underlying cause, and for 19 to 25 year olds, 22 out of the 49 total had heart disease as the underlying cause. Prompted by the growing risks associated with this chronic illness, as well as numerous incidents of tragic student athlete deaths throughout the state, the Louisiana Legislature requested the compilation of a committee comprised of designated staff from the DHH Bureau of Primary Care & Rural Health, a member of the Louisiana High School Athletics Association, a cardiovascular physician approved by the Louisiana State Board of Medical Examiners, a member of the Louisiana Athletic Trainer's Association, and a member of the Governor's Council on Physical Fitness and Sports to review, assess, and evaluate potential strategies emphasized by the American Heart Association in preventing further incidence of SCA among the state's youth.

TIERED RECOMMENDATIONS

The committee developed a list of five possible recommendations for prevention of SCA in student athletes. The recommendations were then grouped by feasibility of implementation (High – Low) into three tiers:

- *Tier I : Standardized Forms/Prescreening; Mandated Education/Training*
- *Tier II : AEDs & Training*
- *Tier III: EKG Screenings; Electronic Medical Records*

Details about each recommendation including advantages, disadvantages and costs are outlined below and summarized in Table 1.

Tier I Recommendations (high feasibility of implementation)

Standardized Forms/Prescreening (G. Stewart, M.D., personal communication, December 2012)

The purpose of screening is to provide medical clearance for participation in competitive sports through routine and systematic evaluations intended to identify clinically relevant and preexisting cardiovascular conditions and thereby reduce the risks associated with organized sports. Utilizing prescreening for competitive athletes has the potential to increase the detection of cardiac irregularities and lower the risks associated with athletic participation. The American Heart Association (AHA) has concluded that complete and targeted personal and family history and physical examination designed to identify or raise the suspicion of those cardiovascular diseases known to cause sudden cardiac death or disease progression in young athletes represent the most practical screening strategy for implementation in large populations of young competitive sports participants. The AHA recommends that competitive athletic prescreening follow a 12-step outline consisting of a targeted personal history, family history and physical examination^(5,6). The elements within the outline - including information regarding a history of elevated systemic blood pressure, knowledge of certain cardiac conditions in family members, and the presence of a heart murmur – are designed to assist in identifying, and raising suspicion of, cardiovascular diseases for certain athletes who are at risk. In 2005, AHA recognized 48 states as having adequate prescreening and questionnaire processes, with 39 states complying with at least nine of the 12 outline elements.

However, several studies have demonstrated the limitations of using history and physical examination alone for pre-participation cardiac screening. The ability of history and physical alone to detect subclinical cardiac disease is currently considered to be low. Although the limitations of the history and physical alone would seem to demand the inclusion of additional tools for screening, the issue of sudden cardiac death among athletes should ultimately be considered in the context of overall public health. Among causes of death for people under 35 years of age, sudden cardiac death is only slightly more frequent than lightning strike fatalities.

According to the Louisiana High School Athletic Association, all interscholastic athletes must complete either the LHSAA Medical History Evaluation Form or the Louisiana School Entrance and General Health Exam Form and pass a medical examination administered by a licensed physician, a licensed nurse practitioner that is in collaboration with a licensed physician, and/or a licensed physician's assistant under the supervision of a licensed physician **prior to the first time** he/she **practices or participates** in a sport at an LHSAA school in order to be eligible for athletic competition⁽⁷⁾. While LHSAA's medical eligibility requirements and prescreening statutes allow the state to fall under adequate fulfillment of the AHA's screening recommendations, there still exists a need for the development of a standardized system that confirms compliance and verification of accurate prescreening methods on a continuous basis. This would ensure that proper guidelines are being followed regarding how prescreening questions and responses are addressed to make certain the true value of the history and physical examination is realized, and all student athletes participating in competitive events are medically cleared.

As such, it has been determined that the competitive athlete prescreening should consist of a targeted personal history, family history and physical examination. This includes 12 key prescreening elements such as a history of elevated systemic blood pressure, knowledge of certain cardiac conditions in family members, and the presence of a heart murmur that are designed to identify, or at least raise the suspicion of, cardiovascular diseases that place certain athletes at risk. Those athletes with positive findings should be referred for further evaluation and testing. This medical evaluation should be

performed by a qualified examiner and should be conducted in a physical environment conducive to optimal auscultation of the heart.

All forms used and accepted in the State of Louisiana should be standardized and include the following:

Personal History

1. Exertional chest pain or discomfort
2. Unexplained syncope or near-syncope
3. Excessive exertional and unexplained dyspnea or fatigue, associated with exercise
4. Prior recognition of a heart murmur
5. Elevated systemic blood pressure

Family History

6. Premature death before age 50 years due to heart disease in a relative
7. Disability from heart disease in a close relative less than 50 years of age
8. Specific knowledge of any cardiac conditions in family members

Physical Examination

9. Heart murmur (auscultation in supine and standing)
10. Femoral pulses to exclude aortic coarctation
11. Physical stigmata of Marfan's syndrome
12. Sitting brachial artery blood pressure.

Such an approach is an obtainable objective and should be mandatory for all competitive athletes before their initial engagement in organized sports. Comprehensive screening evaluations should be administered every other year for high school athletes. However, if it is unclear whether an athlete has been screened, then annual screenings should be performed. The additional associated costs for this approach would be minimal. This is currently the accepted standard of care, and as such, there would be very little additional requirements. This approach is in place for pre-participation physical examinations by the Louisiana High School Athletic Association.

In summary, based on current national recommendations and consensus, pre-participation cardiac screenings should be performed on all potential middle and high school athletes using standardized assessments as outlined above.

Mandated Training for Coaches, Administrators, Parents, and Athletes (G. White, R. Castle Ph.D., personal communication, November 2012)

Educational training related to prevention of sudden cardiac death (and cardiovascular conditions) has several facets as a preventative tool. Educational training components should address anatomy, physiology, typical signs and symptoms of cardiac-related conditions, early detection techniques (information obtained through the PPE; past family history; current medical history; etc); and initial treatment steps; as well as prevention steps (e.g., nutrition; proper conditioning; annual physical examinations; etc.).

Parent and Athlete Educational Training

The continuum of prevention should address initial education of parents and athletes prior to sports participation, followed with a focus on detection, treatment, and preventative measures for all schools (coaches, administrators; medical personnel). Act 352: Comprehensive Sports Injury Management Program (§1299.181) was enacted during the 2011 legislature and section B states that "*The injury management program shall: (4) Require that each coach or official in school-sponsored or school sanctioned athletic activities receive documented training regarding the nature and risks of serious sports injuries.*" Additionally, section 5(C) states that "*The school shall ensure that before a student is allowed to participate in any school-sponsored or school-sanctioned athletic activity, the student and the parent or guardian of the student shall document that they have viewed information, provided in written or verifiable electronic form by the school or school district, regarding risks of serious sports injuries.*" This educational training of the parents and athletes could involve viewing an online video module and/or viewing and educational pamphlet combined with submission of a signed statement on knowledge of cardiac events.

Educational training could involve all parents and athletes viewing an online video module and/or viewing and educational pamphlet combined with submission of a signed statement on knowledge of cardiac events.

Athletic Staff Educational Training

Critical aspects of educational training are already addressed through certification training obtained in Standard First Aid, Cardiopulmonary Resuscitation (CPR), and Automated External Defibrillation (AED) coursework. The certification training does address how to recognize the acute (sudden) onset of signs and symptoms related to cardiovascular conditions as well as initial life-saving techniques. Statistical evidence for cardiac-related deaths in high school and college athletes in Louisiana, as well as nationwide, are typically revolved around physical exercise as the precipitating trigger mechanism. Such evidence has been widely publicized in recent cardiac-related deaths in Louisiana athletes, including those of Shannon Veal of Glen Oaks High School and "Burke" Cobb of Dutchtown High School, each of whom developed a catastrophic cardiac event during and/or shortly after intense athletic competition/training. Early recognition and intervention are well-proven measures in the chain of survival for cardiac events, as without these steps the end-result is potential death. Immediate intervention increases the chance of survival along with advanced medical intervention (hospital care).

Even though First Aid/CPR/AED training for coaches primarily addresses most components of the areas previously identified, the education is significantly lacking in nutritional and conditioning concepts. Many coaches do not have formal educational training basic concepts of sports diet/nutrition and principles of conditioning. Addressing these areas will facilitate and promote their educational efforts back to the parents and athletes, as well as developing effective techniques/policies that may prevent the onset of serious cardiac-related conditions.

High School Coaches and Supervisors: Mandatory Training (R. Castle Ph.D., personal communication, November 2012)

It is highly recommended that all coaches and supervisors of extracurricular activities (e.g., cheerleader sponsors/coaches; band supervisors/directors) obtain and maintain current certification in Standard First Aid, CPR and AED use. In Louisiana, there is no mandate for all coaches and supervisors to obtain and maintain certification in First Aid/CPR/AED, but a school is required to have at least one coach or supervisor with a given team to possess the certification. If the designated coach is not present

at a given practice, conditioning activity, or game (and the other coaches are not properly trained), then the risk of catastrophic cardiac event, as well as other serious injuries, cannot be adequately managed. This deficit in consistency in coaches training alone warrants a high recommendation that all coaches (and extracurricular activity supervisors also) obtain and possess current AHA or ARC certification in Standard First Aid/CPR/AED use. The cost of training is approximately \$25 to \$50 per participant, and is valid for a two-year period.

College-level Coaches and Strength Conditioning Staff: Mandatory Training

- ***National Collegiate Athletic Association (NCAA) Institutions***

Regarding intercollegiate athletics, the NCAA has varied mandates related to required sports safety training for coaches, strength and conditioning staff, and other staff. According to the 2012 - 2013 NCAA Sports Medicine Handbook ⁽⁹⁾ the following requirements are in place for coaches and support personnel:

- Division I – No requirements for First Aid/CPR/AED training
- Division II - Each head coach and all other coaches who are employed full time at an institution shall maintain current certification in first aid, CPR and AED use.
- Division III - Each head coach shall maintain current certification in first aid, CPR and AED use.

While typically the NCAA Division I schools do have greater resources at their disposal, which includes an increased number of athletic trainers (AT) who are physically present at practices and games, there are sports at all NCAA levels in which the coaches and support personnel would be required to intervene in case of an emergency. This discrepancy creates an unnecessary burden on schools and gives way to an unsafe sports environment for athletes in which a cardiac event may occur. It is recommended that all coaching staff and supervisors obtain and maintain First Aid/CPR/AED training at all NCAA institutions in Louisiana.

List of NCAA Member Institutions in Louisiana by Division Level:

Division I Institutions		
Grambling State University	Louisiana State University	Northwestern State University
University of Louisiana at Lafayette	Louisiana Tech University	Southeastern Louisiana University
University of Louisiana at Monroe	McNeese State University	Southern University (Baton Rouge)
McNeese State University	University of New Orleans	Tulane University
Louisiana Tech University	Nicholls State University	Northwestern State University

Division II Institutions	Division III Institutions
N/A	Centenary College
	Louisiana College

- **National Association of Intercollegiate Athletics (NAIA) Institutions**

According to the NAIA website and related manuals, there are currently no mandated requirements for athletic coaches and strength conditioning coaches to obtain and maintain current certification in Standard First Aid, CPR and AED by the AHA or ARC. However, in the 2012 - 2013 NAIA Athletic Trainers Association handbook ⁽¹⁰⁾, it was noted that in their June 2012 Annual Meeting in St. Louis that a motion was introduced and passed to require at least one coach of each team to be trained in CPR and AED training. While this does support the NAIA membership in recognizing the need for CPR and AED training, there is currently no mandate. It is highly recommended that all NAIA member institutions in Louisiana require all athletic coaches and strength conditioning coaches to obtain and maintain Standard First Aid/CPR/AED training through the AHA or ARC. Below is the current list of NAIA Member Institutions in Louisiana:

- Dillard University
- LSU – Alexandria
- LSU – Shreveport
- Loyola University
- Southern University – New Orleans (SUNO)
- Xavier University

- **National Junior College Athletic Association (NJCAA) Institutions**

The NJCAA does not require any of its coaches (full-time; part-time; volunteer; student) or strength conditioning staff (full-time; part-time; volunteer; student) of its member institutions to possess and maintain certification in Standard First Aid/CPR/AED.

Below is the current list of NJCAA Member Institutions in Louisiana:

- Baton Rouge Community College
- Bossier Parish Community College
- Delgado Community College
- Southern University at Shreveport

- **National Christian College Athletic Association (NCCAA) Institutions**

The NCCAA does not require any of its coaches (full-time; part-time; volunteer; student) or strength conditioning staff (full-time; part-time; volunteer; student) of its member institutions to possess and maintain certification in Standard First Aid/CPR/AED.

There are currently no NCCAA institutions in Louisiana.

Concerns:

- Verification that all coaches and supervisors (both at the high school and college level) maintain current certification in Standard First Aid/CPR/AED
- Costs associated with requiring all coaches to obtain appropriate certification in high schools, however, this is a minimal expense of less than \$1000 over a two-year period (considering an initial certification of 33 coaches at \$25/per coach)
- Cost should not be a factor for intercollegiate athletic institutions due to increased access to revenue and resources.

Recommendations:

- In Louisiana high school athletic settings, all coaches (full-time; part-time; student; and volunteer) and supervisors (band; cheer; dance) as well as strength conditioning coaches must obtain and maintain current certification in standard first aid/CPR/AED.
- For all intercollegiate athletic institutions in Louisiana, all coaches and strength conditioning coaches (full-time; part-time; volunteer; student), must possess and maintain current certification in standard first aid/CPR/AED by the ARC or AHA.
- All future position vacancy notices for coaches and supervisors of athletic events (including extracurricular activities in high schools) must provide a provision that the applicant must possess and maintain current certification in Standard First Aid/CPR/AED by the ARC or AHA. This will place the responsibility of the job applicant to ensure he/she possesses the appropriate emergency care certifications as well as increase the importance of his/her role in overall sport safety.

Below are options to consider for verification purposes:

- Consider a random audit process whereby a designated agency (or external group) is required review the status of all coaches and supervisors (at high schools and colleges) in Louisiana with the Legislature determining an appropriate penalty/fine for failure to comply with the mandate
- Develop an online reporting tool that the athletic director (or his designate) at each school (high school and college) is required to update, maintain, and assure compliance with the policy mandate. This online reporting system would also provide public access for continued accountability.
- All schools must implement an emergency action plan (EAP) that includes mandatory training and certification updates, as well as action plans for addressing cardiac-related events. The EAP will also document when and who evaluates compliance and review of all emergency care plans for all athletic events and venues of the host institution.

Tier II Recommendations (moderate feasibility of implementation)

AEDs / Training (G. White, R. Castle Ph.D., personal communication, November 2012)

An automated external defibrillator (AED) is a lightweight, portable device that delivers an electric shock through the chest to the heart. The shock can stop an irregular rhythm and allow a normal rhythm to resume in a heart in sudden cardiac arrest. It is imperative that the heart be “defibrillated” quickly, because a victim’s chance of surviving drops significantly for every minute a normal heartbeat is not restored. AEDs make it possible for more people to respond to a medical emergency where electric shock of the heart is required. Due to their portability and ease, AEDs can be used by trained nonmedical

personnel, and be included in emergency response programs that also make use of prompt CPR and 911 emergency contacts. These three activities are essential to improving survival from cardiac arrest. They are safe to use when provided the proper training, as studies have shown that AEDs are able to detect a heart rhythm that should be defibrillated 90 percent of the time, and 95 percent of the time they are able to recommend not shocking someone when a defibrillation is not indicated ⁽⁸⁾.

Training for AED use is easily obtained. The AHA and ARC teach AED training as a component of the CPR certification training. The LHSAA currently recommends that each sport have a designated coach to be trained and certified in CPR, which would also mean that they are also trained and certified in the use of an AED.

The cost for an AED has decreased over the past few years, but some schools still may not have the funds to purchase an AED. These schools could apply for grants or conduct a fundraiser to generate the amount necessary to purchase an AED. The price of an AED varies by make and model. Most AEDs cost \$1,500–\$2,000. There are no requirements or needs as the AHA and ARC already have the infrastructure in place to provide all the information, staffing, training equipment, etc. to conduct a training program.

Tier III Recommendations (low feasibility of implementation)

EKG Screenings (J. Deumite M.D., F.A.A.C., personal communication, November 2012)

Sudden death in athletes, though extremely rare (approximately 1 in 300,000 high school athletes) affects individuals, school staff and students, and communities on a very personal level, and raises both practical and ethical issues regarding prevention. The vast majority of these catastrophes are cardiac in nature. Though the 26th Bethesda Conference provides consensus guidelines on the participation or disqualification from competitive sports, the vast majority of these student athletes have only undergone a screening physical examination, which short of detecting some type of heart murmur or abnormal pulse or blood pressure, is unlikely to detect the culprit cardiac abnormality lurking beneath the surface, and consequently results in an opportunity lost.

There are no universally accepted screening practices. For the most part high school athletes undergo a screening physical exam. Most college athletes undergo a physical exam, ECG, and sometimes echocardiography. Most professional athletes undergo all three. A physical exam alone has a very low specificity regarding detection of the majority of cardiac abnormalities contributing to sudden death.

Cost effectiveness for the most part guides the approach. Ideally, ECG, echocardiography, and DNA testing for specific abnormalities contributing to sudden cardiac death would be ideal, but obviously is cost prohibitive. Considering approximately 100,000 high school student athletes in Louisiana grades nine through 12, echocardiography at an estimated \$600 per study would cost \$60,000,000 the first year and \$15,000,000 yearly thereafter, considering only the new ninth graders would need screening thereafter. DNA testing at approximately \$1,000 per test to screen for three of the most common arrhythmic etiologies of sudden cardiac death would cost \$300,000,000 the first year and \$75,000,000 yearly thereafter.

With those impractical costs in mind, ECG screening, though imperfect, will identify 95 percent of student athletes with hypertrophic cardiomyopathy representing the majority of sudden deaths at 36 percent, and most cases of Wolff Parkinson White Syndrome, long QT syndrome, arrhythmogenic right ventricular dysplasia, coronary anomalies, and dilated cardiomyopathies, all of which represent another 30

percent of the causes, and consequently ECG screening would identify about 2/3 of those potentially at risk. The limitation lies in the inability to detect the other 1/3 of the etiologies, as well as in the resultant false positive results obtained in screening such large populations. This could subsequently lead to more testing and increased individual costs, though practically those additional costs would be borne by insurance coverage. Regarding cost, at \$45 per ECG, the total cost to screen the initial 100,000 student athletes would be \$4,500,000 the first year and \$1,125,000 yearly thereafter.

Organized ECG screening by local cardiology groups or hospitals on a voluntary basis may substantially reduce these costs. "The American Heart Association recommends that some form of pre-participation cardiovascular screening for high school and collegiate athletes is justifiable and compelling, based on ethical, legal, and medical grounds. Noninvasive testing can enhance the diagnostic power of the standard history and physical examination; however, it is not prudent to recommend routine use of such tests as 12-lead ECG, echocardiography, or exercise testing for the detection of cardiovascular disease in large populations of young or old athletes. This recommendation is based on both practical and cost-efficiency considerations. This viewpoint, however, is not intended to actively discourage all efforts at population screening that may be proposed by individual investigators."

In summary, the ultimate costs of universal screening to prevent a relatively low frequency event must be balanced against the society's willingness to prevent such an uncommon personal tragedy.

Rani G. Whitfield, a Baton Rouge family physician, author, and national medical radio correspondent recommends a pilot study to examine the effectiveness and feasibility of incorporating onsite EKG and ECHO screenings as part of the prescreening process for competitive high school athletes. The pilot study, titled "*Smart Heart*," was developed by Whitfield in honor of student athletes who died from heart disease including Shannon Veal – Capitol High School; Tyrone Duplessis – Louisiana Tech; and Burke Cobb – Dutchtown High School.

"Smart Heart" Pilot Program

Cardiovascular pre-participation screening is the systematic practice of medically evaluating large, general populations of student-athletes prior to participation in sports for the purpose of identifying or raising suspicion of abnormalities that could provoke disease progression or sudden death (AHA Scientific Statement 2007). *Smart Heart* is a free screening program. The purpose of the program is to:

1. Identify pre-existing, asymptomatic heart conditions;
2. Reduce the number of sudden cardiac deaths among young athletes in Baton Rouge;
3. Educate the community about these potentially life threatening disorders.

Screening of the athletes will take place at _____ (to be determined by sponsor who elects to conduct a pilot) and include a signed consent form, medical history questionnaire to be completed prior to the day of the exam, blood pressure measurement and an electrocardiogram. Individuals with an abnormal ECG or EKG, will undergo a brief screening echocardiogram under the supervision of a cardiologist. If an abnormality is discovered from the echocardiogram, the student-athlete will be referred to their physician for further evaluation. The student-athlete cannot be cleared to play without a written statement from a physician and re-evaluation by the screening cardiologist.

"*Smart Heart*" can be done as a one day event or over several days during the summer months prior to 2-a-day football practice and the start of the school year. Date, time, and location of the

event should be determined and sent to the schools prior to the end of the school year with reminders sent to coaches, athletic directors, and directors and principals two weeks prior the scheduled event.

Athlete screening with an electrocardiogram is currently mandated in Italy and Israel, and it is endorsed by the International Olympic Committee and the European Society of Cardiology. The American Heart Association supports screening with a personal and family history questionnaire, and also acknowledges the logistical and financial challenges of mass screening programs in the United States.

The “*Smart Heart*” committee believes strongly that screening young people for heart disease is important and can save lives. Health care providers will donate their time to support Smart Heart.

- Event
- Date: TBD
- Time: 8am-5pm
- Location: TBD
- Items Needed: 4 - EKG Machines, 2 Echocardiograms, Physicians, Nurse Practitioners, Nurses, Physician Assistant, Volunteers, Parents (for 300 athletes you would need approximately 10 physicians and 10 support staff along with 6 techs- 4 for ECG/EKG and 2 for Echo)
- Evaluation to include
 - a. Medical History
 1. Pre-printed questionnaire
 2. Completed and signed by both parent and student-athlete
 - b. Vital Sign Monitoring- clinical staff will obtain blood pressure and review medical history
 - c. ECG/EKG performed at rest; patches on the surface of skin. This test maps the rate, rhythm, and functions of the heart and prints a tracing for the physician to review and interpret.
 - d. Physical Exam- Performed by a physician or Nurse Practitioner.
 - e. Echocardiogram- if needed based on ECG/EKG interpretation; an echocardiogram is an ultrasound of the heart

Potential Schools for the Pilot

1. **Arlington Preparatory Academy** - 931 Dean Lee Drive, Baton Rouge, LA 70820 **PH** 225-766-8188, **FAX** 225-757-1276
2. **Baton Rouge Magnet High School** - 2825 Government Street Baton Rouge, LA 70806 **PH** 225-383-0520, **FAX** 225-344-3066
3. **Belaire High School** - 12121 Tams Drive, Baton Rouge, LA 70815 **PH** 225-272-1860, **FAX** 225-272-3782
4. **Broadmoor High School** - 10100 Goodwood Boulevard, Baton Rouge, LA 70815 **PH** 225-926-1420, **FAX** 225-928-5472
5. **Glen Oaks High School** - 6650 Cedar Grove Drive, Baton Rouge, LA 70812 **PH** 225-356-4306, **FAX** 225-359-6782
6. **Lee High School** - 1105 Lee Drive, Baton Rouge, LA 70808 **PH** 225-383-7744, **FAX** 225-346-8196

7. **McKinley High School** - 800 East McKinley Street, Baton Rouge, LA 70802 **PH** 225-344-7696, **FAX** 225-387-5435
8. **Northdale Academy** - 10755 Cletus Drive, Baton Rouge, LA 70815 **PH** 225-272-2036, **FAX** 225-273-2125
9. **Northeast High (7-12)** - 13700 Pride Port-Hudson Road, Pride, LA 70770 **PH** 225-654-5808, **FAX** 225-654-5591
10. **Scotlandville Magnet School of Excellence** - 9870 Scotland Avenue, Baton Rouge, LA 70807 **PH** 225-775-3715, **FAX** 225-774-3767
11. **Tara High** - 9002 Whitehall Avenue, Baton Rouge, LA 70806 **PH** 225-927-6100, **FAX** 225-928-0122
12. **Valley Park Alternative Center** - 4510 Bawell Street, Baton Rouge, LA 70808 **PH** 225-926-9765, **FAX** 225-926-8758
13. **Woodlawn High** - 15755 Jefferson Highway, Baton Rouge, LA 70817 **PH** 225-753-1200, **FAX** 225-751-9269

Electronic Medical Records (G. Stewart, M.D., personal communication, December 2012)

An electronic medical record (EMR) is a digital version of the traditional paper-based medical record for an individual. The EMR represents a medical record within a single facility, such as a doctor's office or a clinic. An electronic health record (EHR) is an official health record for an individual that is shared among multiple facilities and agencies. An EHR focuses on the total health of the patient—going beyond standard clinical data collected in the provider's office and inclusive of a broader view on a patient's care. They are designed to reach out beyond the health organization that originally collects and compiles the information. They are also built to share information with other health care providers, such as laboratories and specialists, and contain information from all the clinicians involved in the patient's care. The EHR represents the ability to easily share medical information among stakeholders and to have a patient's information follow them through the various modalities of care engaged by that individual.

Health care is a team effort and shared information supports that effort. After all, much of the value derived from the health care delivery system results from the effective communication of information from one party to another and, ultimately, the ability of multiple parties to engage in interactive communication of information.

With fully functional EHRs, all members of the team have ready access to the latest information allowing for more coordinated, patient-centered care since with EHRs:

- Information gathered by the primary care provider tells the emergency department clinician about the patient's previous cardiac status, so that care can be adjusted appropriately, even if the patient is unconscious.
- There is the ability to exchange records between different EMR systems would facilitate the coordination of healthcare delivery in non-affiliated healthcare facilities.
- They can make health care more efficient and less expensive, and improve the quality of care by making patients' medical history easily accessible to all who treat them.

The major disadvantages of the EHR with regard to the current issue are access and costs. All health care entities, including athletic trainers, must have access to these highly protected private documents. This means that high school athletic training rooms will also eventually need to be classified as health care locations. High startup costs are also a prohibitive factor for the current project.

In summary, the EHR presently has not matured to the point that it can be helpful in the current circumstances. However, in the future, this will allow communication between all health care providers, even at the time of the pre-participation physical examination. At that point, any previous cardiac findings or testing will be immediately available to those performing the evaluation.

Table 1: Recommendations

Strategy	Costs	Benefits	Concerns	Feasibility
Standardized Forms/Prescreening	<i>Free</i>	Ensures accuracy and validity of medical clearance of the athlete Could bring awareness to other unknown illnesses athlete may be unknowingly at risk for	Verification methods would need to be adopted to ensure compliance	High
Mandatory Staff Certification/Education	<i>\$25 – \$50 per participant</i>	Improve knowledge of nutrition/conditioning associated with cardiac related issues Increase number of trained staff certified in CPR/First Aid	Costs could be prohibitive factor for public institutions Verification methods would need to be adopted to ensure compliance	High
Mandatory Education (Athletes/Parents)	<i>Free</i>	Improve personal awareness of cardiac related issues/risks associated with intense athletics Grow knowledge of detection, treatment, and prevention	None	High
AED Placement/Training	<i>\$1500 – \$2000 per device</i>	Improve immediate survival rate from SCA event Safe to use Easy access to training	Costs could be prohibitive for some schools	Moderate – High

Strategy	Costs	Benefits	Concerns	Feasibility
EKG/ECHO Screenings	ECHO = \$60 million start; \$15 million per year EKG = \$4.5 million start; \$1.125 million per year	Could accurately ID at least 2/3 of potential athletes at risk for SCA	Accessibility due to costs. Access in rural areas. Potential false positives; higher individual care costs.	Low
Electronic Medical Records	N/A *	Readily available access would enhance health-care delivery to athletes across the state Could better efficiency of delivery and lower medical costs	Startup Costs estimated as high All training rooms would need to establish medical clearance	Low

**No exact numbers estimate on costs (predicted as high due to startup development IT costs)*

CONCLUSION

Numerous student athletes in Louisiana have lost their lives to sudden cardiac arrest, often the result of hidden, undiagnosed heart conditions. As a result of House Concurrent Resolution 78 of the 2012 legislative session, a study committee was formed to make recommendations regarding the detection and prevention of heart disease in student athletes. The committee drafted a list of five recommendations:

- 1) Standardized Forms/Prescreening;
- 2) Mandated Education/Training;
- 3) AEDs & Training;
- 4) EKG Screenings;
- 5) Electronic Medical Records.

Based on research and costs, two of the recommendations seem most feasible for Louisiana: Standardized Forms/Prescreening and Mandated Education/Training. There are little or no costs associated with these strategies, but they have the potential to help prevent the deaths of our student athletes.

Acknowledgments

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