



Life is normal now for Chris Giovannetti (left) and his mother, Valentina. But he was just 15 when an undiagnosed heart condition caused him to suffer a life-threatening seizure while running on this track at Leota Jr. High in Woodinville

SHOCK TO THE SYSTEM

Could the solution to healthy kids dying on the athletic field be a simple hand-held electronic device? BY ELIZABETH M. ECONOMOU

IN JUNE 2006, 15-year-old Christopher Giovannetti was in gym class at Woodinville's Leota Junior High School, running around the track and looking forward to summer vacation. Suddenly, the freshman passed out. When his fitness teacher Melissa Barnum got to him, Giovannetti was having a seizure. She and co-teacher Ron Saario checked Giovannetti's breathing and pulse, and Barnum performed three to four rounds of rescue breathing while Saario fetched an automated external defibrillator, or AED. Fortunately, Barnum revived Giovannetti before paramedics arrived, and before having to use the AED. ¶ Giovannetti was later diagnosed with arrhythmia—an abnormality resulting from a malfunction in the heart's electrical system. Doctors at Seattle Children's hospital implanted a heart monitor during a four-hour operation; last July, doctors gave Giovannetti a clean bill of health and removed the device from his chest after having it implanted for more than two years.

Sudden cardiac arrest (SCA)—a condition in which the heart suddenly goes into an abnormal and potentially lethal arrhythmia, causing blood to stop flowing to the brain and other vital organs—is the leading cause of death in young athletes. Every three days a young athlete passes away from SCA in this country. Overall, it kills some 325,000–350,000 people in the United States every year. Ninety-five percent of them die within minutes. And in most cases, victims were otherwise healthy and unaware of their condition and had no apparent risk factors, which makes diagnosis virtually impossible.

Jonathan Drezner, M.D., who holds a sports medicine fellowship and is an associate director in the department of family medicine at the University of Washington, researches these types of attacks in young people and believes the numbers of young people affected are even greater. “This figure reflects only young competitive athletes, not all children, like the kids just exercising in the park,” he says. In other words, if you added to that all active kids—not just athletes—it would be between 200 and 300 additional cases per year, he says. While these numbers are relatively small, they are especially tragic given the age of the victims.

The condition, in most cases, isn't preventable, but there is growing evidence suggesting that having an AED on hand—a hand-held, computer-like device used to shock the heart back into a normal, healthy rhythm—could improve the odds for stricken students. But today, only about 54 percent of Washington state's 400 or so comprehensive high schools—serving grades 9 through 12—have on-site defibrillators. According to Drezner, most of those devices were donated and implemented without a well-coordinated emergency plan.

An AED is about the size of a laptop computer and relatively easy to use. The device—applied to the victim's chest—monitors the heart's rhythm for any abnormalities, and if necessary, directs the rescuer to deliver an electric shock to the victim. AEDs range in price from about \$1,500 to \$2,600 and vary according to manufacturer and model.

Drezner, 38, published a study last June

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in the *HeartRhythm Journal* that found young athletes and young active individuals have a mere 11 percent chance of surviving sudden cardiac arrest. “If you think about it, it's the most precious part of our population,” says Drezner.

Having someone do good CPR can expand that window a little bit, says Drezner. “But by far the single most important factor in treating victims of sudden cardiac arrest is that interval to defibrillation,” he says. “If we can reach people within three minutes from their collapse, which is what happens when you have on-site defibrillators, you get survival rates over 50 percent to 60 percent,” he says, a statistic backed by another study he's conducted that is pending official publication.

Defibrillation is also the only treatment for ventricular fibrillation (VF), a condition that Drezner says accounts for 75 percent of all SCA cases. With this condition, the heart quivers and stops contracting which causes a disruption of blood flow to the brain and other vital organs. VF is characterized by uncontrollable twitching or quivering of muscle fiber in the lower chambers of the heart.

During the 2007 state legislative session, Representative Ross Hunter (D–48th District), a member of the Appropriations Subcommittee on Education, introduced HB 1429, which would have required all public high schools in Washington state to have on-site AEDs. Hunter, whose district serves several neighborhoods on the Eastside, says while he was heartened early on by the science supporting HB 1429, he subsequently ran across another study that caused his enthusiasm to fizzle. That study, whose co-authors included a number of Harborview Medical Center physicians, found that most incidents of SCA at schools involved adults; because of the low incidence of SCA among students, the cost of adding AEDs to every

school isn't necessarily warranted. Dr. Tom Rea, a co-author and physician at Harborview, concluded, “The decision to employ a school AED program must factor in many considerations. This study attempts to give health officials and policymakers the information they need to make informed decisions.”

Drezner and others, including Bellevue resident Darla Varrenti—the mother of Nick Varrenti, a high school football player who died of SCA in 2004, shortly after moving from this area to live with his father in Pennsylvania—believe that decision should come down on the side of putting AEDs in every high school and are leading a legislative push. But while Hunter says he's willing to reintroduce a new bill to get AEDs in schools (at an estimated cost of \$2 million to \$3 million every two years for the devices and training for coaches, teachers and administrators, with costs dropping significantly after all schools have the devices), the chances of getting such a bill through the Legislature in the current economic climate are slim. “We don't get to buy everything we want,” he says, noting that he has to balance the health needs of students with paramount academic issues like purchasing new math books.

Meanwhile, the Office of Superintendent of Public Instruction (OSPI) has, so far, remained on the sidelines of this issue. Gayle Thronson, OSPI Health Services program supervisor, says outgoing Washington state schools Superintendent Terry Bergeson “has been neutral on past legislation in this arena.”

Compared to other parts of the country, Washington state fares only average when it comes to AEDs in public high schools. And that's surprising, considering it was Seattle's Dr. Mickey Eisenberg, professor of medicine at the University of Washington and medical director of King County Emergency Medical Services, who

initiated the concept of early defibrillation 28 years ago and whose landmark study changed the protocol for emergency response teams and emergency dispatch centers across the country. “AEDs in schools have the potential to save the lives of students as well as adults,” says Eisenberg. In addition, many companies specializing in AEDs, such as Bothell-based Cardiac Science Corporation and Philips Medical Systems, are headquartered here.

Texas, for example, is very proactive with AEDs, says Drezner. He notes that during the summer of 2006, the Lone Star state had four student athletes suffer from SCA within a three-week period; three died and one survived. “That caused a great movement,” he says.

No one is hoping for similar incidents to galvanize legislators here to take action. But these are exactly the tragedies that local proponents want to prevent. Drezner concedes that legislators have to make tough decisions with limited resources, but also believes it's only a matter of time before all Washington state high schools embrace AEDs. “When you present the numbers and the magnitude of the issue, and how life-saving AEDs are, you don't have to convince anyone that they work,” he says. 5

NICK OF TIME FOUNDATION

Since the untimely death of her son Nick in 2004, Bellevue resident Darla Varrenti and her family have turned their pain into action, creating the Nick of Time Foundation (nickoftimefoundation.org) in 2006, which Varrenti oversees as president and executive director. NOT's mission is to raise awareness of SCA in children and young adults through education, legislation and cardiac screenings. While AEDs may be most important for students on the athletic field, they may come into play for other reasons as well. “So often our schools are used as community centers and gathering places for families in times of emergencies,” she says.