Polk County, Florida
The heart of Florida

If your image of Florida is miles of leafy orange groves speckled with ripening fruit, chances are you're picturing Polk County. Located in the heart of Florida, Polk County ranks first in the state for citrus grove area, and second in amount of farmland. Covering an area roughly the size of Delaware, Polk County has many attractions, like the historic Bok wildlife sanctuary, that draw tourists from across the country.

But what makes Polk County truly the heart of Florida has more to do with healthcare than geography. Community leaders are working towards a common goal of making Polk County a safer place for victims of sudden cardiac arrest.

The risks of cardiac arrest

Cardiac arrest occurs when the heart abruptly stops functioning. The American Heart Association estimates that cardiac arrest causes 325,000 deaths annually out-of-hospital or in the Emergency Department, accounting for 13.8 percent of all deaths in the United States.[1] That means someone in the U.S. dies as a result of cardiac arrest every two minutes.

The most common underlying cause of cardiac arrest is coronary heart disease. Although a heart attack can lead to cardiac arrest, the two are not the same. Most often, the immediate cause of cardiac arrest is ventricular fibrillation (VF), in which the heart muscle beats irregularly. Only a shock from an automated external defibrillator (AED) can stop VF and restore a normal heart rhythm. After cardiac arrest, each minute that passes before defibrillation decreases a victim's chance of survival by seven to ten percent.[2,3] Administering cardiopulmonary resuscitation (CPR) lessens this decline to three to four percent per minute, but CPR alone cannot restore a normal heart rhythm.[2,3]

PHILIPS

Early defibrillation, early treatment

Polk County EMS: early defibrillation, early treatment

Polk County has a population of more than 560,000. From 22 strategically located stations, Polk County EMS operates 29 Advanced Life Support (ALS) units 24 hours a day, with an additional 3 ALS units during the business day. Polk County EMS responds to approximately 72,000 events and transports some 58,000 patients to medical facilities each year. The Service has had monitor/defibrillators on board their ambulances since the early 1980s, and Philips HeartStart MRx monitor/defibrillators in every ALS ambulance since 2005.

The MRx has a two-fold function on board Polk County ambulances. First, paramedics use it to defibrillate patients suffering from VF to restore a normal heart rhythm—and get blood pumping through the body again. And second, they monitor a patient's electrocardiogram (ECG) en route to aid early diagnosis of the heart's underlying condition. That saves crucial time once the patient arrives at the hospital.

Programs in partnership

In an impressive feat of coordination across County departments, Polk County EMS has partnered with the school district, the county administration offices, county fire departments, and sheriff's office to deploy early defibrillation programs.

Says EMS Director Harvey Craven, "We're partners. We support each other's programs, and if there's anything we can do to help, we will." This spirit of partnership among first responders is a model for large, diverse communities with complex, overlapping emergency response systems.

Eleven ALS fire engines countywide have a HeartStart MRx monitor/defibrillator on board, and share medical direction with Polk County EMS.

Statistics

Population:
561,606

Dates of implementation:
2003–2007

Trained responders:
EMTs and paramedics, firefighters, sheriff's deputies, school staff and other citizen responders

Number of defibrillators:
686

Location of defibrillators:
Ambulances, ALS trucks, all sheriff's deputies' cars, schools and athletic fields, school district offices, county administration offices, private businesses

The HeartStart MRx is a key survival tool in Polk County EMS ambulances.

Polk County Agencies have come together to save lives in the community. Pictured here, Fire Chief David Cash, EMS Director Harvey Craven, and Sheriff Grady Judd.

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EMS Director Harvey Craven

Polk County EMS has also been instrumental in starting an AED program at the Sheriff's office. The Sheriff's AED program enables EMS to send out an alert for the nearest deputy when it receives a cardiac call, potentially saving crucial minutes to defibrillation.

For the County Administration building, Polk EMS purchased HeartStart FRx defibrillators, oversaw their installation, and pays for ongoing employee training. EMS also helped the school district choose the best locations for their FRx defibrillators. The compatibility between the FRx and the MRx monitor/defibrillators on board the ambulances is a major advantage. According to Craven, "We don't need to rip their pads off to put ours on. We just unplug theirs, and plug them into the MRx. That's awesome." Thanks to this compatibility, "we can get the data we need as easily and quickly as possible to provide the right care."

AEDs take the field

The Florida High School Athletic Association ruled in 2005 that all schools hosting a sporting event at the district level or higher needed to have an AED on site. This move, along with Florida's 2006 law requiring all high schools belonging to the Athletic Association to have AEDs, prompted the Polk County School District to look into AEDs for its schools. Since July 2006, the District has installed 159 Philips HeartStart FRx defibrillators in schools and on athletic fields. "I'm always looking for that red case at the sidelines," says Christy Johnson, RN, resource specialist/trainer of health services and prevention education.

The district plans to put two AEDs in each of the county's 18 high schools and its technical schools, one per elementary and middle school, and one in the district offices. They will train one school nurse, two secretaries and three administrators at every site.

School AED program put to the test

On May 16, 2007, physical education teacher David Aaron of Winter Haven High School was talking with two other teachers when he collapsed. Thinking fast, the teachers started CPR and called to the clinic for the school's AED. When the clinic's aide attached the AED, it indicated that Aaron's heart needed a shock. Following defibrillation, his pulse returned.

Once paramedics arrived, they connected the pads from the school's HeartStart FRx defibrillator to their Philips MRx monitor/defibrillator, which allowed them to monitor Aaron's ECG during transport to Winter Haven Hospital.

Aaron now has an internal defibrillator and walks two and a half miles every day. He says, "I'm just getting stronger every day." His only regret, in fact, seems to be his new diet. "All the stuff you like to eat, I can't eat anymore."

There's no doubt in Aaron's mind that the school's AED saved his life. "Thank God they had it. I'd have been graveyard dead without it." Having come through this experience, Aaron is now a staunch advocate of AEDs. "They ought to have them everywhere there's a big crowd. There's no reason not to. My life's worth whatever they paid for it—to me at least!"

The save was also a major success for the District's newly implemented AED program. "I am really glad that it worked," says Christy Johnson, speaking of the emergency protocol. "There was no hesitation to put it on and use it," thanks to the District's AED training. And now the AED program has won committed supporters in the faculty and staff of the school. "After using the AED, I think everybody there is a believer," Johnson says. Five staff and faculty members involved were honored with certificates of recognition by the school board for their decisive action in saving Aaron's life.

Christy Johnson, RN, resource specialist and trainer of health services and prevention education, Polk County Schools.

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Philips HeartStart AEDs: Performance and simplicity

When the time came in 2003 to upgrade the monitor/defibrillators in the county's fleet of ambulances, EMS Director Harvey Craven says, "We evaluated everything and really liked Philips—and it has worked out well for us." Polk County EMS became one of the first departments in the U.S. to adopt the Philips HeartStart MRx.

The MRx had "the monitoring options available that we felt we needed," says Craven, including the ability to read all 12 ECG leads at once. Polk County paramedics are trained to read ECGs and to recognize the changes indicating ST segment elevation myocardial infarction (STEMI). With this vital information, medics can make more effective treatment choices in the ambulance and, with the patient's consent, change the transport destination to one of the county's three cardiac centers.

At one of these centers, a patient whose STEMI has already been detected can bypass the ED and go straight to the cath lab. This can significantly reduce discovery-to-balloon time—and improve the patient's chance of survival.[5]

Philips MRx also comes with Q-CPR™, a device that can guide trained responders delivering CPR. Developed by Laerdal and Philips, Q-CPR provides real-time audio and visual feedback, helping ALS responders achieve the optimal depth of compressions, as well as frequency and quality of ventilations. Q-CPR also collects CPR performance data for retrospective review so rescue teams can later identify areas for improvement.

Outside the ambulance, Philips HeartStart FRx combines proven defibrillation technology with remarkable ease of use, making it the AED of choice for Polk County's mobile units. SMART Biphasic defibrillation technology is at the core of Philips HeartStart AEDs. The biphasic waveform delivers a highly effective defibrillation shock that is designed to minimize post-shock trauma to the heart.

HeartStart defibrillators feature clear, calm voice commands and descriptive visual icons to lead trained responders through resuscitation, giving them the power to save lives.

"We want to offer the best care in confronting acute coronary syndromes...Philips met our needs."

Dr. Greg White, Medical Director, Polk County EMS

A new beat for deputies

With 408 cars on the street, a deputy is likely to be the first responder in any emergency. That's one reason why Sheriff Grady Judd outfitted each deputy's car with a Philips FRx defibrillator, and mandated that all deputies have up-to-date American Heart Association certification in CPR and AED use. According to Deputy David Chant, training coordinator for the Polk County Sheriff's Office, the AED program "offers the community someone who has the potential to be a first responder, who could be trained to have the AED in place before EMS gets there."

Since receiving their first 99 AEDs from Polk County EMS in December 2006, more than 500 of Polk's 572 sworn officers have been trained, with ten deputies having been certified to train others. "The training overall has been taken with a positive attitude. They see the importance of it," Deputy Chant reports. "The AEDs themselves are pretty foolproof," he adds. They "pretty much walk you right through."

The Polk County Sheriff's Office provides law enforcement for the whole county, and is the primary service responder in unincorporated areas—that's 1,909 of the county's total 2,010 square miles. Given its wide geographical range and large number of trained officers, the Sheriff's AED program has the potential to help save many lives that would otherwise be lost to cardiac arrest.

Deploying AEDs in deputy vehicles saves crucial minutes when they arrive first on the scene of a cardiac call.

Saving an officer's life

October 24, 2007, saw a dramatic demonstration of the Sheriff's AED program in action. Police dog teams from across the country had converged on Lakeland, in Polk County, for the national U.S. Police Canine Association field trials. The Polk County Sheriff's Office fielded a team, and Deputy Kenny Knox and Sergeant Dan Cone were on hand to cheer them on.

In one exercise, canine teams were "apprehending" Deputy Tyson Choquette, who wore protective gear. At around 10 a.m., Sergeant Terry Couch of the Iowa State Department of Corrections had completed the exercise and left the field, when Choquette noticed Couch's dog Dargo acting erratically on the sidelines.

Though no one had witnessed Sgt. Couch's collapse, those nearby could see that the officer was immobile and needed medical attention. But they soon found that helping him was going to be difficult—Dargo, a Belgian Malinois, was protecting his fallen partner.

"The deputy's dog was protecting him; that's his job. He wouldn't let anyone near him," said Polk County Sheriff Grady Judd.

Choquette, with his protective gear already on, approached Dargo, and the dog attacked. Officers were then able to draw the dog away and restrain him.

Deputy Sheriff Paul Leslie, with the K-9 trauma kit and oxygen tank; Deputy Sheriff Tyson Choquette, wearing the K-9 training sleeve; Sergeant Dan Cone with the HeartStart FRx Defibrillator; and Deputy Sheriff Kenny Knox. Together, they were responsible for saving the life of an Iowa corrections officer during a canine competition in Lakeland.

With Dargo out of the way, well-trained responders could reach Couch, whose face was turning purple. Deputy Knox, a CPR instructor for the Polk County Sheriff's Office, and Leslie Johnson, an ER nurse from North Carolina who came to support her husband in the competition, administered CPR. Sgt. Cone rushed to his car to get the defibrillator he had been trained to use the previous December. Another deputy retrieved a K-9 trauma kit with an oxygen tank and masks for dog and handler.

"They saved his life," according to Judd.

Cone connected the defibrillator to Couch and, following the instructions it gave, delivered two shocks. Following the shocks, Couch was revived and able to speak with his rescuers and EMS personnel when they arrived. One spectator said, "The hairs stood up on the back of my neck", watching the sergeant regain consciousness after being defibrillated.

Sgt. Couch was taken to Lakeland Regional Medical Center. Competition participants started a collection to fly Couch's wife and son to Florida to visit him in the hospital. Couch made a full recovery, and returned home to Iowa in early November.

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Teaming up for the common good

Polk County's business community is starting AED programs, too. And these programs have a strong supporter in EMS Director Craven. "What's of major importance is that AEDs need to be in private businesses, in shopping areas, in public places. I'm sold that AEDs need to be there," he says.

From corporate AED programs to advanced technology for ALS responders, Polk County is primed to respond to cardiac arrest—and to keep the heart of Florida beating.

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EMS Director Harvey Craven

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