

## A town with a shocking history

Benjamin Franklin—printer, inventor, diplomat, Founding Father—ventured out of Philadelphia regularly to visit his daughter in Bensalem, a small town on the Delaware river to the northwest of the city. It was on one of these trips in 1752 that Franklin reportedly conducted his famous kite experiment, proving that lightning is an electrical spark on a spectacular scale.

Of course, had Franklin conducted the experiment as legend has it, he would have received a shock strong enough to stop his heart. So it is strangely fitting that Emergency Medical Services (EMS) and the Bensalem community partner today to help improve the chances of survival for victims of sudden cardiac arrest (SCA).

Bensalem Township thrives on the intersection of its rich history and thoroughly modern present. The town was founded in 1692, only eleven years after William Penn received his land grant and named

the colony Pennsylvania. Bensalem was the site of one of the nation's first shopping malls, Neshaminy Mall, built in 1968. Today, the recently completed Philadelphia Park Casino and Racetrack has sparked further development and added to the town's appeal.

Home to nearly 60,000 residents, Bensalem has gone through dramatic changes since EMS chief Thomas Topley arrived in 1985. "It used to be a small bedroom community for Philadelphia," Chief Topley says. "One of the things that's impressed me most over my 20 years here has been how much the town has grown."

But Bensalem has kept its small-town character. "It's a tight-knit community," says Chief Topley. "Pretty much everyone knows each other." This small-town familiarity is apparent on the streets of Bensalem Township, where members of the community frequently take the time to catch up.

# It's all about saving lives

It's also part of the reason that the partnership between EMS and the community at large has been so successful. The people of Bensalem all have a stake in the success of a program that strengthens the community's emergency response—because when SCA strikes, the whole community is affected.

In April 2007, at the Bucks County EMS Chief's Association breakfast, Mayor Joseph DiGirolamo and Philips Medical Systems received a citation for Bensalem's innovative community outreach program.

## The risks of sudden cardiac arrest

The American Heart Association estimates that SCA causes 250,000 out-of-hospital deaths every year in the United States.<sup>1</sup> That means someone dies as a result of SCA every two minutes.

SCA is often followed by ventricular fibrillation (VF), in which the heart muscle beats irregularly, failing to pump blood to the rest of the body. Only a shock from a defibrillator can stop VF and restore a normal heart rhythm. Each minute that passes before defibrillation decreases the victim's chance of survival by seven to ten percent.<sup>2,3</sup> Administering cardiopulmonary resuscitation (CPR) until defibrillation lessens this drop

to three to four percent per minute, but CPR alone cannot restore a normal heart rhythm.<sup>2,3</sup>

A recent study found that public access programs that train lay volunteers in Automated External Defibrillator (AED) use in addition to CPR drastically improve survival rates over CPR-only programs.<sup>4</sup> Programs that put AEDs in highly visible public areas, paired with AED training for professional and lay first responders, have the potential to decrease the mortality rate for SCA nationwide. Bensalem Township, through the efforts of Chief Topley, Mayor DiGirolamo, and others, has instituted just such a program.

## Statistics

### Population:

58,434

### Year of implementation:

1999

### Trained responders:

EMTs and paramedics, firefighters, police officers, citizen responders

### Number of AEDs:

50+

### AED locations:

All ambulances, police cars, and fire marshal vehicles; fire trucks; city municipal offices; athletic fields; schools; private businesses; Commerce Bank Amphitheater; Philadelphia Park Casino and Racetrack.



All-Terrain Vehicles operated by Bensalem EMS are equipped with defibrillators.



Philips Q-CPR helps guide trained responders giving CPR.

### A partnership for life

Chief Topley started Community Outreach and Public Education (COPE), in 1999. The program began as an effort to improve the community's response to emergencies through education, including first aid, CPR, and AED training. "We wanted to partner with the community so they would feel ownership for EMS," says Chief Topley.

Four police cars received AEDs in 1999 as the first step in introducing AEDs into the community's emergency response system. Now, Bensalem Township has more than 50 AEDs, according to Fred Harran, Director of Public Safety. They are in every ambulance, police and fire marshal's car, and all

but one fire truck. Two daycare facilities, the Commerce Bank Amphitheater, Philadelphia Park Casino and Racetrack, Bensalem school district, and local athletic organizations all have AEDs.

Through COPE, Bensalem certifies nearly 7,000 emergency personnel and lay responders per year. A training course for the town's Scouts earns them a merit badge. In addition to CPR and AED training, Bensalem EMS also offers training for Q-CPR, a Philips device that helps responders to administer CPR correctly.

Steven Moran, who was Director of Public Safety when the AED program was first implemented, says AED training adds a valuable

skill for first responders. "You have to be able to perform the best service you can with the skill sets you have," says Moran. "AEDs add skill sets to help save lives."

For local businesses that want to start an AED program, EMS offers direction and training. Bensalem EMS also provides maintenance for the town's AED units, replacing defibrillation pads as they expire, for example. According to Moran, "It's a critical positive step for your employees. And the life that's saved could be your own."



"If you have the equipment, the potential is there to save a life."

Sgt. Mike Marren,  
Bensalem Police Department



For the town's popular Bensalem Fall Festival at the Commerce Bank Amphitheater, EMS outfitted two All-Terrain Vehicles with AEDs and the Philips MRx, a combined defibrillator and patient monitor. The presence of these high-visibility vehicles raised awareness for the

COPE program. Since they could go anywhere on the fields, even where ambulances could not, the All-Terrain Vehicles also insured that EMS could respond to any emergencies in the crowd of 12,000 revelers.

## Philips HeartStart AEDs: Performance and simplicity

Philips HeartStart AEDs combine proven defibrillation technology with remarkable ease of use, making them the AEDs of choice for Bensalem Township.

SMART Biphasic defibrillation technology is at the heart 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 the process of defibrillation.

Sgt. Mike Marren of the Bensalem Police Department is also an EMT and helps to train his fellow officers in CPR, first aid, and AED use. Sgt. Marren reports that the HeartStart defibrillator is "very easy to use" and that Chief Topley and the others involved with choosing Philips AEDs "did their homework very well." With a police force of 105 officers,



Sgt. Marren says, "I've never had anyone say they don't understand this. It walks you through from the first step to the last step."

Bensalem's emergency responders are especially pleased with pre-connected Philips Smart Pads. Smart Pads can be used on adult or pediatric patients. This simplicity reduces the stress on the responder, according to Fred Harran, Director of Public Safety. "In the heat of the moment, especially with a juvenile arrest, there is less confusion with one set of pads," Harran says. "Anything simpler is better."



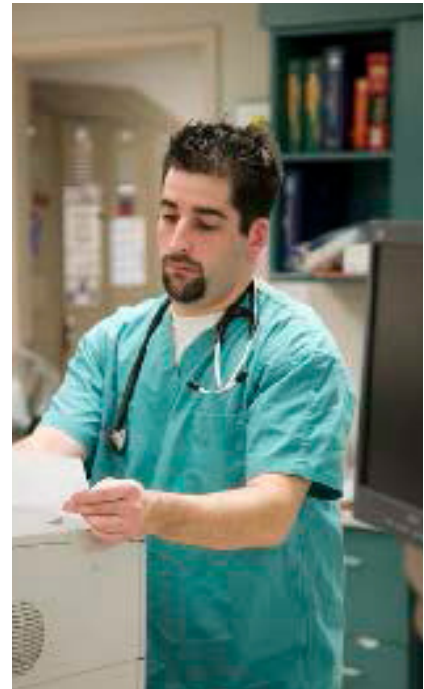
**"Philips is a good business partner. A good product for a good cause is an easy sell."**

**Fred Harran, Director of Public Safety**

# Decreasing time to treatment



Thomas Topley, Bensalem EMS Chief.



Transmitting a patient's ECG on the way to the ED can speed treatment.

Bensalem EMS is committed to improving the chances of survival for victims of SCA. In addition to placing AEDs where trained responders can use them, EMS is using Philips technology to get patients treated faster. Once a victim of SCA has been defibrillated and normal heart rhythm has returned, the underlying cause of the arrest still has to be treated at a hospital. If the patient is suffering from acute myocardial infarction, their ultimate destination may be the cath lab.

Bensalem EMS, with the help of Philips MRx monitor/defibrillator, is working to reduce the time

it takes to reach the cath lab. With the Philips MRx in the ambulance, paramedics can perform a diagnostic 12-lead electrocardiogram (ECG) on a patient and transmit it to the emergency department ahead of them. The ECG allows clinicians at the hospital to begin to assess the condition of the patient's heart and make a plan for when the patient arrives. For example, clinicians at the hospital can scramble a cath lab team, or prepare thrombolytic therapy. Since the MRx allows a hospital to begin organizing its resources before a patient even arrives, it can help dramatically reduce treatment delays.

The American College of Cardiologists recommends that no more than 90 minutes pass between ED arrival and angioplasty (door to balloon). With the MRx on board their ambulances, Bensalem has a goal of 45 minutes between EMS dispatch and the patient's arrival in the cath lab.

Having the technology to monitor 12-lead ECGs and send them ahead of the ambulance allows medics to "proactively effect advanced patient care," says Chief Topley.

# A community effort

Bensalem's SCA response program has been made possible by funding from a number of sources. Local physician and Rotarian Dr. Joel Kravitz spoke to his Rotary Club about the function of AEDs and their importance at the start of the COPE program. "The term 'AED' had no meaning when I spoke to them," says Dr. Kravitz, a specialist in occupational medicine.

"What if the police could be there in five minutes?" Dr. Kravitz recalls saying. "It could mean the difference between life and death." So the Rotary Club focused on providing the town's police officers with AEDs and training.

Additional funding came from the Bensalem Chamber of Commerce, the Fireman's Relief Association, and the Commonwealth of Pennsylvania. State Representative Gene DiGirolamo has been a committed supporter of the program whose fundraising has helped bring AEDs to Bensalem's athletic fields and associations.

Mayor Joseph DiGirolamo's support has also been critical to encouraging donations and getting AEDs placed throughout the community. For example, Bensalem Township installed an AED at the Commerce

Bank Amphitheater, a popular venue for large events. The budgets of the Bensalem school system, Police Department, Fire Department, and EMS have purchased further AEDs. Private businesses like Philadelphia Park

Casino and Racetrack, and other local employers have invested in AEDs, for which Bensalem EMS provides training and maintenance. And Bensalem's investment in AEDs has paid off in lives saved.



Mayor Joseph DiGirolamo.



Dr. Joel Kravitz.



Members of the Nottingham Fire Company.

# Saving lives



"If you have the equipment, the potential is there to save a life," says Sgt. Mike Marren of the Bensalem Police Department. Sgt. Marren knows this firsthand. At 10 am on November 4th, 2006, Sgt. Marren was having a conversation outside Philadelphia Park Racetrack when he received a call. Someone had suffered a cardiac arrest on the fifth floor.

The 73-year-old man exercised regularly, was in good shape, and had no prior cardiac problems. But on that morning his heart gave out, and he collapsed.

When Sgt. Marren arrived on the scene two and a half minutes later, an off-duty nurse was administering CPR. Sgt. Marren had brought the AED from his cruiser, and he applied the pads. The AED indicated that a shock should be given, so Sgt. Marren stopped CPR and gave the shock. The patient's breathing and pulse returned, though they were weak.

Bensalem EMS arrived five minutes later and transported the man to the nearest emergency department. On the way, the patient's heart resumed VF, and using the MRx in the ambulance, medics gave another shock.

"I spoke to the man's daughter," says Sgt. Marren, "and she said that he was conscious the next day in the ICU. His prognosis was a full recovery. There was no loss of oxygen to the brain." Sgt. Marren reports the man is now doing very well.

In 2002, Deputy Chief Robert Sponheimer of the Nottingham Fire Company and his family were cleaning up after Christmas dinner when they received a call from next door. A neighbor had collapsed.

"It was a slushy, snowy night," recalls Sponheimer. "The gentleman had a prior medical history and a bad knee, so I expected he had fallen." But when Robert and his brother Fred, also a firefighter, arrived, they found that the man had collapsed after suffering SCA.

Sponheimer and his brother administered CPR and called the Fire Company. Nottingham Fire Company was the first fire company in Bensalem Township to adopt AEDs in the mid-1990s. Now, all of the Company's trucks are equipped with AEDs. When the fire truck arrived, Sponheimer was able to use the truck's AED to deliver a shock.

"By the time the ambulance squad arrived, about eight minutes later, the patient had a rhythm," Sponheimer says. Bensalem EMS intubated the patient and transported him to the emergency department. The man was released from the hospital several months later. "He's well to this day," says Deputy Chief Sponheimer.

Most recently, on March 26, 2007, a 17-year-old male student at Bensalem High School who had recently undergone surgery for a congenital heart defect collapsed in the middle of class. Police officer Valerie Ridge arrived within two minutes with her AED and shocked the patient. Once Bensalem EMS arrived on the scene, they connected the patient to their MRx monitor/defibrillator and delivered another shock, converting the patient to normal sinus rhythm.

On the way to the emergency department, paramedics in the ambulance used MRx's wireless capability to send the patient's ECG to the hospital, which allowed them to plan for the young man's arrival.

Eventually, the patient was transferred to Children's Hospital of Philadelphia. Bensalem EMS faxed information about the event stored by their AEDs to CHOP to help them assess the patient's condition.



## Bensalem: a model for change

These and other saves made possible by Bensalem's COPE program have proven the foresight of Chief Topley, Dr. Kravitz, Mayor DiGirolamo, Steven Moran, and the many people who helped get it started. The partnership between Bensalem's emergency services and the wider community has helped raise awareness and save lives. Bensalem's community effort to provide AEDs and training as widely as possible has succeeded in improving the chances of survival for victims of SCA in Bensalem Township, and serves as a model for communities everywhere. Public access defibrillator programs like Bensalem's have the potential to dramatically reduce the mortality rates for SCA across the country.

For more information on HeartStart defibrillators or program implementation, contact Philips Medical Systems at 1-800-453-6860 or your local Philips sales office.

### References

1. Aufderheide T, Hazinski MF, Nichol G, Steffens SS, Buroker A, McCune R, et al. Community lay rescuer automated external defibrillation programs. *Circulation*. 2006 Mar 7;113(9):1260-70.
2. Larsen MP, Eisenberg MS, Cummins RO, Hallstrom AP. Predicting survival from out-of-hospital cardiac arrest: a graphic model. *Ann Emerg Med*. 1993 Nov;22(11):1652-8.
3. Valenzuela TD, Roe DJ, Cretin S, Spaite DW, Larsen MP. Estimating effectiveness of cardiac arrest interventions: a logistic regression survival model. *Circulation*. 1997 Nov 18;96(10):3308-13.
4. Hallstrom AP, Ornato JP, Weisfeldt M, Travers A, Christenson J, McBurnie MA, et al. Public-access defibrillation and survival after out-of-hospital cardiac arrest. *N Engl J Med*. 2004 Aug 12;351(7):637-46.

Philips Medical Systems is part of  
Royal Philips Electronics

### On the web

[www.medical.philips.com](http://www.medical.philips.com)

### Via email

[medical@philips.com](mailto:medical@philips.com)

### By fax

+31 40 27 64 887

### By postal service

Philips Medical Systems  
3000 Minuteman Road  
Andover, MA 01810-1085

### Asia

Tel: +852 2821 5888

### Europe, Middle East, Africa

Tel: +49 7031 463 2254

### Latin America

Tel: +55 11 2125 0764

### North America

Tel: +1 800 229 6417

© 2007 Koninklijke Philips Electronics N.V.  
All rights are reserved.

Philips Medical Systems Nederland B.V. reserves the right to make changes in specifications and/or to discontinue any product at any time without notice or obligation and will not be liable for any consequences resulting from the use of this publication.

452296223961 \* MAY 2007