

## Philips HeartStart FR2+ and XL Defibrillators

### Clinical profile



# Tiered defibrillation response at Miriam Hospital and Atlanta VA

At The Miriam Hospital, Providence, RI and the Atlanta VA Medical Center, Atlanta, GA updated resuscitation response models have basic life support (BLS) and advanced cardiac life support (ACLS) teams depending on each other in new ways with meaningful results: faster times-to-first-shock for sudden cardiac arrest (SCA) patients, higher survival-to-discharge rates and reduced equipment costs.

#### **On the scene, all the time**

In both hospitals, Philips HeartStart automated external defibrillators (AEDs) or manual defibrillators with AED

functions are strategically placed and BLS personnel are trained to use them. This tactic empowers first responders and ACLS responders alike with technology that is both simple enough for a sixth grader to use,<sup>1</sup> yet sophisticated enough to let advanced care practitioners take control when they arrive on the scene.

# Improve survival and lower costs with AED's across your hospital

This wide AED deployment and training model contributes to rapid time-to-first-shock (clocked at two minutes or less at The Miriam), improved survival-to-discharge rates (a 250 percent improvement at the Atlanta VA), and reduced capital expenditures.

## Double duty: CPR and early defibrillation by first responders, a challenge to the status quo

Think of it as basic life support redefined. With the availability of small, sophisticated yet simple-to-use AEDs, the standard practice of BLS personnel calling a code, initiating cardiopulmonary resuscitation (CPR) and waiting for the ACLS team to arrive is being challenged. CPR may buy time, but studies consistently show that the sooner defibrillation begins, the better the chance for survival. Even as little as one-minute faster time-to-shock is associated with improved survival.<sup>2</sup>

That's why the American Heart Association (AHA), Veteran's Health Administration (VHA) and the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) are directing the healthcare community to change their resuscitation response models.



## AHA: run the numbers

In a November, 1999 edition of USA Today, physician MaryAnn Peberdy said, "We have to ask whether we'd rather have a cardiac arrest in an airport, a casino or a hospital." This question gains relevance every day, as out-of-hospital survival rates climb as high as 40 to 75 percent with lay responders using AEDs, while average in-hospital rates across all departments still hover at the 15 percent mark established 40 years ago. To close the gap, the American Heart Association (AHA) Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care state that "strategic deployment of AEDs...and [first responder training are required to achieve] the level of the out-of-hospital setting."

The AHA makes the following recommendations: "Healthcare providers with a duty to perform CPR should be trained, equipped and authorized to perform defibrillation." Class IIa ("good to very good evidence," a "standard of care") "The goal... should be to have first responders provide early defibrillation"... in all areas of the hospital and ambulatory care facilities... with "collapse-to-first-shock intervals of < 3 minutes..." Class I ("excellent" evidence, "always acceptable, proven safe, and definitely useful")

## Equal opportunity response

What industry groups, such as the AHA and VHA, envision for in-hospital first responders is what lay responders have in airports, casinos, stadiums and other places where AEDs hang as fire extinguishers do: the opportunity to use technology to expand defibrillation capability, and ultimately to save more lives. In doing so, BLS first responders give advanced care practitioners a better chance to respond to a viable patient.

However, this transition won't necessarily be easy. "There are two sides to the control issue and we dealt with both," explains Samuel Dudley, Jr., M.D., Ph.D., Chief of Cardiology for the Atlanta VA Medical Center."

The old ACLS model has been entrenched in the minds of healthcare professionals for 40 years. It's not easy to believe that you can entrust defibrillation to someone you used to only expect CPR from—or that a machine, no matter how sophisticated, can play such a vital role in a life or death situation."

"For our nursing and support staff, it was a big leap to make as well. There was trepidation about taking charge and using the defibrillator. With training and the features that make these AEDs very easy to use, we've seen a shift. Nurses are pleased to have the training, the equipment and the opportunity to save a life."

### Technology of choice, a new standard of care

The tiered defibrillation response is now a standard of care at The Miriam and the Atlanta VA, with each hospital creating its own model using different Philips HeartStart defibrillators.

At The Miriam, a private 247-bed, not-for-profit, acute care general hospital in Providence, Rhode Island, which serves as a major teaching affiliate of Brown Medical School, all patient care areas except critical care have been equipped with Philips HeartStart FR2+ AEDs.

### Philips HeartStart FR2+

This portable, lightweight AED requires minimal device training to use and automatically determines whether a shock is required with the same accuracy as a trained observer of heart rhythms. The FR2+ also has pediatric capability, a heart rhythm display and manual override capability for improved hand-off to ACLS responders.



The Atlanta VA Medical Center, also a teaching institution, provides inpatient and outpatient services for more than 444,000 veterans in its region, with 191 hospital beds and 100 nursing home care unit beds. It chose the HeartStart FR2+ for all outpatient areas and the HeartStart XL defibrillator/monitor with AED capabilities for inpatient settings.

### Philips HeartStart XL

In AED mode, the HeartStart XL provides the same unambiguous voice prompts and text messages as the HeartStart FR2+, guiding BLS responders while continuously monitoring and displaying the patient's ECG. When the ACLS team arrives, it's a quick switch to manual mode for access to advanced features such as selectable energy and non-invasive pacing.



### The Miriam Hospital

The pilot program that brought AEDs to The Miriam was in place more than a decade ago. The rationale was that every other attempt to improve time-to-first-defibrillation had fallen short. And the hospital had tried many things.

First, they expected that simply having a broad ACLS staff available 24 hours a day to cover the relatively small hospital would make an impact. Then they trained BLS nurses on manual defibrillators. They even redesigned the code team. All along, there were some efficiency gains, but no significant changes in the time it took to administer that first lifesaving shock.

Then they installed six AEDs and trained the nurses in two telemetry units to use them. "These were the same nurses we'd trained on the conventional defibrillators," explains Sandra Sawyer-Silva, nurse manager of the

intensive care unit and chairperson of the CPR review committee. "The difference was that they never felt comfortable using a conventional defibrillator, so the results didn't improve. With the AEDs, the nurses felt comfortable and empowered."

"The results were amazing," reports Sawyer-Silva. "From 1991-1995, The Miriam had a 60 percent survival-to-discharge rate on VT/VF patients on whom the AEDs were used. Clearly the speed of first-shock was the significant factor."

### **Atlanta VA Medical Center**

Within six months of its pilot program testing the value of BLS first responders using AEDs, the Atlanta VA Medical Center decided that fast access to simple-to-use defibrillators was the key to improving the hospital-wide four percent survival-to-discharge rate for SCA patients.

It was a decision that preceded the announcement of the Veteran's Health Administration AED Directive 2001, which calls for access to a defibrillator within one minute and first shock delivered within three to four minutes of the patient's collapse.

Today, the center's primary care clinics, dental office, nursing home and other outpatient areas are equipped with portable, lightweight AEDs. Every inpatient area has manual defibrillators with AED mode.

"The numbers speak for themselves," reports Dr. Dudley. "Our VF/VT survival-to-discharge rate is now 46 percent, a 600 percent improvement."

### **It adds up clinically and financially**

In addition to the clinical benefits, these two hospitals are also making financial gains through their tiered defibrillation response models. Because the cost of AEDs is considerably less than manual defibrillators, an organization that purchases a mix of models reduces total cost without compromising coverage. Cost savings

can prove to be highest when manual defibrillators are purchased only for ACLS-first response areas, such as critical care, with AEDs deployed elsewhere.

"Our motivation was better patient care," says The Miriam's Sawyer-Silva. "What we've also experienced are financial gains. Having recently replaced our aging AEDs with new, state-of-the-art biphasic models from Philips, we're able to maintain a high level of defibrillation coverage for considerably less cost to the institution. That's a win-win."

Agrees the VA's Dr. Dudley, "It didn't make sense to us—clinically or financially—to put complicated devices in areas where we fully expect the first responders to be BLS users. Just the appearance of complexity can make a potential user uncomfortable. With the availability of low-cost, high-quality AEDs, we were able to purchase more and, therefore, distribute defibrillation capability more widely."

Clearly, by opting for a tiered response model, both The Miriam Hospital and the Atlanta VA Medical Center have reaped benefits both clinical and financial. All it took was a clear vision and some careful planning and deployment to provide maximum coverage per dollars spent.



"Today, with 22 AEDs distributed across all non-critical areas of the hospital, we've improved time-to-first-defibrillation from seven to ten minutes to two minutes or less."

Sandra Sawyer-Silva, MSN, RN, CCRN  
The Miriam Hospital



"Our VF/VT survival-to-discharge rate is now 46 percent, a 600 percent improvement."

Samuel Dudley, Jr., M.D., Ph.D.  
Atlanta VA Medical Center



For more information on the HeartStart XL and FR2+ defibrillators, contact Philips Medical Systems at your local Philips sales office or Philips Regional Office.

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## References

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