PHILIPS

HeartStart AEDs

Why Philips AEDs?

Because the therapy is proven

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published studies prove effectiveness of Philips AED therapy.

A shock from a defibrillator within three to five minutes of a sudden cardiac arrest (SCA) is widely recognized as the most reliable way to restore the heart's normal rhythm.[1] But which AED is the right choice for effective therapy?

The efficacy of Philips AED technology is supported by over 40 published peer-reviewed studies. Two of those studies showed 100% first shock efficacy.[2,3] Another demonstrated 96%.[4] No other AED manufacturer can claim superiority to Philips therapy. Our evidence was sufficiently compelling to make Philips technology the first Biphasic therapy to be recommended by the American Heart Association for a Class 3 designation, meaning "standard of care" and "intervention of choice".[4]

Discover how the Philips AED with SMART Biphasic technology can help you deliver effective therapy when responding to sudden cardiac arrest.

When every minute counts, Philips AED Solutions are **a partner by your side.**

Philips Healthcare pioneered biphasic AED therapy, the technology that is now the gold standard. But not all biphasic therapy is created equal. In fact, every manufacturer uses its own proprietary biphasic waveform.

So why is the Philips AED with SMART Biphasic therapy the right choice?

Fast. In the event of SCA, time is the enemy. With a Philips AED, your patient receives its highest peak current on the very first shock, as well as on every subsequent shock. Other AEDs hold back, escalating to higher levels only if necessary. Given this timing sequence with some other AEDs, patients may not get the therapy they need for as long as six minutes. And, with our proprietary Quick Shock technology, Philips AEDs are among the fastest in delivering shock treatment after CPR. Reducing time to shock after chest compressions by even a few seconds can improve shock success.[5]

Efficient. Current is the true measure of shock intensity.[5] Thanks to the unique Philips capacitor technology, Philips 150-joule shocks pack more peak current joule-for-joule than conventional higher-energy waveforms from other manufacturers.

Flexible. Philips AED with SMART Biphasic technology is proven to work for a wide range of patients. This includes children and infants, as well as those some claim are difficult to defibrillate – large, obese patients, those with high or low body resistance, people with recurring VF episodes, and those with a myocardial infarction.[6-9]

Effective. High energy and elevated joules do not necessarily lead to stronger shock or better outcomes. In fact, high energy may stun an already fragile heart.[10] Philips AED with SMART Biphasic therapy combines high current for effectiveness and low energy to reduce the risk of stunning a vulnerable heart.

Automated. Philips AED with SMART Analysis automatically assesses heart rhythm to determine if a shock is needed. This automated feature persists regardless of whether the shock button is pressed. Philips AEDs will adjust the shock intensity instantly based on the patient's body resistance, so escalating energy is not necessary.

Therapy you can count on. Philips HeartStart HS1 and HeartStart FRx AED both incorporate our SMART Analysis heart rhythm assessment and SMART Biphasic technology. You can learn more about our advanced defibrillation technology at **www.philips.com/healthcare**.

Philips—the first choice

The experts agree Philips AEDs with SMART Biphasic technology have received scores of awards from independent organizations and respected publications. Among these recognitions are an outstanding published review by ECRI, an objective, non-profit evaluator of medical equipment, and a favorable owner survey by the British Department of Health.

Rewards and recognition include:

- MD Buyline Highest Rating
- Best of What's New 2003, Popular Science
- Most Loved Products of 2004, Amazon.com
- Readers' Choice Award 2004, Today's Facility Manager
- Medical Design Excellence Award, 1997, 2003
- Best Products of 2004, Fortune
- Forbes Ten Years/Ten Disruptors
- External Defibrillator Business Development Strategy, Leadership of the Year 2005, Frost & Sullivan
- EMS Today 2012 Hot Products

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Emergency Care and Resuscitation

This research summary brought to you by Philips

Effects of AED Device Features on Performance by Untrained Laypersons

Mosesso Jr, V.N. et al. *Resuscitation* 2009.07.016

Device features associated with increased performance rate were not always associated with shorter times to shock. This may reflect benefit of more detailed instructions for untrained users.

Objective

The study evaluates the impact of features of automated external defibrillators (AEDs) on the performance and speed of untrained laypersons to deliver a shock and initiate CPR after a shock. It assesses how these features affect the ease and speed with which a layperson performs a simulated cardiac arrest rescue.

Methodology

A prospective, randomized observational evaluation of six different AED models in a simulated cardiac arrest using trainer AEDs on manikins. Models include Cardiac Science PowerHeart AED G3, Heartsine Samaratan PAD, Medtronic CR Plus, Philips HeartStart Onsite, Welch Allyn AED 10 and ZOLL AED Pro. Subjects had no previous AED or advanced medical training.

Subject performance of individual steps by device model.

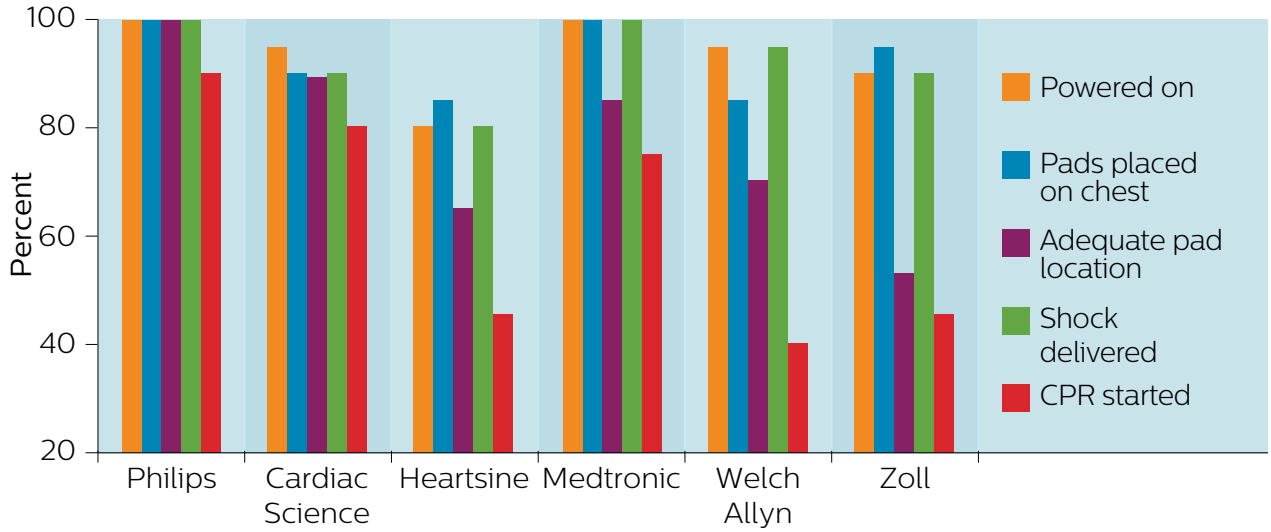

Figure 1: Many cardiac arrest victims who now die can be saved with prompt defibrillation.[1] Note that Philips led in observed performance in all categories. Note also the wide variability in pad placement accuracy and starting CPR. Based on table 3 of the manuscript.

Though subjects were instructed to attempt to use a device to "rescue" a manakin simulating a Sudden Cardiac Arrest (SCA) victim, they were not provided with instructions on how to use the device. Each subject used only one device. There were twenty subjects per device.

A scenario was stopped when the subject started performing CPR, or 5 minutes had elapsed, or the subject expressed a desire to stop. The subject then completed a questionnaire about device operation, ability to locate and place pads, and voice, text and graphic prompts.

Primary endpoints were shock delivery and elapsed time from start of scenario to shock. Secondary endpoints included time to power-on, time from second rhythm analysis to initiation of CPR, adequacy of pad placement and subject survey responses.

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Results

- Philips led all devices in observed device operation success (Figure 1)
  - Only Philips users demonstrated 100% success in turning the device on, attaching the pads on the chest, placing them accurately, and delivering a shock
  - Only Philips achieved a 90% success rate in starting CPR
- Devices that do not provide detailed CPR instructions (Heartsine, Welch Allyn, and Zoll) had lower success rates at starting CPR. Approximately half the responders using those devices did not perform that critical step (26/51)
- Cardiac Science and Zoll subjects were significantly slower to deliver a shock
- Device features associated with rescue success were not always associated with faster time-to-shock. This may be indicative of the benefits of more detailed instructions for untrained users

Conclusion

In a simulated cardiac arrest, most untrained users can successfully deliver a shock within three minutes, however pad placement is often inadequate, and CPR is often not started. Device ergonomic features have the greatest impact on three actions: powering on device, proper pad placement, and starting CPR after shock.

Philips Commentary

These results are consistent with those of three other AED ease-of-use studies,[2,3,4] in which the Philips device also led in observed mission success. These studies demonstrate Philips ease of use compared to other manufacturers.

The authors point out that inexperienced lay-responders benefit from device features that better ensure that rescuers actually perform steps critical to survival. Philips detailed instructions, paced to the responder's speed, are helpful in ensuring consistent and correct execution of the rescue. This is important for stressed, inexperienced responders because a shock not delivered or CPR not performed seriously compromises survival. And pads placed inaccurately compromises the effectiveness of the shock.[5]

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PHILIPS

Automated External Defibrillator

HeartStart AEDs

The Philips Difference

HeartStart AEDs are ready to go – on wet or metal surfaces.

Be ready for the real world

You never know when or where sudden cardiac arrest will strike. It could happen in the driving rain, sleet, or snow. At poolside, a marina, an ice rink, or the health club shower. The victim might be lying on a highly conductive metal surface like a loading dock, freight elevator, storefront grid, or grated walkway.

No matter where SCA takes place, you're ready and able to help save a life – with Philips HeartStart AEDs.

One of a kind

All AEDs should be safe to use anywhere, at any time. But that's simply not the case. Many manufacturers sell AEDs with specific warnings to move patients from wet or metal surfaces before using. Or to avoid rain and extreme moisture.

Philips AEDs are a breed apart because they're proven in real-life environments. Studies show that shocking a patient with a HeartStart AED on wet concrete poses a particularly low risk.[1] And treating SCA victims lying on metal surfaces is just as safe with our family of AEDs.

No rain delays

When every second counts, delaying treatment to move a patient off a wet or metal surface can be a matter of life or death. More than half the victims of the most common cause of SCA can survive when treated with CPR and shock from a defibrillator within 3 to 5 minutes of collapse.[2] So you can't afford to wait.

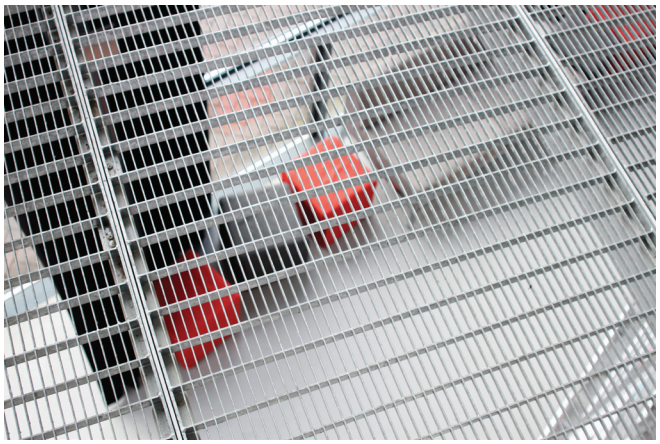
Be sure

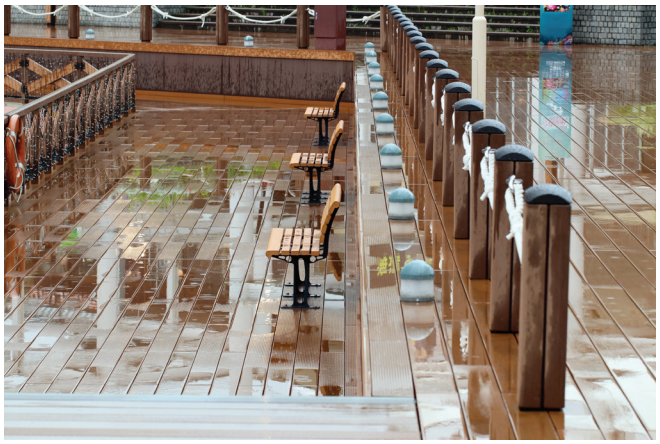
Count on Philips HeartStart AEDs to help you deliver the right therapy quickly and confidently – even on wet and metal surfaces.

The HeartStart AED family

Where can you use Philips HeartStart AEDs? Everywhere SCA happens.





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PHILIPS

Automated
External Defibrillator

HeartStart HS1

Side by side. Step by step.

Philips HeartStart HS1 AED

To save a life

Most people have never been in a position to administer an AED. When the moment arrives, it is easy to panic. A calm voice walking you through the process step by step means you are never alone. With Philips AED Solutions, you can have an expert by your side.

It is crucial that AEDs be close at hand, ready to go, designed to be easy to use, lightweight and rugged.

Cardiovascular disease is a leading cause of global mortality, accounting for almost 17 million deaths annually, or 30% of all global mortality.[1]

1. Mehra, R. (2007). Global public health problem of sudden cardiac death. Journal of Electrocardiology, 40(6 Suppl), S118-122.doi:10.1016/j.jelectrocard.2007.06.023

The Philips HeartStart HS1 assists you through the process of treating a victim of suspected sudden cardiac arrest (SCA). The HS1 AED provides practically real-time guidance through step-by-step voice commands and CPR guidance.

- Includes features to help guide the treatment of sudden cardiac arrest with easy setup, clear voice commands and real time metronome
- Arrives virtually ready to use. With the Ready-Pack configuration, the HS1 AED is positioned inside the carry case with Adult SMART Pads Cartridge and battery already installed and with a spare Adult SMART pads cartridge in place
- Guides you through a cardiac emergency with a simple, step-by-step process, adaptive instructions and intelligent sensors to help deliver therapy
- Use on infants and children under 25 kg or 55 lbs or 0-8 years old, and adults and children over 25 kg or 55 lbs or greater than 8 years old
- Senses when the special Infant/Child SMART Pads cartridge is installed, and automatically adjusts CPR instructions and shock energy
- Can be converted to a trainer with installation of training pads cartridge
- Conducts a series of automatic self-tests daily, weekly and monthly, to check pad readiness and verify functionality and calibration of circuits and systems

Advanced technology. Proven therapy.

Patented Quick Shock feature allows the HS1 to typically deliver a shock within 8 seconds after CPR.[2]

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Ready to act. Ready to go.

Designed for the ordinary person in the extraordinary moment, Philips HeartStart HS1 AED is ready to act and virtually ready to go. It allows anyone with little or no training to treat the most common cause of sudden cardiac arrest (SCA) by delivering a shock quickly and effectively, wherever SCA happens.

Start quickly. Treat confidently.

With access to the right equipment and support, you can help save a life. The HS1 AED guides you through the process of treating a victim of suspected sudden cardiac arrest. The HS1 AED provides practically real-time guidance through step-by-step voice commands and CPR guidance.

Easy as 1-2-3

We've equipped HS1 with integrated SMART Pads that will provide feedback to the AED so it can adapt its voice instructions to your actions and your pace. The system won't announce the next step until you are ready. Prompts are repeated and rephrased if needed and include additional instruction to aid understanding.

Answers for your questions

Sudden Cardiac Arrest

Q: What causes SCA?
A: SCA occurs when the electrical system of the heart becomes chaotic, causing it to stop beating effectively. Lacking proper blood flow, the person becomes unresponsive and stops breathing normally. CPR is important, but it alone cannot restore a normal heart rhythm.[3,4] A shock from a defibrillator is the most effective way to restore the heart's normal pumping rhythm.[6]

Technique

Q: What if I don't know the proper technique?
A: HS1 acts as your personal coach to guide you through the process of treating a victim of suspected sudden cardiac arrest. HS1 provides practically real-time guidance with real-time step-by-step voice instructions.

Q: How soon must the defibrillator shock be administered?
A: The person's best chance of survival is to receive that shock within 3-5 minutes of collapse.[7,8] A defibrillator will not save every person who experiences SCA, but more lives could be saved if those affected were reached more quickly.[7-9] Your quick response makes a real difference.

Q: How do I know if a shock is needed?
A: The defibrillator assesses the patient's heart rhythm. If a shock is advised, it directs you to press the flashing orange Shock button.

Q: What if I don't know where to put the pads?
A: The SMART Pads cartridge contains two adhesive pads that have pictures on them to show you where to place the pads on the person's bare skin, and voice instructions will remind you to look at the pictures. The pads are "smart" because they sense when they have been removed from the cartridge, peeled from their liners, and applied to the patient, causing the voice instruction to adjust to your actions.

Q: What do I tell the professionals when they arrive?
A: They will know what questions to ask you. If an Emergency Medical Services (EMS) responder needs a summary of care, it can be retrieved from the defibrillator's internal memory. The EMS provider simply presses the i-button, and HS1 will verbally recount events from its last clinical use.

Technology

Q: How does HS1 assess heart rhythm?
A: HS1 includes proven Philips technology for heart rhythm assessment, called SMART Analysis. SMART Analysis is a sophisticated algorithm that simultaneously evaluates several attributes of a person's heart rhythm to determine if the rhythm is shockable.

Q: How does HS1 know how much energy to deliver?
A: A technology called SMART Biphasic Impedance Compensation helps HS1 deliver the optimal amount of current and energy. Smart Biphasic is the first biphasic therapy with sufficient evidence to be classed "standard of care" and "intervention of choice" by the American Heart Association.[4-9] SMART Analysis and SMART Biphasic's effectiveness are backed by over 40 published, peer-reviewed studies.[10]

Training

Q: Is training available?
A: Yes. A special training SMART Pads cartridge can be installed in the defibrillator. It disables the defibrillator's ability to shock, while walking you through patient care scenarios. We also offer easily accessible, online training that discusses everything from setting up an AED program to replacing your defibrillator's battery.

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HeartStart HS1 AED specifications

Defibrillator

Defibrillator family	HS1. Order M5066A
Standard configuration	Defibrillator, battery, adult SMART Pads cartridge (1 set), Setup and Maintenance Guides, Owner's Manual, Quick Reference Guide, date sticker
HeartStart HS1 Ready-Pack configuration	Order option R01. Defibrillator, battery, carry case, adult SMART Pads (1 pre-installed set, 1 spare set), Setup and Maintenance Guides, Owner's Manual, Quick Reference Guide, date sticker
Waveform	Truncated Exponential Biphasic; waveform parameters adjusted as a function of each patient's impedance
Therapy	Adult defibrillation: peak current 32 A (150 J nominal into a 50-ohm load) Pediatric defibrillation with optional Infant/Child SMART Pads cartridge installed: peak current 19 A (50 J nominal into 50-ohm load)
Shock-to-shock cycle time	Typically less than 20 seconds between shocks in a series
Quick Shock	Able to deliver a shock after the end of a CPR interval, typically in 8 seconds
Voice instructions	Detailed voice messages guides the responder through use of the defibrillator
CPR guidance	Instructions for infants and children under 25 kg or 55 lbs. or 0-8 years old, and adults and children over 25 kg or 55 lbs or greater than 8 years old
Shock delivery	Via adhesive pads placed on patient's bare skin as illustrated on pads
Controls	Green SMART Pads cartridge handle, green On/Off button, blue i-button, orange Shock button
Indicators	Ready light; blue i-button; caution light, Shock button lights up when shock is advised

Physical

Size	7.2 cm H x 19 cm D x 21 cm W (2.8″ H x 7.4″ D x 8.3″ W)
Weight	With battery and pads cartridge: 1.5 kg (3.3 lbs.) Without battery or pads cartridge: 1 kg (2.4 lbs.)

Environmental/physical requirements

Sealing	Solid objects per EN60529 class IPX2 Drip-proof per EN60529 class IPX1
Temperature	Operating: 0° – 50° C (32° – 122° F) Standby: 10° – 43° C (50° – 109° F)
Humidity	Operating: 0% to 95% relative, non-condensing Standby: 10% to 75% relative, non-condensing
Altitude	Operating: 0 to 4,572 m (15,000 feet) Standby: up to 2,591 m (8,500 feet)
Shock/drop abuse	Withstands one-meter drop to any edge, corner or surface
Vibration	Meets EN1789 random and swept sine, road ambulance specification in operating and standby states
EMI (radiated/immunity)	Meets EN55011 Group 1 Level B Class B and EN61000-4-3

Data recording and transmission

Infrared	Wireless transmission of event data to a Smartphone or PC, using the IrDA protocol
Data stored	First 15 minutes of ECG and the entire incident's events and analysis decisions

Patient analysis system

Patient analysis	Evaluates patient ECG to determine if a rhythm is shockable. Rhythms considered shockable are ventricular fibrillation (VF) and certain ventricular tachycardias (VT) associated with lack of circulation. For safety reasons, some VT rhythms associated with circulation will not be interpreted as shockable, and some very low-amplitude or low-frequency rhythms will not be interpreted as shockable VF.
Sensitivity/specificity	Meets AAMI DF80 guidelines and AHA recommendations for adult defibrillation (Circulation 1997;95:1677-1682)
Artifact detection	The effects of pacemaker artifact and electrical noise are minimized

Battery (M5070A)

Type	9 Volt DC, 4.2 Ah, composed of disposable long-life lithium manganese dioxide primary cells
Capacity	Minimum 200 shocks or 4 hours of operating time
Install-by date	Battery is labeled with an install-by date of at least 5 years from date of manufacture
Standby life	Typically, 4 years when battery is installed and when stored and maintained according to directions provided in this document

SMART Pads

Adult SMART Pads cartridge	M5071A defibrillation pads for patients over 8 years of age or 25 kg (55 lbs.) and over
Infant/Child SMART Pads cartridge	M5072A defibrillation pads for patients 0-8 years of age and under 25 kg (55 lbs) by prescription only
Active surface area	85 cm^2 (13.2″^{2}) each
Cable length	Adult SMART Pads: 137.1 cm (54″) Infant/Child SMART Pads: 101.6 cm (40″)
Use-by date	Cartridge is labeled with a use-by date of at least 2 years from date of manufacture

Training SMART Pads

M5073A	Adult Training SMART Pads cartridge
M5074A	Infant/Child Training SMART Pads cartridge
Function	Training SMART Pads cartridges feature 8 real-world training scripts; used with training mat (included) or with adapters on manikins

Automated and user-activated self-tests

Daily automatic self-tests	Tests internal circuitry, waveform delivery system, pads cartridge, and battery capacity
Pads integrity test	Specifically tests readiness-for-use of pads (gel moisture)
Battery insertion test	Upon battery insertion, extensive automatic self-tests and user-interactive test check device readiness
Status Indicators	Blinking green "Ready" light indicates ready for use; audible "chirp" indicates need for maintenance

* Refer to the HeartStart HS1 Defibrillator Owner's Manual for detailed product instructions. All specifications based on 25° C unless otherwise noted. The defibrillator and its accessories are made of latex-free materials.

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