PHILIPS

Automated
External Defibrillator

HeartStart HS1

Side by side. Step by step.

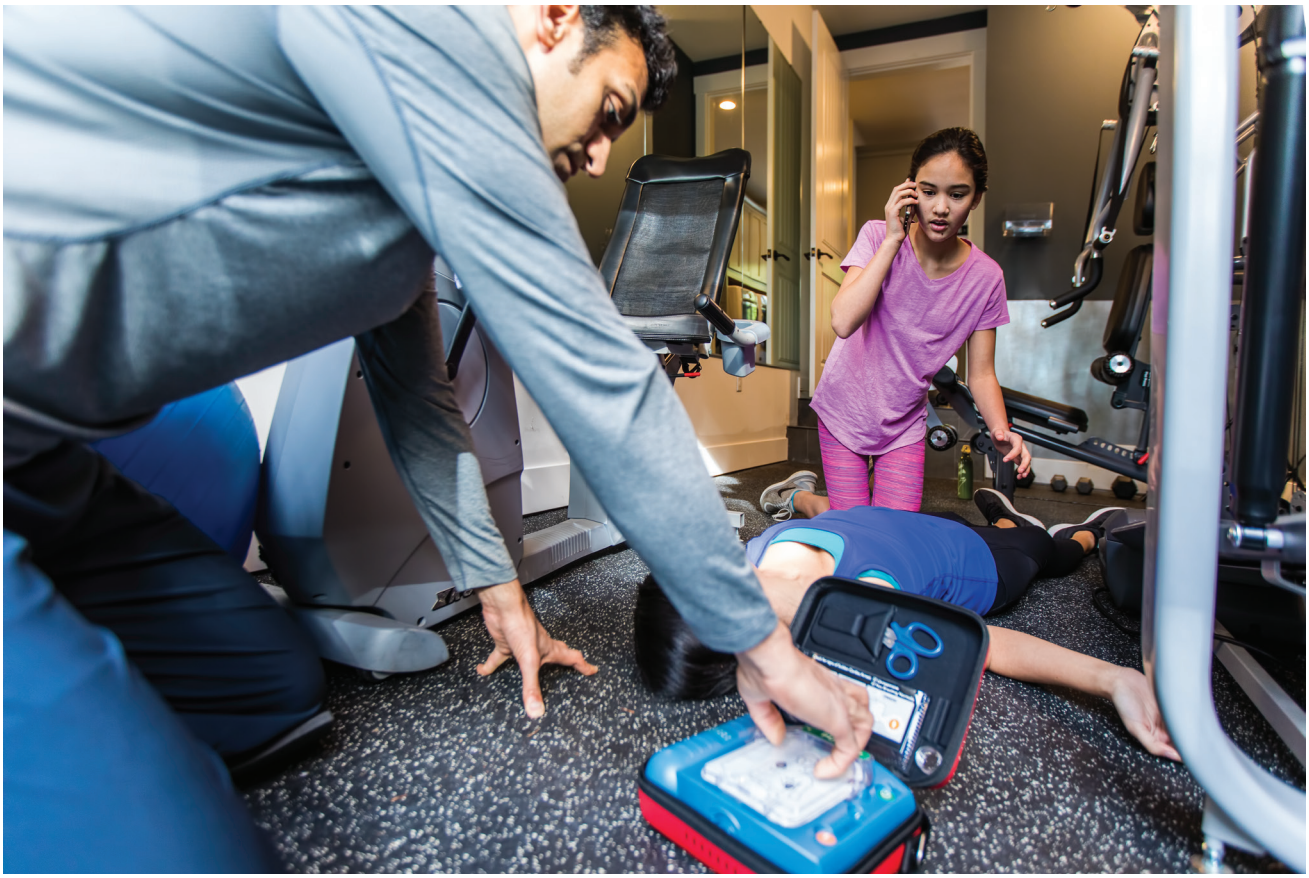
Philips HeartStart HS1 AED

To save a life

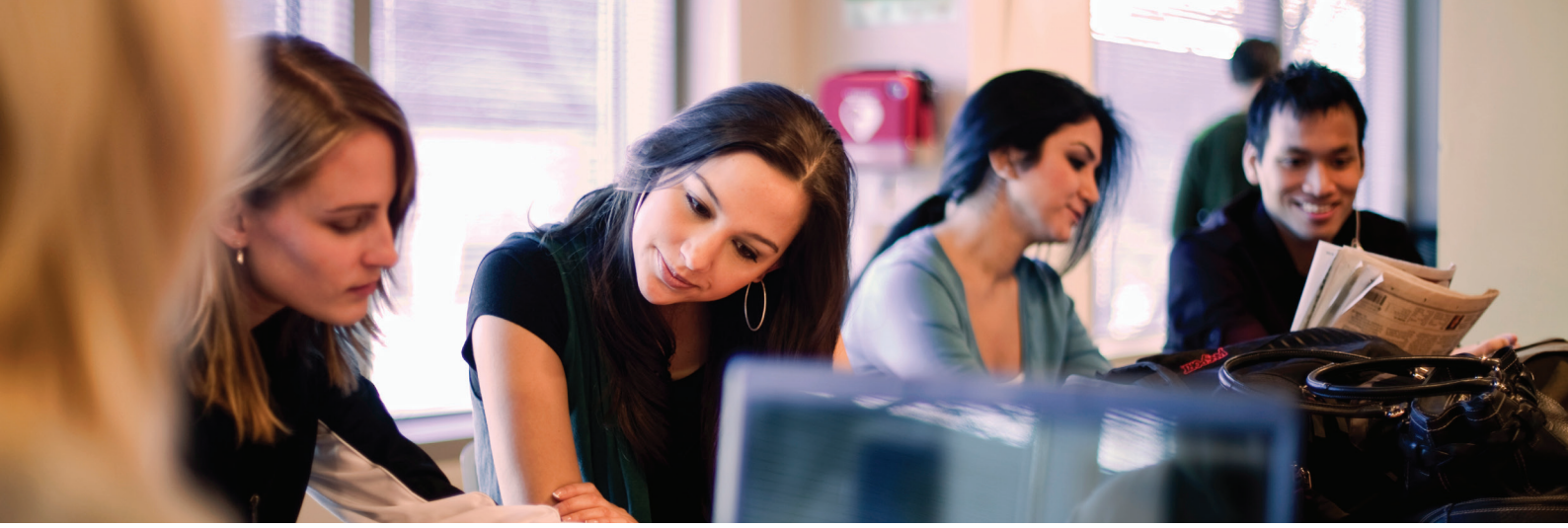
Most people have never been in a position to administer an AED. When the moment arrives, it is easy to panic. A calm voice walking you through the process step by step means you are never alone. With Philips AED Solutions, you can have an expert by your side.

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]



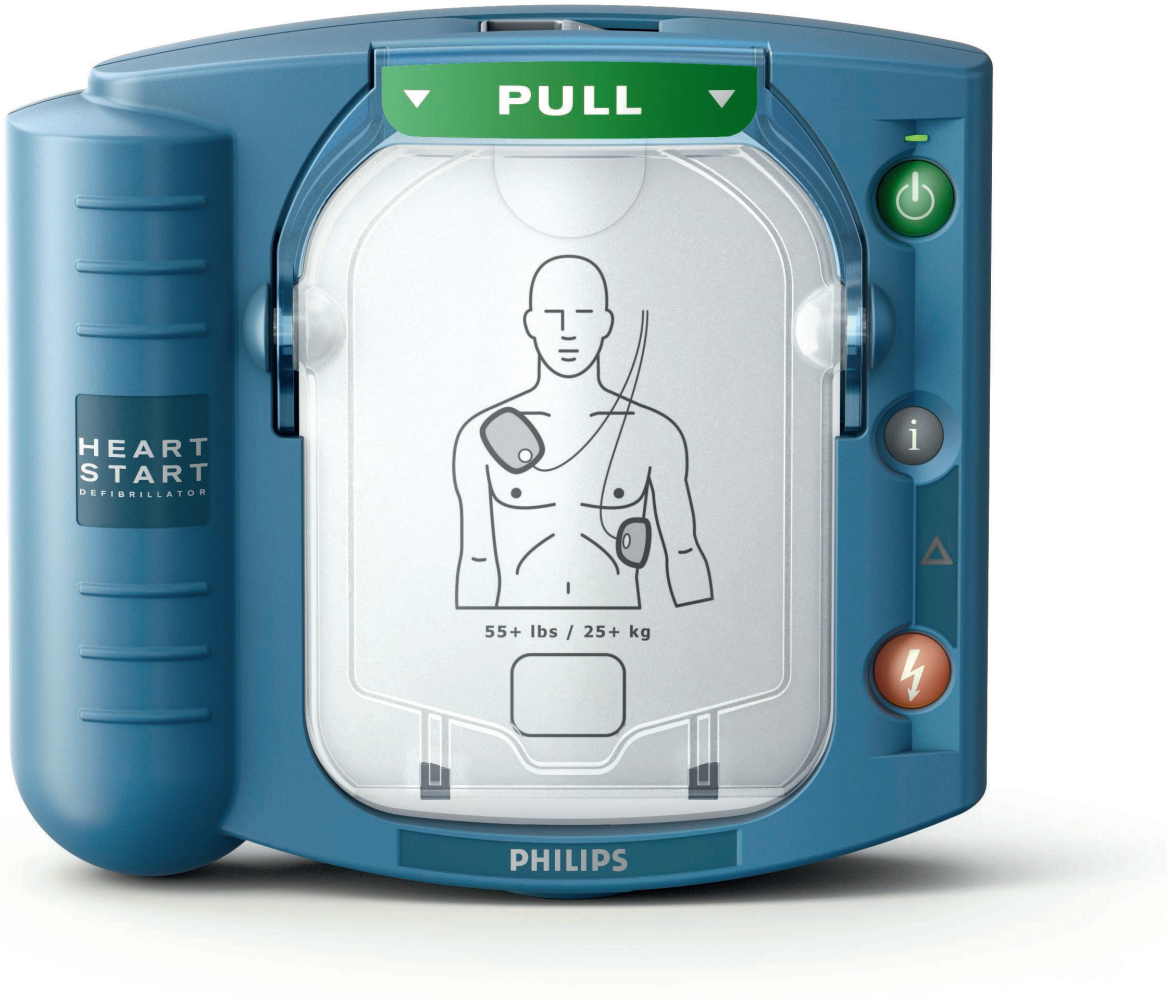
1. Mehra, R. (2007). Global public health problem of sudden cardiac death. Journal of Electrocardiology, 40(6 Suppl), S118-122.doi:10.1016/j.jelectrocard.2007.06.023



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.

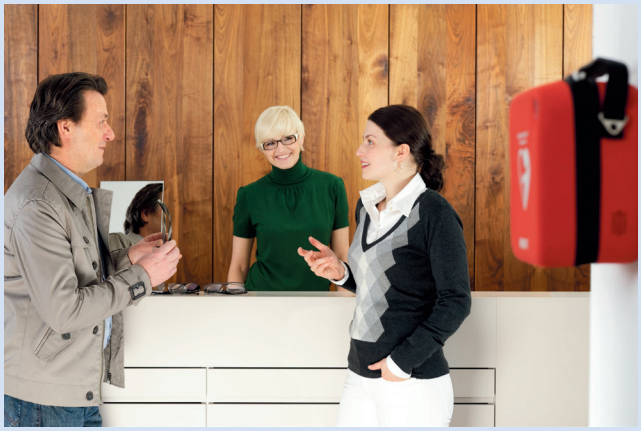
- Includes features to help guide the treatment of sudden cardiac arrest with easy setup, clear voice commands and real time metronome
- Arrives virtually ready to use. With the Ready-Pack configuration, the HS1 AED is positioned inside the carry case with Adult SMART Pads Cartridge and battery already 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]

2. Nichol, G., Sayre, M. R., Guerra, F., & Poole, J. (2017). Defibrillation for Ventricular Fibrillation: A Shocking Update., 70(12), 1496-1509. doi:10.1016/j. jacc.2017.07.778. *Journal American College of Cardiology* doi:10.1016/j. jacc.2017.07.778

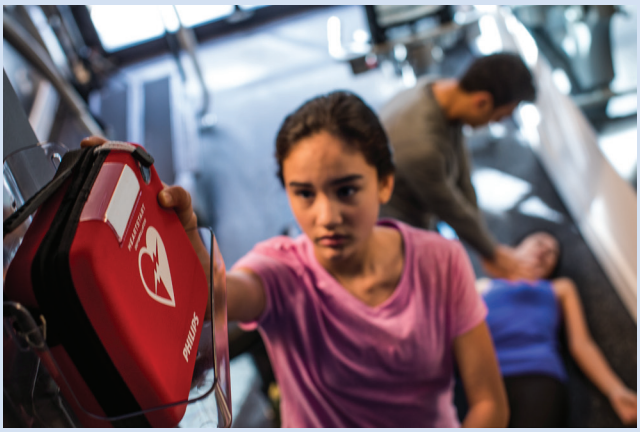


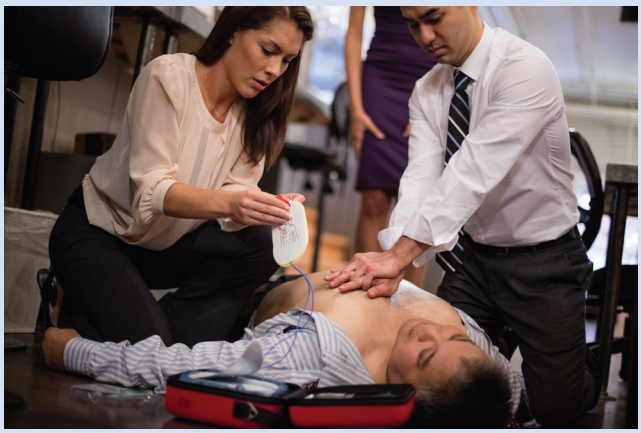
Ready to act. Ready to go.

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.

3. Kleinman, M. E., Brennan, E. E., Goldberger, Z. D., Swor, R. A., Terry, M., Bobrow, B. J., . . . Rea, T. (2015). Part 5: Adult basic life support and cardiopulmonary resuscitation quality: 2015 american heart association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*, 132(18 suppl 2), S414-S435.

4. Link, M. S., Atkins, D. L., Passman, R. S., Halperin, H. R., Samson, R.A., White, R. D., . . . Kerber, R. E. (2010). Part 6: Electrical therapies: Automated external defibrillators, defibrillation, cardioversion, and pacing: 2010 american heart association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*, 122(18 Suppl 3), S706-719. doi:10.1161/CIRCULATIONAHA.110.970954.

5. Aschieri, D., Penela, D., Pelizzoni, V., Guerra, F., Vermi, A. C., Rossi, L., . . . Capucci, A. (2018). Outcomes after sudden cardiac arrest in sports centres with and without on-site external defibrillators. Heart. doi:10.1136/heartjnl-2017-312441.

6. Patil, K. D., Halperin, H. R., & Becker, L. B. (2015). Cardiac arrest resuscitation and reperfusion. *Circulation Research*, 116(12), 2041-2049. doi:10.1161/circresaha.116.304495.

7. Scott, T. (2017). Use of automated external defibrillators saves lives. *Emergency Nurse*, 25(3), 5-5.

8. Myat, A., Song, K.-J., & Rea, T. (2018). Out-of-hospital cardiac arrest: Current concepts. The Lancet, 391(10124), 970-979. doi:https://doi.org/10.1016/S0140-6736(18)30472-0.

9. Guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care. Part 4: The automated external defibrillator: Key link in the chain of survival. The american heart association in collaboration with the international liaison committee on resuscitation. (2000). *Circulation*, 102(8 Suppl), I60-76.

10. Philips Medical Systems. (2009). Philips smart biphasic therapy. Retrieved from https://www.usa.philips.com/healthcare/product/HC861304/heartstart-frx-automated-externaldefibrillator

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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