



# CPR Advisor

## Why CPR Feedback is Important

The importance of good quality CPR during sudden cardiac arrest (SCA) can hardly be argued.

However, minimally-trained and lay responders often have difficulty in performing good quality CPR. In fact, even some semi-professional rescuers are often challenged to get the quality right for each victim.

The collective wisdom is summarized by the AHA in the following:

*“The quality of unprompted CPR in both in-hospital and out-of-hospital cardiac arrest events is often poor, and methods should be developed to improve the quality of CPR delivered to victims of cardiac arrest.”*

and by the ERC by the following:

*“In order to maintain high-quality CPR, feedback to rescuers is important. The use of prompt/feedback devices during CPR will enable immediate feedback to rescuers, and the data stored in rescue equipment can be used to monitor the quality of CPR performance and provide feedback to professional rescuers during debriefing sessions.”<sup>2</sup>*

## CPR Advisor

With two standard defib electrodes, HeartSine Technologies’ patented impedance cardiography (ICG) analysis technology is able to provide feedback on the quality and rate of compressions during CPR.<sup>3</sup>

## What is ICG?

ICG is a real-time chart of the small scale changes in patient impedance. There are many factors that affect patient impedance, including body mass, skin condition, and respiration phase.

Among the factors that affect the ICG is the presence (or lack) of blood in blood vessels in the chest cavity.

This information can be filtered and processed to give an indication of the extent of the blood pulsing in the chest cavity and therefore the effectiveness of the CPR compressions.<sup>4, 5, 6, 7</sup> The rate of the compressions can also be determined by counting the peaks in the waveform.

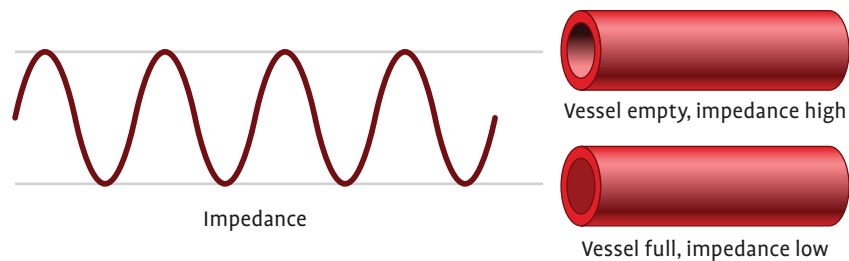
HeartSine uses this technology to provide clear and direct feedback on the effectiveness of CPR.

## HeartSine Comparison

The HeartSine CPR Advisor is unique. It is also fundamentally different to the alternative devices available that use accelerometer technology which only measures the depth of compressions.

These alternative devices will give positive feedback if sufficient force is being applied to a transducer placed on the chest. And they take no consideration for differences in patient size and shape or CPR on soft or moving surfaces (beds, boats, etc.).

Only HeartSine’s CPR Advisor is based on how much output the compressions are actually achieving.



As vessels fill and empty, the impedance changes.

The accuracy (sensitivity) of the HeartSine CPR Advisor is greater than 95%<sup>3</sup>. The accuracy of accelerometer based devices is only 53%<sup>8</sup>.

### HeartSine Technology Advantage

Innovation in technology drives HeartSine in the design, development and manufacture of Automated External Defibrillators (AED).

The company's pedigree dates back over 50 years to the development of the world's first out-of-hospital defibrillator in the 1960s. Since then HeartSine technologists have been at the forefront of placing life-saving technology in the hands of users of all skill levels.

At HeartSine our technology changes lives. And saves lives.

**It's Lifesaving, Pure and Simple.**

### References

1. 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Part 5: Adult Basic Life Support
2. European Resuscitation Council Guidelines for Resuscitation 2010. Section 2. Adult basic life support and use of automated external defibrillators
3. The Impedance Cardiogram is an indicator of CPR effectiveness for out-of-hospital cardiac arrest victims  
Rebecca C. Di Maio, Cesar Navarro, Nicholas Cromie, John McC Anderson, Jennifer AJ Adgey J Am Coll Cardio, Vol 55, Issue 10, Supp 1, Page A217
4. Impedance Cardiography as a non invasive method of monitoring cardiac function and other parameters of the cardiovascular system. W. G. Kubicek, R. P. Patterson, D. A. Witsoe. Annals of the New York Academy of Sciences. Volume 170 Issue International Conference on Bioelectric Impedance, Pages 724 – 732, 1970.
5. Cardiac output measured by transthoracic impedance cardiography at rest, during exercise and at various lung volumes. Edmunds AT, Godfrey S, Tooley M. Clinical Science 63, (107–113), 1982
6. Clinical evaluation of impedance cardiography. D. S. Goldstein, R. O. Cannon III, R. Zimlichman, H. R. Keiser. Clinical Physiology and Functional Imaging. Volume 6 Issue 3, Pages 235 – 251, 1986
7. Impedance Cardiography, Joseph M. Van De Water, Timothy W. Miller, Robert L. Vogel, Bruce E. Mount, Martin L. Dalton, Chest vol. 123, 2028-2033, 2003
8. Quality of out-of-hospital cardiopulmonary resuscitation with real time automated feedback: A prospective interventional study. Jo Kramer-Johansen, Helge Myklebust, Lars Wik, Bob Fellows, Leif Svensson, Hallstein Sørebo, Petter Andreas Steen

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The products described in this brochure all meet the applicable European Medical Directive requirements.

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H009-020-001-0

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U.S. Federal law restricts this device to sale by or on the order of a licensed practitioner.



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