CPR Advisor™ ICG technology

Overview

When CPR treatment is provided to a victim of sudden cardiac arrest, it is vital the chest compressions are of a good quality. If the quality of the CPR provided is good, the chances of successfully resuscitating a patient are greatly increased[1].

Research has demonstrated that non-professional responders regularly provide ineffective CPR due to inexperience[2-3].

The HeartSine samaritan PAD 500P (SAM 500P) with CPR Advisor provides real-time feedback to the rescuer on the force and rate of the CPR they are providing to the victim during a sudden cardiac arrest (SCA) resuscitation. The SAM 500P uses both audible and visual feedback to provide instructions to the rescuer.

CPR Advisor provides feedback to the rescuer on the force and rate of compressions the rescuer is providing to the victim via the defibrillator electrodes, without the addition of accelerometers (or pucks).

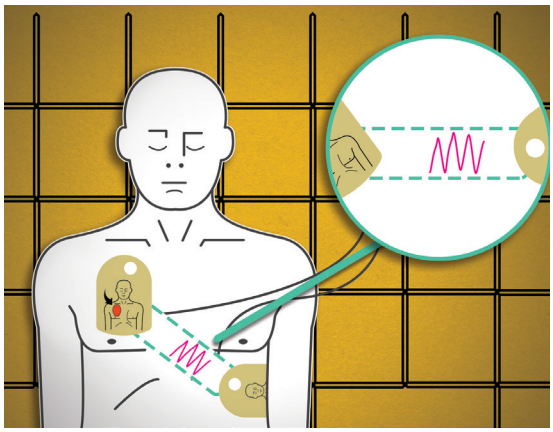

Figure 1. HeartSine's defibrillator detects changes in patient impedance.

How CPR Advisor works

When a patient collapses and a rescuer performs CPR, the compressions applied by the rescuer cause the patient's chest to change shape and result in a change to the patient's ICG (impedance cardiogram) waveform[4]. CPR Advisor captures the change in the ICG waveform which it uses to count the number of compressions a rescuer administers and identify the quality of the compressions being applied.

By counting deflections in the ICG waveform, CPR Advisor determines the compression rate and advises the rescuer to "Push faster" if the compression per minute (CPM) rate is below that recommended by the ERC/AHA guidelines. Likewise, if the rescuer's CPM rate is greater than that recommended by the ERC/AHA guidelines, CPR Advisor will tell the rescuer to "Push slower" (see Figure 2).

When the rescuer compresses the patient's chest, the amplitude of the deflection is reflected on the ICG waveform. The greater the amplitude, the greater the deflection. CPR Advisor measures the change in impedance and uses this to determine the appropriate feedback to the rescuer; advising the rescuer to "Push harder" or acknowledging "Good compressions" (see Figures 3 and 4).

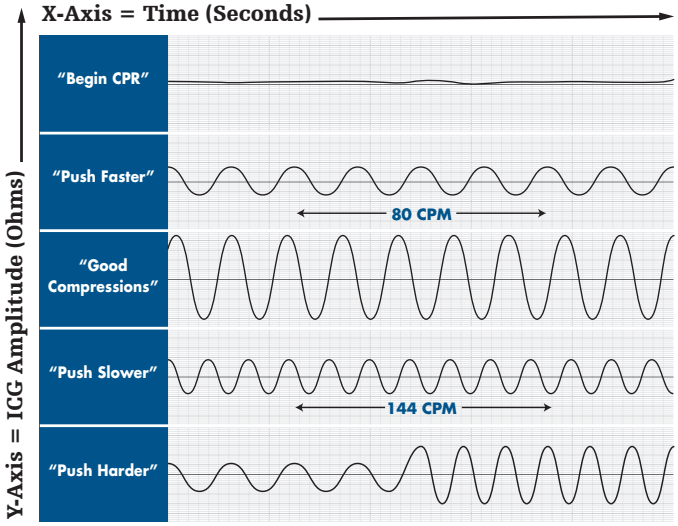

Figure 2. CPR Advisor determines compression quality to advise rescuer.

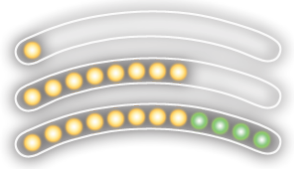

Figure 3. Visual indicators let the user know if effective CPR is administered.

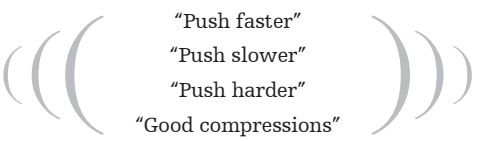

Figure 4. Voice prompts let the user know if chest compressions are being given correctly. Aural "clicks" help the user keep time.

This real-time feedback is important as even though most trained rescuers understand the need to push hard and push fast, rescuer fatigue may set in after as little as one minute, resulting in slower compression rates[5]. The SAM 500P provides feedback to the rescuer via both visual indicators on the SAM 500P user interface and audible voice prompts.

A widely accepted standard for measuring efficacy, or effectiveness, of CPR is End Tidal CO_2; that is, measuring the amount of carbon dioxide (CO_2) exhaled by the patient. CPR Advisor has been demonstrated to correlate very well with the End Tidal CO_2 measurement, as well as other vital signs, demonstrating that this technology is a strong indicator of CPR efficacy [4,6-10].

Improved CPR efficacy

Effective CPR, provided alone or together with a lifesaving shock, can increase the chance of survival[11]. CPR Advisor, in conjunction with the metronome, is intended to help rescuers perform CPR in line with the ERC/AHA guidelines by monitoring their real-time CPR performance and providing feedback to guide them to perform quality CPR.

Integrated CPR Advisor helps improve compliance with resuscitation guidelines. And because CPR Advisor is integrated within HeartSine SAM 500P, a lifesaving shock can be delivered if needed.

References

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All claims valid as June 2021.

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Emergency Care Public Access

AED users should be trained in CPR and in the use of the AED.

Although not everyone can be saved, studies show that early defibrillation can dramatically improve survival rates. AEDs are indicated for use on adults and children. AEDs may be used on children weighing less than 25 kg (55 lb) but some models require separate defibrillation electrodes.

The information presented is intended to demonstrate Stryker's product offerings. Refer to operating instructions for complete directions for use indications, contraindications, warnings, cautions, and potential adverse events, before using any of Stryker's products. Products may not be available in all markets because product availability is subject to the regulatory and/or medical practices in individual markets. Please contact your representative if you have questions about the availability of Stryker's products in your area. Specifications subject to change without notice.

CE 0123 HeartSine samaritan PAD is CE marked (class IIb – 0123) in accordance with EU MDD 93/42 and other applicable directives. It will reclassify to CE class III – 0123 in accordance with the EU MDR on or before the end of the MDR transition period May 2024.

UL Classified. See complete marking on product.

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HeartSine SAM 500P is not available for sale in the U.S.

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