



# Improving CPR with every compression



## Henderson Fire Department, Nevada

Since implementing Philips Q-CPR in 2009, Henderson, Nevada, Division Chief of EMS Scott Vivier has seen an improvement in cardiac arrest survivability and neurologically healthy discharges for his patients.\* Q-CPR is a CPR improvement solution that gives real-time feedback to CPR providers. Its visual display and auditory cues tell medics if their compression depth, recoil, and rate are correct. The feedback from Q-CPR helps providers give consistent, high-quality CPR in line with the latest American Heart Association guidelines.

In addition to real-time feedback, after the cardiac arrest is over, HeartStart Event Review Pro analyzes the data and produces a CPR report card so providers can learn from and improve on their performance. “Q-CPR with Event Review Pro was the first set of tools that gave us great feedback on the types of compressions we were providing,” Vivier said. “Implementation of the device helped us save lives.”

### A game-changer

Henderson has a population of 270,000, second only in Nevada to its neighbor, Las Vegas. The Henderson Fire Department is the primary 911 and advanced life support (ALS) transport service for the city, which covers 104 square miles.

Henderson Fire fields about 25,000 calls per year and around 20,000 of those are for medical problems. In 2008, Vivier went looking for a technological solution that would help his department improve its CPR and bring it in line with AHA guidelines for consistency, depth and rate of compressions. “We were looking for a

solution that was able to give us real-time CPR feedback,” Vivier said. “Q-CPR fit that bill.” Vivier considered mechanical CPR devices, but decided they were too expensive and not necessarily more effective than manual CPR done correctly.

Vivier put Philips HeartStart MRx monitors on every ALS truck, each with a Q-CPR device. At first, some of the medics in the department were skeptical of the new tools.

“I’ve been doing CPR for 15 years. I know how to do CPR,” Michael Charlton, a firefighter paramedic who has been

working in EMS since 1992, recalled thinking. But Charlton and the rest of the department were taken aback when they started using Q-CPR.

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*Scott Vivier*

*Chief of EMS*

*Henderson Fire Department, Nevada*

\* Based on the results at Henderson Fire Department.

# PHILIPS

“Our providers were surprised at how poor their CPR was,” Vivier said. “First of all, they were going in way too fast. The second thing that they were surprised to find was that they got tired very quickly, and they weren’t pushing hard enough.”

Starting in 2005, the Henderson Fire Department had instituted a team-based approach to cardiac arrest, a recommendation included in the American Heart Association’s 2013 Consensus Statement on CPR quality.<sup>1</sup> The team is divided into four roles: compression technician, monitor technician, ventilator technician, and medication technician. The team members trade the role of the compression technician every two minutes to make sure they don’t tire and lose compression depth.

Using Q-CPR, they can keep the depth and rate of their compressions consistent throughout the call. For adults, this means 100 compressions per minute at a depth of 1.5-2 inches, and allowing a complete chest recoil after each compression. Q-CPR uses auditory and visual cues to keep compression technicians within these guidelines.

Henderson Fire medics embraced the device, and now won’t perform CPR without it. “It’s not just some tool that we keep in the bag,” said Beau Mentley, a firefighter paramedic. “I don’t want to be in a cardiac arrest where I’m not using Q-CPR.”



Photo credit: Henderson Fire Department.

## How Q-CPR can help you meet AHA guidelines

In June 2013, the American Heart Association released a consensus statement titled “CPR Quality: Improving Cardiac Resuscitation Outcomes Both Inside and Outside the Hospital.” The consensus statement identifies five critical components of high-quality CPR:

- Minimize interruptions in chest compressions
- Provide compressions of adequate rate
- Provide compressions of adequate depth
- Avoid leaning between compressions
- Avoid excessive ventilation

Philips HeartStart MRx with Q-CPR is the only solution on the market that provides ventilation feedback as well as compression rate and depth. Q-CPR can help providers be sure they’re providing CPR that meets the AHA quality guidelines, on every resuscitation.

The consensus statement also calls for “continuous quality improvement on provider, team, and systems levels.” Philips analytic tool HeartStart Event Review Pro gives you metrics to determine your department’s performance, so you know where to focus your improvement efforts.

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*Beau Mentley*

*Firefighter paramedic*

*Henderson Fire Department, Nevada*

Now, when medics hand off patients to the emergency department, they often notice imperfections in the hospital staff’s CPR technique. “I’ve used Q-CPR and kept the pads and the monitor on the patient, and I’ve let the doc see the real-time feedback from the device,” Mentley said.

In the days and weeks after a cardiac arrest, Event Review Pro lets Vivier drill down into the data produced by

Q-CPR to learn from past experience. “We were able to analyze the whole cardiac arrest and send them out a report card,” Vivier said. “The crews really take that to heart and they implement that feedback into their daily practice.” “It was a game-changer for us,” said Charlton. “It drastically changed the way the medics were doing CPR.”



### See it, hear it, do it

Q-CPR gives you the opportunity to respond immediately to visual and audio feedback.

### Results

Q-CPR has helped the Henderson Fire Department improve their care for cardiac arrest patients. Using Q-CPR, Henderson medics have seen an increase in end-tidal CO<sub>2</sub> and perfusion, as well as return of circulation, in patients receiving CPR.

The rates of patients surviving to discharge and of neurologically healthy patients have also increased since Henderson implemented Q-CPR, expanded the availability of AEDs and induced hypothermia in cardiac arrest patients.

In 2008, 25 percent of patients presenting with V-tach or V-fib were discharged alive. In 2011, that number rose to 46 percent. The percentage of patients released in good neurological condition rose from 12.5 percent to 36 percent over the same period.



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*Beau Mentley*

*Firefighter paramedic*

*Henderson Fire Department, Nevada*

Vivier attributed the improvement in patients’ neurological health to the department’s better CPR. “We do know that good neurological outcome is directly a measure of the percentage of good CPR,” he said. For the medics, the real-time feedback from Q-CPR,

and the longer-term analytics provided by HeartStart Event Review Pro, has meant being able to deliver high-quality patient care. “It’s such a good tool for us to do the best that we can,” Mentley said. “That’s what we’re about, giving the best care that we can.”

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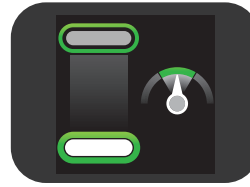
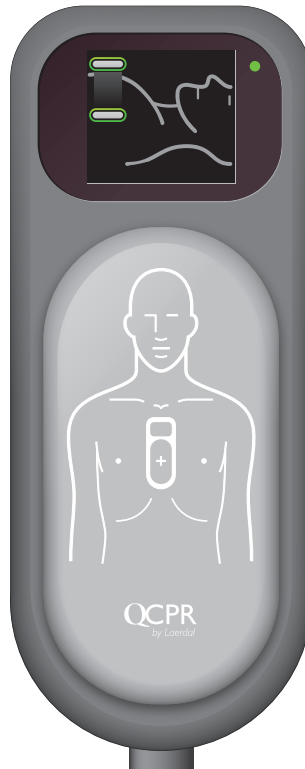
*Henderson Fire Department, Nevada*

## What is Q-CPR?

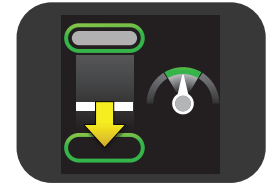
The Q-CPR measurement and feedback tool uniquely provides corrective guidance on both the compression and ventilation components of CPR to help you reduce the likelihood of hyperventilation during resuscitation.

- Optimized for AHA/ERC 2010 CPR Guidelines. MRx display can be configured to display either standard for depth and rate.
- Delivers instant audiovisual feedback of compression depth and rate, complete chest recoil, hands-off time and ventilation rate.
- Stores data captured during actual cardiac events to help you fine-tune your technique.

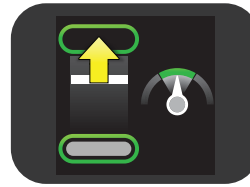
The Q-CPR meter helps provide that every compression meets depth, rate, and complete release targets that may help improve the patient's chance of survival and increase the opportunity for a complete neurological recovery.<sup>2</sup>



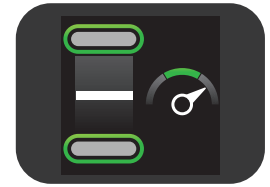
Good compressions



Compress deeper



Release pressure between compressions



Compress slower

## Q-CPR at a glance

Ventilation rate	Philips exclusive
Ventilation feedback from bag valve mask (BVM) or intubation	Philips exclusive
Chest compression depth – too shallow	Yes
Chest compression rate high	Philips exclusive
Chest compression rate low	Yes
Complete chest recoil	Yes
“Hands-off” time	Yes
Compliant vs. non-compliant surface capability	Yes

1. Meaney PA, Bobrow BJ, Mancini ME, et al. Cardiopulmonary resuscitation quality: improving cardiac resuscitation outcomes both inside and outside the hospital: a consensus statement from the American Heart Association. *Circulation*. 2013 Jul 23;128(4):417-35.
2. Ko PC, Chen WJ, Lin CH, et al. Evaluating the quality of pre-hospital cardiopulmonary resuscitation by reviewing automated external defibrillator records and survival for out-of-hospital witnessed arrests. *Resuscitation*. 2005;64:163-169.

Please visit [www.philips.com/improvingcpr](http://www.philips.com/improvingcpr)



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