

## DRAMATICALLY IMPROVED CARDIAC ARREST RATES

Out-of-hospital cardiac arrest survival rates in the United States hover at 5–6%. But during the past two years, Cypress Creek EMS (CCEMS), a large combination ALS service in north, suburban Houston, has instituted several innovations that have bumped its cardiac arrest survival rate to 15%—not to hospital arrival, but to hospital discharge, neurologically intact.

CCEMS prides itself on keeping abreast of the latest research, and in mid-2004—a year before the American Heart Association published its new CPR guidelines—CCEMS changed its protocols. “We caught eight tons of flack about it,” says **Wren Nealy**, EMT-P, CCEMS director of special operations.



Crews were instructed to give two minutes of CPR before defibrillation, use deeper and faster compressions, decrease ventilation and minimize hands-off intervals. “We don’t allow paramedics to stop compressions except to analyze the rhythm or to shock,” says CCEMS Clinical Manager **Greg Wolf**, LP.

In mid-2005, “as soon as it was FDA approved and available for use,” Nealy says, CCEMS began using ResQPOD, a small impedance threshold device that increases negative pressure in the patient’s chest during CPR and increases circulation. Although the device is disposable, he says, “When you look at all the costs of a resuscitation, the ResQPOD is worth the \$100, because you often get the patient back quicker so you don’t need to throw the whole kitchen sink at them.”

Last June, CCEMS began a new STEMI Alert program that allows paramedics to activate the cardiac catheterization lab at Houston Northwest Medical Center (HNMC). “Our paramedics are not transmitting their EKGs,” Wolf says. “The cath lab is being activated 24/7 on the paramedic’s interpretation.”

Since then, Nealy says, “We’ve had 41 activations and no false activations.” Hospital door-to-balloon time for those patients averaged 47 minutes, and it averaged only 87 minutes from when the 9-1-1 call was answered until the patient gets primary percutaneous cardiac intervention (PCI).

“We did a lot of research and a lot of talking with cardiologists and emergency physicians about what we need to do in the field if we bypass the ER,” Wolf says. As a result, paramedics who detect a STEMI prepare the patient for PCI by giving them two doses of a lopressor and a bolus of heparin in the ambulance.

“In the past month, we had four patients in cardiac arrest at the time of paramedic arrival,” Nealy says. “The paramedics got return of spontaneous circulation, provided a 12-lead ECG, [and] detected a STEMI, and all four bypassed the ER and went straight to the cath lab.



All four are now alive and fully neurologically intact.” He notes that one of those patients got PCI just 17 minutes after CPR.

Nealy and Wolf are quick to point out that CCEMS medical director **Levon Vartanian**, MD, deserves a lot of credit for the innovations and improved cardiac arrest survival rate. Vartanian is a former paramedic. —MG JEMS

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