

## Improving Survival In Out-of-Hospital Cardiac Arrest

Out-of-hospital cardiac arrest affects 250 to 500 individuals each day across the United States. In many instances, the arrest is a sudden event with no prior recognition of cardiac disease. The standard approach to cardiac arrest is the American Heart Association Chain of Survival model with four main links: early recognition (call 911), bystander CPR, early defibrillation and early ALS. Unfortunately, the median survival rate from cardiac arrest remains low at 6.4 percent and has not changed much over the last 20 years.

To improve the understanding of the best methods of treatment for out-of-hospital cardiac arrest, OHSU, along with local EMS and health system partners, will participate in a study in the Portland-Vancouver metropolitan area to test two methods of increasing blood flow to the heart and brain. The ROC PRIMED study is the next in a series of federally funded studies conducted by the Resuscitation Outcomes Consortium (ROC).

The first treatment to be studied is the Impedance Threshold Device (ITD). The ITD is a CPR enhancement device that attaches to the face mask or advanced airway (endotracheal tube, King LT, LMA, Combitube) during CPR. The ITD enhances the intrathoracic vacuum created during the decompression phase of CPR, which leads to increased blood flow back to the heart, allowing more blood to move forward during the compression phase.

An observational study as well as one randomized controlled trial has shown improved short-term survival benefit

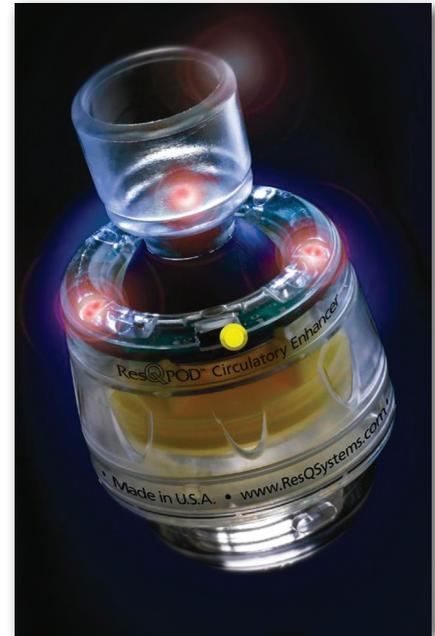
with the ITD. Individuals eligible for the ROC PRIMED study will randomly receive either CPR with the ITD or CPR with a sham device.

The second part of the study will look more specifically at the circulatory phase of CPR, which occurs between five and 15 minutes following a cardiac arrest. Small randomized or observational human studies have suggested that some period of CPR (90 to 180 seconds) prior to any defibrillation attempt increases survival during this time. Immediate defibrillation is associated with lower survival.

The pathophysiology for this remains unclear, but it may involve delivery of substrates including oxygen to the globally ischemic heart or the washout of deleterious metabolic factors that have built up during ischemia. Subjects in the ROC PRIMED study will randomly receive either 30 to 60 seconds of CPR or three minutes of CPR before having their heart rhythm assessed to determine if defibrillation is indicated.



*OHSU is participating in a study to test how methods such as the Impedance Threshold Device (ITD), above, can increase blood flow to the heart and brain during out-of-hospital cardiac arrest.*



*The Impedance Threshold Device (ITD) attaches to the face mask or advanced airway tube during CPR.*

### For More Information

Portland was designated as a ROC community by the National Institutes of Health in 2004. For more information about the ROC Primed Study and OHSU's involvement, please visit [www.ohsu.edu/emergency/roc](http://www.ohsu.edu/emergency/roc).

ROC investigators hope to enroll about 600 people annually in the ROC PRIMED study. The ROC consortium, as a whole, would like to enroll about 15,000 people.

The study will be conducted under the Food and Drug Administration guidelines for exception to informed consent. The study will also be reviewed and approved by local Institutional Review Boards. The knowledge gained should help guide treatment for future cardiac arrest victims in the Portland community and elsewhere.

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