



6

# HeartRescue Global

## Policy Brief

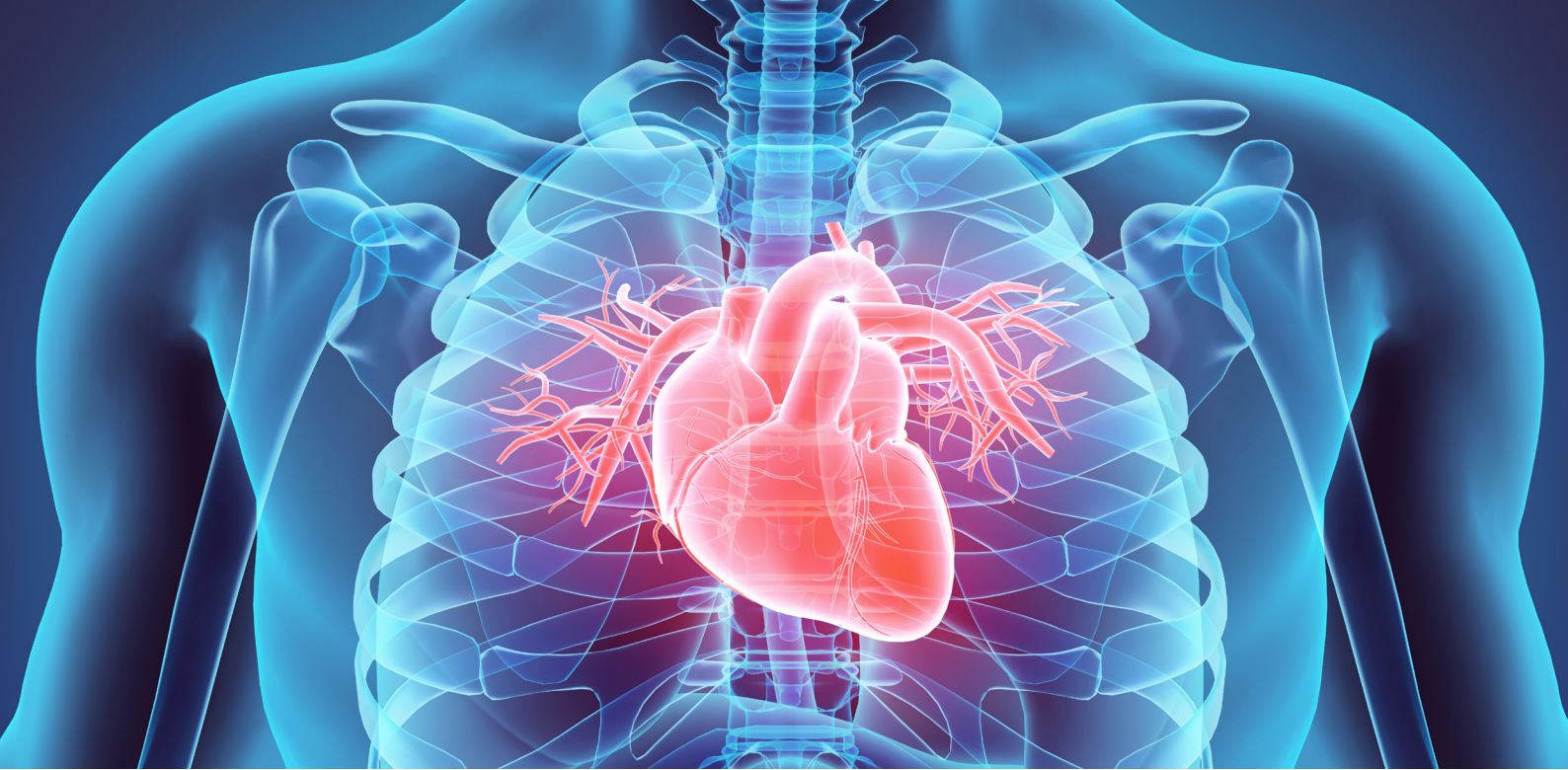
### Out-of-Hospital Cardiac Arrest (OHCA)



## ACKNOWLEDGEMENTS

This analysis was produced by RTI International in partnership with the Medtronic Foundation. For over 50 years, RTI has been committed to improving the human condition by turning knowledge into practice. The Medtronic Foundation focuses on expanding access to quality health care among underserved populations worldwide, as well as supporting health initiatives in communities where Medtronic employees live and give.





## WHAT IS OHCA?

Out-of-hospital cardiac arrest (OHCA) happens when a person's heart suddenly stops pumping blood. The person's pulse and blood pressure are instantly lost and he or she will die within minutes without immediate treatment.

## HOW IS OHCA TREATED?

If CPR is initiated for the OHCA victim within the first few minutes and defibrillation performed within 10 minutes of collapse, there is a much greater chance of survival and good functional outcome. And the quicker help arrives, the better the chance the victim will survive with full neurological function.

The good news is that CPR and defibrillation can be provided to the OHCA victim by anybody—including family members, coworkers, bystanders, and health care professionals—regardless of their level of training or certification. The key is for as many people as possible in all countries around the world to be trained and willing to perform CPR and use an AED.

Consequently, it is essential to have AEDs widely available for the public to use in settings where many people may be gathered, such as airports, train stations, offices, businesses, and schools. That way, AEDs and CPR are more likely to be used to treat OHCA within the very short time window of the first 10 minutes after someone collapses with OHCA.

Also, everyone in all countries needs to be trained to call the emergency telephone number (such as 120 in China, 108 in India, 192 in Brazil, and 911 in the United States) as soon as possible if someone collapses suddenly and is not breathing normally. Promptly notifying emergency medical services (EMS) allows them to arrive quickly to take over treatment of the OHCA patient.



# Who Suffers from OHCA?

OHCA usually happens to people with heart disease, but it can also happen to anyone at any time.

In the United States, OHCA events occur approximately:<sup>1</sup>

70%  
AT HOME

10%  
IN PUBLIC SETTINGS

10%  
IN NURSING HOMES OR  
ASSISTED LIVING SETTINGS

With some events occurring in other locations

While about **50%**

of these events are witnessed by a family member or bystander,

the number of people that have an OHCA event and receive timely CPR varies widely among different communities in the United States; from less than 10% up to about 75%.<sup>2</sup>



The number of persons with OHCA receiving timely CPR in other countries is often lower.

## Why is OHCA such a big problem for its victims worldwide?

OHCA is more severe than a "heart attack" because there is a complete loss of pumping activity of the heart. When a person has a "heart attack" they have some blockage of the heart, but the heart continues pumping and the person often remains awake and may complain of chest pain. With OHCA, the person is not awake.

In 2015, CVD was responsible for

**6x**

as many deaths as these three combined<sup>3</sup>



HIV



malaria



tuberculosis



**CVD**

is a leading cause of mortality worldwide



Because the chance of survival decreases by approximately 10% for every minute after someone collapses from OHCA, the time between OHCA and the use of CPR and AED largely predicts the chance of the victim's survival.

# WHAT IS THE CHAIN OF SURVIVAL APPROACH FOR OHCA?

One way to describe the multiple steps needed for OHCA treatment is called the **Chain of Survival**:



## STEP 1

**Step 1:** A family member or bystander calls an emergency telephone number to activate EMS.



## STEP 2

**Step 2:** An emergency medical dispatcher is responsible for identifying the OHCA event, sending the correct level of EMS help, and offering instant CPR and AED instructions over the telephone for family members or bystanders to be able to provide treatment right away, before EMS providers arrive.



## STEP 3

**Step 3:** EMS providers arrive and begin treatment with basic and/or advanced life support.

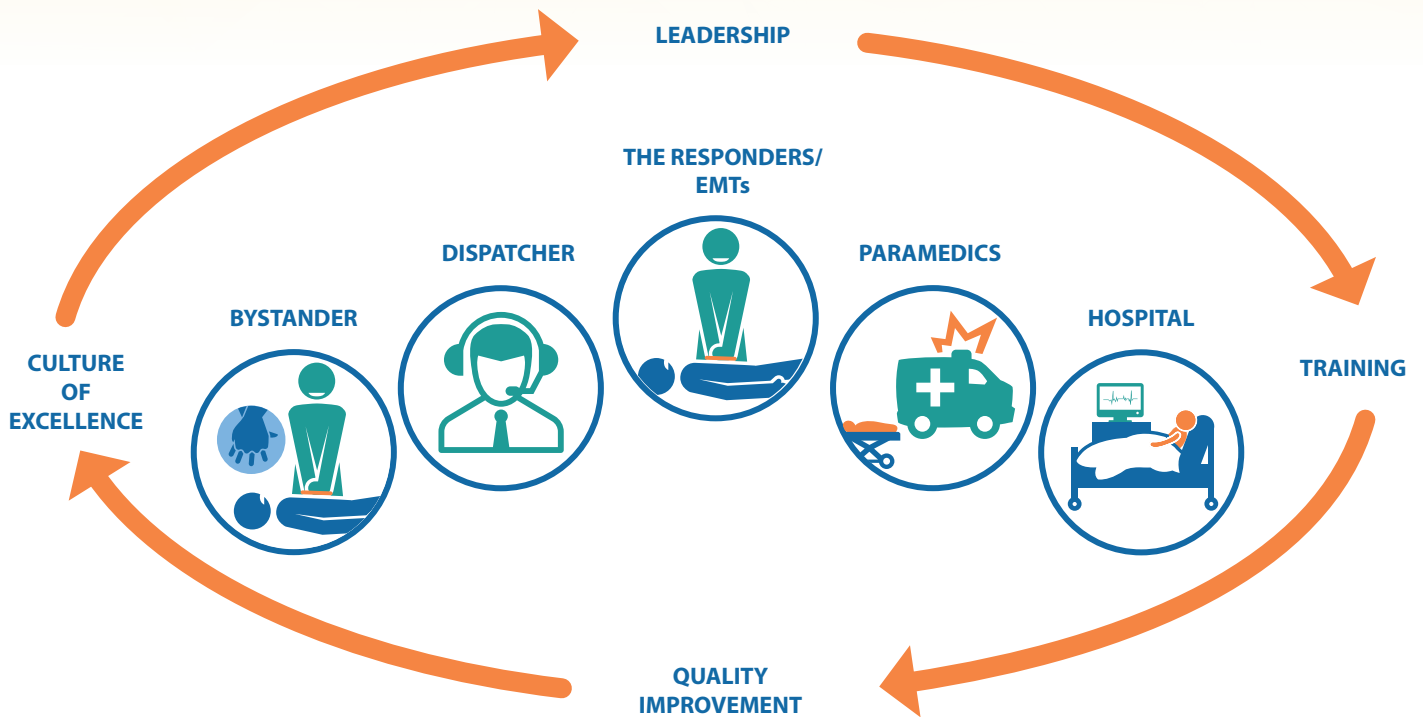


## STEP 4

**Step 4:** If the person survives, additional treatment is provided by EMS providers at the scene and continues during emergency transportation to a hospital.

The American Heart Association recommends implementing an integrated system of care for OHCA that includes family, community, EMS, and hospital efforts to improve processes and outcomes of care for patients with OHCA. This system of care is shown in **Figure 1**.

**Figure 1. Integrated System of Care for Out-of-Hospital Cardiac Arrest**



## **WHAT ARE THE BARRIERS TO SAVING LIVES WITH AN OHCA SYSTEM OF CARE?**

Implementing a high-functioning and integrated OHCA system of care presents challenges and barriers at each level of care, from the community (where family members, coworkers, and bystanders need to recognize the OHCA event and act with CPR and AED), to emergency medical dispatchers, emergency medical services, hospitals, and health systems. Data collection systems and quality of care improvement programs are also needed.

While the details of the challenges and barriers may differ between nations, cultures and communities, they generally fall into several categories that represent opportunities for policy action, education and training, and systems of care improvement. The common barriers to developing an OHCA system of care and some potential solutions are shown on the following page.





## Community Level

Common Barriers	Potential Solutions
Lack of family members, coworkers, and bystanders who can perform CPR	Widespread public CPR training
Fears about performing CPR correctly	Broad training to teach the public how to perform CPR and use an AED
Fear about legal liability and concern about needing a certification to do CPR	Effective laws protecting the public from litigation, such as Good Samaritan laws
Concern about contracting diseases when doing mouth-to-mouth ventilation with CPR	Broad training to inform the public of the lack of danger regarding doing CPR, and how to do compression-only CPR
Lack of public access to AEDs	AEDs placed strategically in high-profile public locations
Insufficient education on CPR and AEDs	Well-supported, easily available, ongoing training for the general public on CPR and AEDs
Lack of funding to purchase AEDs and train the public on how to use them	Integration of AEDs into community response programs for OHCA
No system for maintaining AEDs	Public-private partnerships to support purchase, maintenance, and tracking of AEDs
Lack of local and state government support and commitment for sustainability	Informing government officials of the need for and usefulness of an organized system of care for OHCA



## Hospital Level

Common Barriers	Potential Solutions
Lack of comprehensive care for OHCA patients	Implement clinical protocols to provide comprehensive care for OHCA patients



## EMS Level

Common Barriers	Potential Solutions
Inadequate budget and staffing resources to implement an OHCA system of care	Increase public and local governmental support for an OHCA system of care
Lack of understanding for why change is needed to develop an OHCA system of care	Disseminate information on the benefits of an OHCA system of care to the public, policymakers, and EMS leadership
Insufficient quality review or quality improvement programs for an OHCA system of care	Disseminate information to policymakers and train EMS managers regarding quality of care management for OHCA treatment
Poor quality CPR by EMS providers	Enhanced training and QI programs



## Emergency Dispatch-Level

Common Barriers	Potential Solutions
Delayed identification of the OHCA victim	Enhanced training for emergency dispatchers
No formal dispatch protocols for OHCA	Use of guideline-based dispatch protocols
Lack of training for dispatcher-led telephone-assisted CPR	Regular dispatcher training on providing telephone-assisted CPR to family members, coworkers, and bystanders who call about OHCA emergencies



## Health System Level

Common Barriers	Potential Solutions
Conflicting interests of hospitals, EMS, and government agencies	Cooperative agreements between hospitals, EMS systems, and government agencies
No data collection or reporting system for OHCA treatment	Continuous data collection and evaluation on the incidence, processes of care, and outcomes for OHCA

## REFERENCES

<sup>1</sup>Vellano K., Crouch A., Rajdev M. and B. McNally, For the CARES Surveillance Group. (2015). Cardiac Arrest Registry to Enhance Survival (CARES): Report on the Public Health Burden of Out-of-Hospital Cardiac Arrest. Washington, DC: Institute of Medicine.

<sup>2</sup>McNally B., Robb R., Mehta M., Vellano K., Valderrama A., Yoon P., Sasson C., Crouch A., Perez A., Merritt R. and A. Kellerman. Out-of-Hospital Cardiac Arrest Surveillance — Cardiac Arrest Registry to Enhance Survival (CARES), United States, October 1, 2005–December 31, 2010. *Morbidity and Mortality Weekly Report*; July 29, 2011 / 60(SS08); 1-19.

<sup>3</sup>GBD 2015 Mortality and Causes of Death Collaborators. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet* 2016; 388:1459-544.



## Authors:

Michael Trisolini, PhD, MBA

Bentley Bobrow, MD, FACEP

Elizabeth Tant, MSc

May 2019

## HeartRescue Global Project Partners



For more information contact

Elizabeth Tant

[etant@rti.org](mailto:etant@rti.org)

919-316-3995