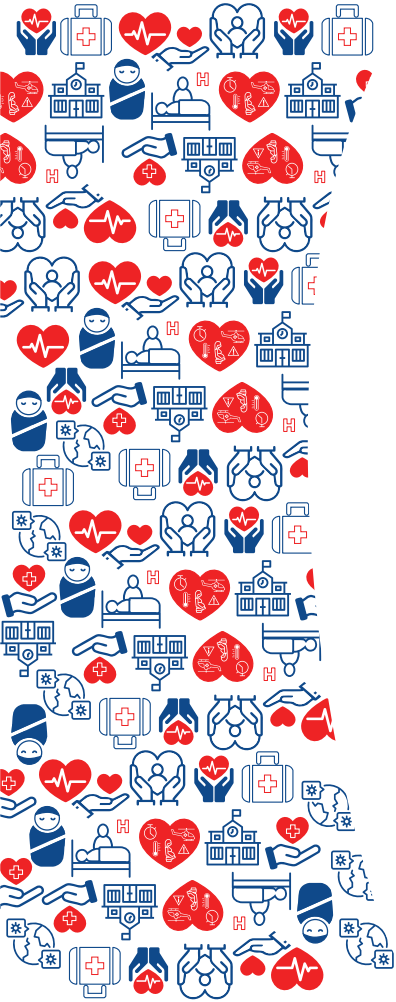
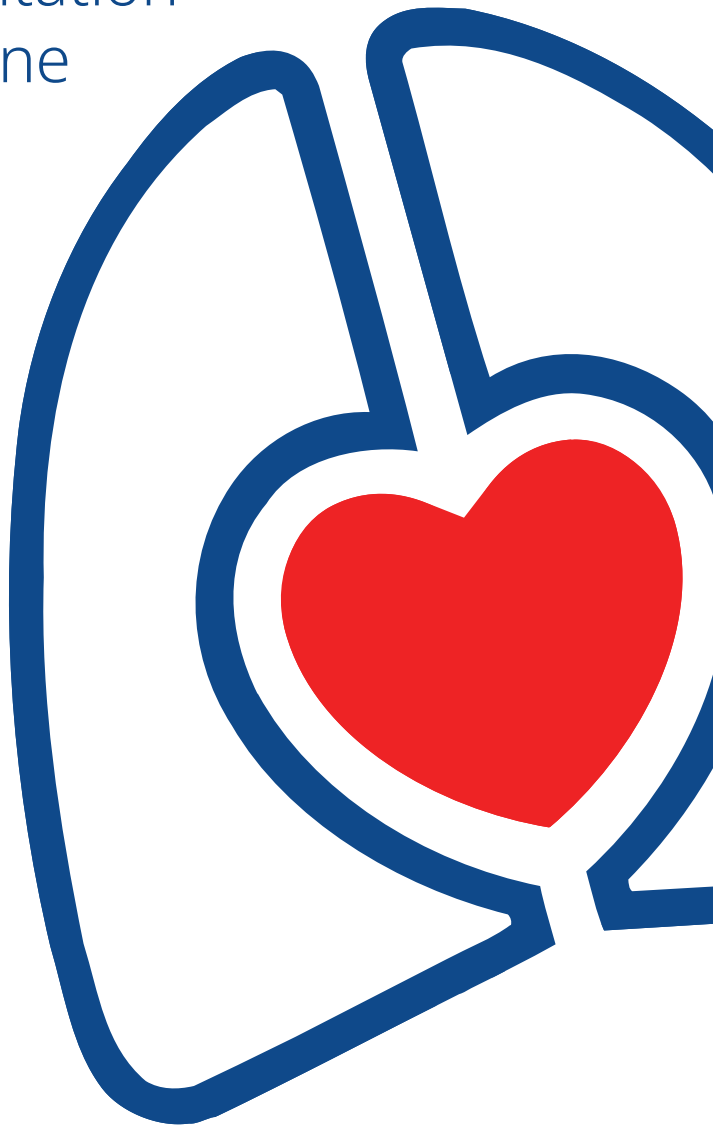
GUIDELINES 2025

EUROPEAN RESUSCITATION COUNCIL©

The ERC Guidelines 2025 on Resuscitation for Everyone





Content

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Introduction

The European Resuscitation Council presents this brochure about the 2025 Guidelines on Cardiopulmonary Resuscitation (CPR). It has been written and produced for the general public, describing the immediate responses needed when someone experiences a cardiac arrest. What happens in the first few minutes is a matter of life and death.

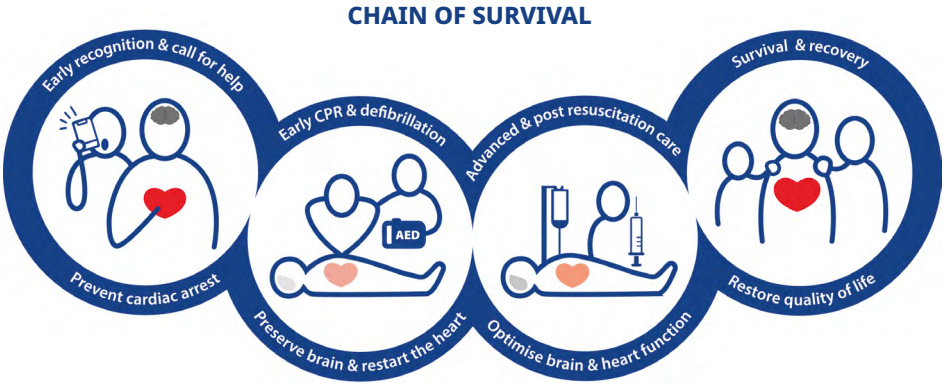
When someone's heart stops, these moments are the most important. Very often the first person able to help is not a physician or a nurse: in the vast majority of events, it is a family member, friend or bystander who knows CPR who is called upon to act.

The brochure will:

- Explain in plain language when and how to perform CPR, because knowing what to do gives bystanders like you the abilities and the confidence to act to save a life.
- Share the latest and best resuscitation science, protocols and techniques for performing life-saving measures, including CPR.
- Empower and inspire ordinary people across Europe to become potential lifesavers, making our communities safer.
- Encourage everyone to seek out practical, hands-on lifesaving training and CPR courses available right in their community.

The core aim of the European Resuscitation Council (ERC) is to preserve human life by making high-quality resuscitation available to all. Over the last 35 years, the ERC has established standards for resuscitation guidelines and training. Working in close collaboration with a network of National Resuscitation Councils, the ERC delivers public campaigns promoting awareness of cardiac arrest and how anybody can learn the techniques to rescue a person in need. This new brochure is for several different audiences: interested members of the public, political decision-makers, healthcare administrators, and others.

The ERC programmes are based on the most recent resuscitation science. That is why, the ERC works directly with the International Liaison Committeeon Resuscitation (ILCOR), a respected research group, to evaluate new scientific developments and discoveries in the field. Many of these advances in resuscitation science are presented and discussed at the ERC's annual international congress and are later published as part of the yearly Consensus on Science and Treatment Recommendations (COSTR), as well as in the ERC's own publications, *Resuscitation and Resuscitation Plus*.



Since 1992 the European Resuscitation Council uses the latest research into its resuscitation guidelines, to achieve one of its core aims, teaching as many people as possible the most up-to-date lifesaving skills. Every five years, the ERC updates its public resuscitation guidelines to ensure all recommended procedures and protocols are based on the latest research, technology and best practices. This constant improvement has one simple goal: to save more lives. These regularly updated resuscitation guidelines serve as the backbone for all ERC initiatives.

At the heart of the guidelines is the Chain of Survival, first presented 20 years ago as a way to simply and graphically highlight the essential and urgent actions needed to maximise chances of survival after cardiac arrest. The four links of the chain have been revised for 2025 to include recent advances in resuscitation science in prevention, dispatcher guidance, first response systems, survivor support, and recovery.

The first ring focuses on preventing cardiac arrest from happening in the first place and on the importance of fast recognition of a medical emergency when they occur so people can get help immediately. The next ring emphasises early CPR and defibrillation, which combines the two critical actions in basic life support, keeping the blood circulating while acting to get the heart and brain working again as soon as possible. The third ring represents the specialised medical care provided by professionals to stabilise the person and protect their brain and heart function. The final fourth ring highlights the long-term process of recovery after a cardiac arrest and focuses on the importance of supporting the survivor and their supporters to improve their quality of life.

The European Resuscitation Council publishes this layperson brochure on the new 2025 resuscitation guidelines for several crucial reasons, all with the aim of preserving human lives by making high-quality resuscitation available to all. By providing clear, concise, and easy-to-follow instructions, these Guidelines can empower more people to act in an emergency, increasing the likelihood of survival after cardiac arrest.

For more information about ERC public awareness and teaching campaigns, including "Kids Save Lives," "Restart a Heart Day," or the "Get Trained, Save Lives," visit the ERC website at www.erc.edu

ABOUT THIS BROCHURE

This user-friendly booklet is a simple, accessible resource for people in the community. It translates complex scientific information into practical, actionable steps that anyone can follow. For those without formal CPR training, it is an introduction and a first step toward finding suitable local training, and as a useful supplement to existing CPR courses, reinforcing key messages, and providing a quick reference. It includes updates on key topics relevant to the public including guidance on recognising and responding to cardiac arrest, the elements of Basic Life Support, as well as essential First Aid techniques to address other life-threatening circumstances such as drowning, choking, and trauma due to accident. Through education and training, we can build public confidence and willingness to step up when anyone, a loved one or a stranger, requires lifesaving help, overcoming the practical, psychological, and emotional barriers to resuscitation. The goal is to create communities of lifesavers.

To view the detailed scientific articles by and for healthcare professionals and researchers which underpin the revisions contained in ERC Guidelines 2025, visit the website of ERC's publication Resuscitation *(www.resuscitationjournal.com)*

At the heart of the ERC Resuscitation Guidelines 2025 is a simple idea: Training people to recognise an emergency, perform chest compressions and use an automated external defibrillator can help save many more lives. To ensure that this easy-to-apply knowledge and these skills to save a life are out in the community, ERC advocates broad-based public outreach and education. It calls for these courses to be led by certified instructors who can guide and support trainees through the process, enhanced by self-directed learning and ongoing support and re-training.

Here is a summary of the topics covered in this brochure about the ERC 2025 Guidelines. Please refer to the individual chapters for greater detail.

Epidemiology in Resuscitation

Sudden cardiac arrest is one of the leading causes of death throughout Europe. However, the types and frequency of cardiac arrest as well as the likely health outcomes differ widely across European countries. This Guideline on the epidemiology of resuscitation summarises important data about how often cardiac arrest happens, who is affected, how local and national systems are able to respond, and crucially, what happens after resuscitation. The Guideline goes further, examining various common causes of cardiac arrest (including genetic factors) as well as the long-term experiences and health of survivors of cardiac arrest, their caregivers, and of rescuers involved.

Systems Saving Lives

This section focuses on a systems approach to cardiac arrest and recommends changes to build and improve each link in the Chain of Survival. It looks at how scientific research, constant training, and large and small system improvements all together

can result in the best possible survival outcomes. It also focusses on best evidence and practices and calls for active public education, ensuring people of all ages and backgrounds are able and ready to perform CPR and other lifesaving techniques. This training is necessary to ensuring bystanders are psychologically and emotionally prepared to step forward to save a life. Key recommendations include educating young people very early, dispatching volunteer rescuers via mobile phone, and creating dedicated cardiac arrest centres in the community.

Basic Life Support

The ERC Guidelines 2025 Adult Basic Life Support (BLS) focus on the first urgent links in the Chain of Survival: early, high-quality chest compressions; effective ventilation; and prompt use of an automated external defibrillator. This applies for adults and children, as well as for out-of-hospital and in-hospital cardiac arrest.

To save a life, bystanders need to know how to recognise cardiac arrest (CHECK if unresponsive), to summon help (CALL emergency medical services at 112), to safely and effectively perform CPR (chest compressions and rescue breaths), and to use an automated external defibrillator (AED). These initial 3-C life-saving actions can be performed by anyone who comes upon a person in cardiac arrest.

Adult Advanced Life Support

Advanced Life Support (ALS) must be given quickly, either by EMS outside of hospitals or by resuscitation teams. They need to assess the situation and optimise care, make fast decisions about treatment and transport and to which facilities. To ensure a high-level of readiness and ability in these complex situations, the ERC Guidelines 2025 ALS cover a wide range of technical issues including how to best utilise defibrillators, effective advanced airway management during resuscitation, and the treatment of heart irregularities. They also recommend regular staff education and training, emphasising working together as a team.

WHAT IS CPR?

CPR stands for cardiopulmonary resuscitation, a combination of rapid and sustained chest compressions with regular rescue breaths. Pushing firmly, fast and deep on the centre of the chest in this way helps blood to continue to circulate. Spaced rescue breaths introduce oxygen for the blood to carry through the system.

"To preserve human life by making high quality resuscitation available to all"

ERC mission statement

Care After Resuscitation

(Post-resuscitation Care – a guideline by the European Resuscitation Council and the European Society of Intensive Care Medicine)

These new guidelines for healthcare professionals focus on what happens after a cardiac arrest victim has been revived. These detailed and highly technical recommendations are critical to any survivor's future health and well-being. They also offer important approaches to long-term medical care and psychological support.

Special Circumstances in Adult Resuscitation

Some situations need adapted Basic and Advance Life Saving skills. Most of these recommendations are highly technical, and intended for health-care professionals for in-hospital and out-of-hospital cardiac arrest treatment. Note that ERC Guidelines 2025 on Paediatric Life Support covers the special needs of the younger patient. Specific rescue actions to be used by the public are found in the First Aid Guidelines 2025.

Newborn Life Support

Newborn resuscitation (NLS) differs fundamentally from resuscitation in every other age group due to the transition from life inside the uterus to outside. This involves a complex set of heart, lung and metabolic changes for the newborn. Immediate intervention is crucial. (Specific guidelines for older infants and children are covered in the ERC Guidelines 2025 on Paediatric Life Support.) This section of the guidelines is highly technical and intended for specialised health care providers but also covers sensitive communication with parents at these emotionally difficult times.

Paediatric Life Support

Paediatric cardiac arrest in infants, children, or adolescents is uncommon when compared to rates among adults, and the causes often are different. In this age group, prevention is key as cardiac arrest is often a result of illness or injury. The ERC recommends that parents and caregivers of children with chronic medical conditions learn to recognise cardiac arrest warning signs and be trained in life-saving techniques specific to the needs of their child. Among teens the most likely causes of cardiac arrest are physical trauma, intoxication, and suicide attempts, which must be addressed specifically in this age group. The guidelines rely on the three Cs outlined above in basic life support (Check-Call-CPR). Note that when starting CPR, perform five rescue breaths first, which is different from when you begin CPR on adults.

Education for Resuscitation

To save as many lives as possible, bystanders need to be ready to step in to restart a heart if ever the need arises. And the only way to accomplish that is to train and prepare as many people as possible to become potential rescuers. The ERC Guidelines 2025 Education for Resuscitation emphasises the importance of members of the public throughout Europe being trained in essential First Aid techniques to save lives in the community. Course content must be tailored to audience needs and abilities and include measures to help any first-aid providers to cope with the stress, anxiety, and emotional aftermath of such an intense and unexpected event. Instruction should also include information on local “Good Samaritan” and “Duty to Rescue” laws, which vary between jurisdictions. Meeting the challenge of training future rescuers demands an inclusive approach driven by best practices geared to different audiences and abilities: people of all ages, bystanders, first responders, and healthcare professionals.

Ethics in Resuscitation

There are many ethical issues related to resuscitation. The goal of these Guidelines is to ensure that everyone involved in resuscitation is able and prepared to make proper resuscitation decisions respecting patient values and wishes. Many of these recommendations are geared towards healthcare professionals, policymakers, educators, and system administrators. Additionally, they include the importance of family members being present at critical moments; the need for patient education about advance care planning and directives; and a call for education to both the public and to healthcare professionals about the importance of registering for organ donation.

First Aid

First Aid is any initial helping response by anyone in any medical emergency in any circumstances. It is the crucial first link in every Chain of Survival. All resuscitation, including basic and advanced life support, begins the same way: recognising someone needs help and stepping up to assist; rapidly assessing the situation and calling for additional help as needed; and providing basic care based on the first aid skills you have learned. As a result, first aid training must be ready to deal with a wide range of serious conditions, from anaphylactic shock and asthma to opioid overdose, physical trauma (e.g. spinal injuries, concussions, bleeding) and "environmental emergencies" such as drowning, electric shock, hypothermia, and snake bites.

The aim of the European Resuscitation Council and the authors of this plain-language brochure is to share the most up-to-date procedures in resuscitation science. Written for the general public, we have worked to present the guidelines in simple, understandable language, while explaining how and why CPR guidelines have been updated in 2025. The goal is to ensure that everyone, from kindergarten age onwards, has the knowledge and skills to help people in life-threatening situations. Well-designed educational activities are crucial, of course, but so too are an individual's sense of personal and collective responsibility and commitment to caring for one another.

By teaching effective, up-to-date CPR techniques to people at an early age, by promoting and reinforcing best practices, and by explaining what is needed and when, we can inspire a new generation of lifesavers. ♥

Matthew Church
Writer, Cardiac Arrest Survivor

Robert (Tino) Greif
ERC Director of Guidelines and ILCOR

Message from the president of the ERC

The 2025 European Resuscitation Council (ERC) Guidelines mark an important step in our mission to improve survival from cardiac arrest and other emergencies. They result from extensive scientific review, multidisciplinary collaboration, and—significantly—the direct involvement of lay persons and survivors. Their contributions strengthen transparency, accessibility, and public trust.

This edition is broader and more inclusive than ever. Alongside rigorous science, it integrates principles of equity, ethics, and community engagement. Modern resuscitation is no longer a set of isolated interventions but part of integrated systems, responsive technologies, and collaborative communities.

From Epidemiology to Systems Saving Lives, the guidelines examine both clinical science and public health. Basic and Advanced Life Support reaffirm the importance of early intervention, while Paediatric and Newborn Life Support include the latest evidence from specialised fields. Post-Resuscitation Care highlights continuity beyond return of spontaneous circulation.

Particular attention is given to Ethics, Education, and First Aid. Education emerges as a cornerstone, emphasising systematic training, innovative teaching, and lifelong learning so that both professionals and citizens feel confident to act.

The chapter on Special Circumstances reminds us that cardiac arrest may occur in war zones, remote wilderness, or in patients with complex conditions, requiring practical and compassionate responses. Importantly, every chapter now addresses low-resource settings, reinforcing the ERC's global responsibility to make recommendations adaptable across diverse contexts.

A major innovation is the renewed Chain of Survival—both a scientific framework and a unifying global message. It highlights that survival depends on strong links between individuals, communities, and health systems.

The guidelines also embrace emerging opportunities in digital health, artificial intelligence, and wearable technologies, particularly for systems that detect, respond to, and learn from cardiac arrest events. Yet, they maintain a strong foundation: the Chain of Survival, the Formula for Survival, and the call to train, support, and protect all responders—professionals, bystanders, and families alike.

The ERC vision remains clear: a world where everyone is prepared to act in a cardiac emergency, and where systems

are built to support them. These guidelines are both roadmap and call to action for governments, institutions, clinicians, educators, and citizens.

We extend gratitude to the volunteers, experts, partner organisations, and lay contributors who shaped this edition. May this booklet inspire informed decisions, stronger systems, and ultimately save more lives.

Finally, we invite all citizens of Europe and beyond to read, embrace its messages, and join our mission: to increase survival for every victim of cardiac arrest, everywhere, every time.

Federico Semeraro
President European Resuscitation Council

Improving guideline accessibility through active community engagement

Cardiac arrest can affect anyone across a community. With appropriate support and awareness, it is possible that anyone from across that community could step-up to help. We know that the immediate response to cardiac arrest, and provision of often life-saving care, is often provided by members of the general public – and not trained healthcare professionals. Ensuring that the public know what to do is a crucial 'first link' in what is often referred to as the 'chain of survival'. The ability to deliver cardio-pulmonary resuscitation (CPR) is for all of us, and not just for healthcare professionals!

The European Resuscitation Council (ERC) 2025 Guidelines provide an important platform for synthesising and sharing advances in care. These have contributed to improved outcomes across the 'chain of survival' – from the community and emergency response to an increased focus on survivorship and recovery. We need to make it easier for people and the public to engage with, to understand, and to utilise the guidelines. We also need to be ready to respond to feedback about how we can do even better.

Enter patient and public involvement and engagement.

Working together with patients and the public as 'active partners' in the development, delivery and dissemination of research – including in guideline development and implementation - is increasingly expected across health and social care.

The ERC is at the start of this journey.

Improving accessibility to the ERC Guidelines 2025 through the co-creation of a lay summary booklet, available in multiple languages, demonstrates the community's willingness to 'think differently' on the road towards more effective, inclusive and successful guideline implementation.

Working together with people from across the wide resuscitation ecosystem – in an active, collaborative community partnership – is key. This will ensure that the voices and experiences of the community inform how care across the chain of survival continues to evolve, and hence how future guidelines are developed and implemented. Creating the right environment in which the contribution and engagement of public partners can be maximised across the chain of survival is an important next step. This requires an organisational, community, and cultural readiness. The ERC is ready. The time is now. ♥

Kirstie L Haywood
ERC Community Partnerships Taskforce Chair

Epidemiology in Resuscitation

What is Epidemiology?
Epidemiology is the study of why and how often specific diseases occur among populations. The information that is gathered underpins essential strategies to prevent and reduce illnesses and inform patient care and disease management.

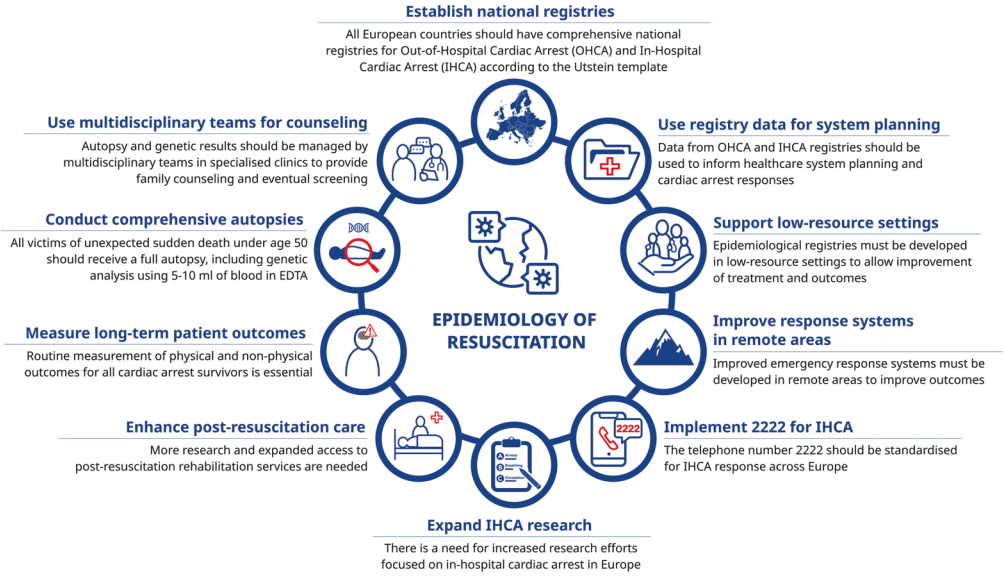
Cardiac arrest is one of the leading causes of death throughout Europe and around the world. The types and frequency of cardiac arrest as well as the likely health outcomes vary widely across Europe. To better understand why this varies, data on cardiac arrest and resuscitation from European countries is collected for research and analysis. This information reflects local, national and transnational realities and healthcare challenges, and highlights trends across the continent, identifying knowledge gaps and informing essential clinical research.

These Guidelines on epidemiology of resuscitation summarises important data about how often cardiac arrest happens who is affected, how local and national systems function, and, crucially, what happens after resuscitation is successful survived. The Guideline goes further, providing information about various common causes of cardiac arrest (including genetic factors) as well as the long-term experiences and health of survivors of cardiac arrest, their caregivers and of rescuers involved.

Why do rates of cardiac arrest vary so much from country to country? Several factors may come into play. Each nation's population differs in terms of age, overall health conditions, wealth and social structures. National emergency medical services differ and so too do protocols and policies on how to best treat cardiac arrest. Naturally, remote or inaccessible location will affect the availability of services. And finally, there are variations and small differences in the way CPR is initiated from country to country, as well as differing directives on when to stop performing CPR. The ERC provides the general framework for performing resuscitation; the local implementation depends on national legislation and specific local treatment protocols.

Recent years have seen an increase in reported out-of-hospital cardiac arrest (OHCA) cases in Europe compared to a few decades ago. Studies show that about one-third of OHCA cases in Europe are unwitnessed. Among witnessed cardiac arrests, bystanders and lay people are likely the first to respond.

KEY MESSAGES OF EPIDEMIOLOGY OF RESUSCITATION



However, the bystander rate of CPR and AED use before medical help arrives varies among European countries and is often low. To address this, there is a growing trend to "community first responders," members of the public who agree to be on call in their vicinity and are trained to initiate CPR and use an AED. A review of mobile phone systems in European countries used to alert community first responders found higher CPR and AED use compared to conventional emergency response. Deploying community first responders also improved the rate of AED use to deliver shocks before EMS arrival, especially in private homes.

Epidemiology is also concerned with health *after* cardiac arrest. These 2025 Guidelines advocate for significant improvement in how people are cared for after cardiac arrest with a focus on improving long-term quality of life. There are many potential challenges. Those who have experienced a cardiac arrest generally have similar health to the general population prior to the event. After cardiac arrest, survivors face many new challenges: cognitive impairment due to brain injury, physical limitations, psychological turmoil and mood disturbances, including anxiety, depression, and behavioural issues. Survivors and their caregivers often face these challenges without any systemic support.

The co-survivors, usually families of cardiac arrest patients, are also at risk for emotional problems of their own, like anxiety or post-traumatic stress. Witnessing a loved one's cardiac arrest is traumatic, and being called upon to deliver CPR and use an AED can be profoundly upsetting, even in those incidents when the outcomes are positive. The risk of

emotional trauma of the co-survivor complicates their capacity to be an ongoing caregiver after release from hospital. Changes in family relations are almost inevitable.

Only a few systems monitor long-term recovery, and collection of detailed information after hospital discharge is challenging. These existing follow-ups only reach survivors for 2 to 3 years after hospital discharge. As recommended in this 2025 Guideline, building and growing cardiac arrest registries to gather more and better data after cardiac arrest survival is the optimal way to ensure best care going forward.

A policy of undertaking autopsies and genetic analysis in younger victims of cardiac arrest could lead to new treatments. ♥

DATA SNAPSHOT CARDIAC ARREST IN EUROPE

- Europe's annual incidence of EMS-treated out-of-hospital cardiac arrest is 55 per 100,000 inhabitants.
- The average age of victims is 67.2 years and men account for 65% of occurrences.
- 70% of cardiac arrest occur in private locations. Roughly 10% occur in public places or in nursing homes, with fewer cases occurring in schools, sport facilities and workplaces.
- 20% of cardiac arrests that occur outside of a hospital have a "shockable rhythm" as first monitored rhythm, that is they are treatable with early use of an AED.
- Medical conditions caused more than 90% of out-of-hospital cardiac arrests, while trauma, asphyxia, drug overdose, drowning and electrocution made up the remaining cases.
- The bystander CPR rate in Europe is 58% with regional variations ranging between 13% and 82%.
- AED use by bystanders before EMS arrives on scene ranges widely from 2.6% to 59% across different European countries.
- The rate of bystander CPR and AED use is lower in settings with limited resources compared to high-resource locations.
- Nine European countries have an OHCA registry with full population coverage (lower resourced countries tend to not have them) and 17 countries have first responder systems, though some only at a local level (i.e. not coordinated nationally).
- Across Europe, survival rates following out-of-hospital cardiac arrests is 7.5%, though individual countries rates range from a low of 3.1% to an impressive 35%.
- Only one in three out-of-hospital cardiac arrest survivors is given access to rehabilitation programmes and just 10% receive brain injury rehabilitation.
- Most cardiac arrest survivors report the need for substantive support after discharge from hospital, including follow-up with access to a multi-disciplinary team.
- Researchers found genetic contributing causes to sudden cardiac arrest in up to 25% of cases in people under 50. Autopsy and genetic analysis should be routinely performed in young victims of cardiac arrest.

Systems Saving Lives

These ERC Guidelines 2025 Systems Saving Lives explains how different organisations in the community can work together to improve first response efforts for people who have had a cardiac arrest. The key to achieving success – saving more lives – lies in adopting a system-wide approach to improve the life-saving capacity of the community, in rescue organisations, and hospitals.

We read about the Chain of Survival in other sections. This section focuses on a systems approach to cardiac arrest and recommends changes to build and improve each link in the chain. This includes educating young people early in life, dispatching volunteer rescuers via mobile phone to get an automated external defibrillator (AED), enhancing emergency medical sevices (EMS) training, and creating dedicated cardiac arrest centres. The recommendations recognise and address the particular challenges of remote and low-resource settings, acknowledging the need for adaptable, practical solutions in these areas or situations.

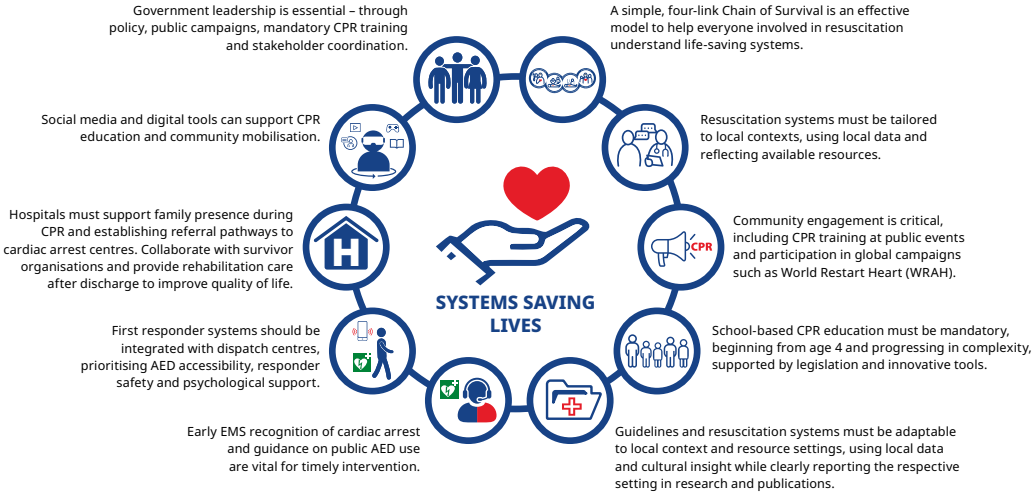
Underpinning this approach is what the experts call the "Formula of Survival," that is how combining scientific research, constant training, and system improvements result in the best possible outcomes. In addition to focusing on best evidence and practices, this approach calls for active public education, ensuring everyone knows how to perform cardiopulmonary resuscitation (CPR) and other lifesaving skills, and that they are ready to step forward to help when needed.

Here are areas the Guidelines identify as priorities.

■ **Community engagement and advocacy**

Community and workplace initiatives that encourage CPR are essential to surviving cardiac arrest. Programs such as "World Restart a Heart", "Learn to Drive – Learn CPR", and "Get Trained Save Lives" encourage bystander involvement by raising awareness, training the public, and developing effective rescue systems and policies. CPR training sessions at major sporting events and other large gatherings are also recommended. For example, the "Get Trained, Save Lives" campaign is a public health initiative collaboratively developed between the Union of European Football Associations (UEFA) and the ERC. Another successful community effort is the "Kids Save Lives" initiative, in which schoolchildren receive annual CPR training, focusing on the ERC-promoted BLS approach: Check–Call–CPR. Children can begin learning to call for help as early as age 4, progressing to training in chest compressions by ages 10 to 12, and use AEDs between

HOW SYSTEMS CAN SAVE LIVES

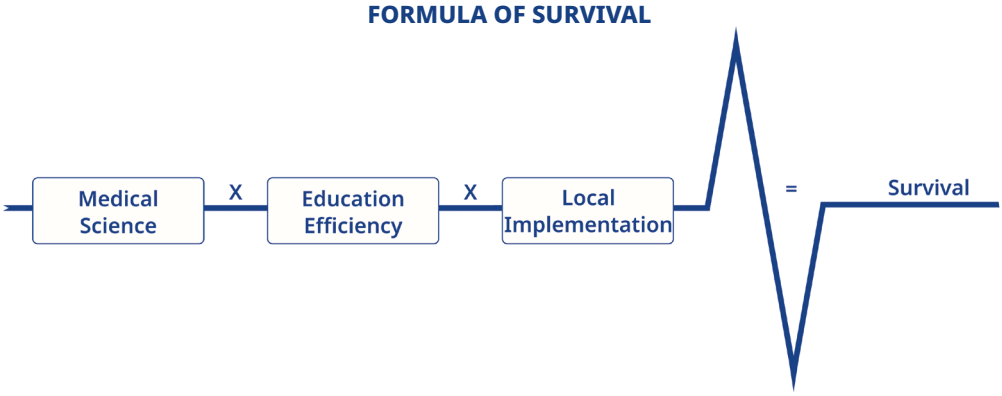


ages 13 and 16; often even earlier. What's more, children who are trained often go on to teach family members and friends. Making take-home CPR training kits available can maximise this multiplier effect. Finally, CPR training should also be extended to higher education, especially for healthcare and teaching students.

Community advocacy is crucial for strengthening emergency care systems. Some initiatives advocate for new regulations, while others focus on training hospital staff and frontline physicians locally. These programs improve emergency care for various traumas and life-threatening conditions, including cardiac arrest. Advocacy aims to bridge gaps, enhance outcomes, and make life-saving treatments more effective and accessible. Current priorities include mandating CPR training for new drivers, strengthening CPR education among young people, harmonising CPR-related legislation, improving workplace emergency preparedness, and increasing public awareness and engagement. Initiatives include the "Learn to Drive – Learn CPR" initiative, integrating basic life-saving training into driver education programs across Europe, and the Alliance for Workplace Awareness and Response to Emergencies (AWARE) seeking to enhance workplace preparedness for sudden cardiac arrest.

First response systems

Every healthcare system should introduce a system where nearby volunteers, acting as Community First Responders with basic training, can be sent by EMS to help someone having a cardiac arrest in both public places and private homes. By linking the system to AED registries as well, the dispatcher can easily identify the most accessible AED nearby.



Survivor/Co-survivor follow-up care

Healthcare systems should have clear policies supporting cardiac arrest survivors and their co-survivors, including families, friends, and partners, from their time in the hospital to long-term follow-up. These policies should be made by experts who understand the needs of both survivors and their supporters. Healthcare workers need to receive specific training to help meet these needs and provide proper care.

National Resuscitation Councils should collaborate with cardiac arrest survivor organisations to strengthen relationships between healthcare systems, survivors and their supporters. These Guidelines also recommend greater patient and public involvement and engagement, which means the public is actively involved in research planning, making healthcare guidelines, and deciding on policies. Unlike passive participation, such patient and public involvement is gaining traction in healthcare research, but its potential implementation in resuscitation research and policy is currently at a starting point and needs more development.

When resources are limited

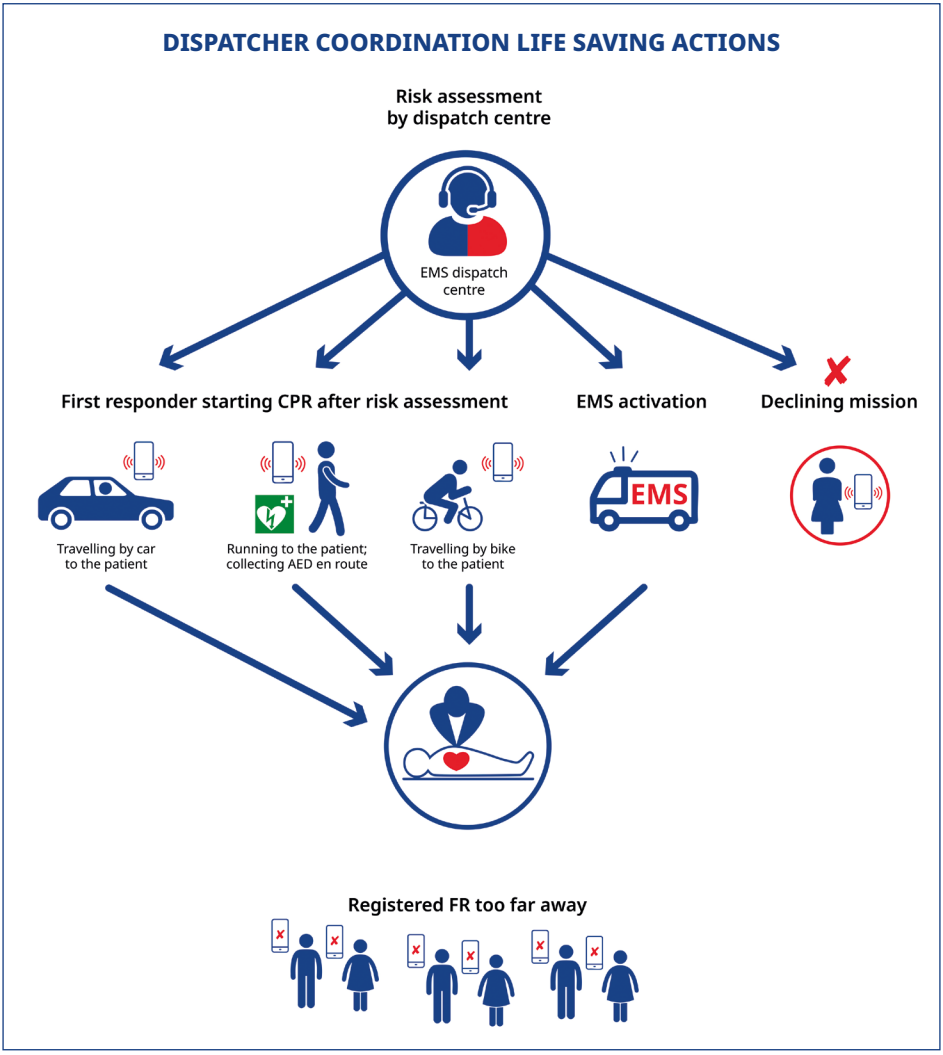
Low-resource settings, for instance due to limited finances or remote location, have specific recommendations for CPR. Often essential equipment and EMS for managing cardiac arrest are not available in these settings. Special attention should be paid to ensuring the regional and local applicability, and implementation of guidelines and recommendations.

"It takes a system to save a victim"

Mikey Eisenberg, Resuscitation 2013

Using social media

Social media platforms are powerful platform for public health interventions, and can be utilised for data collection, awareness campaigns, and CPR training. Engaging videos and interactive materials can reinforce learning and ensure content aligns with international guidelines. In adult CPR research, YouTube and X appear to be the most commonly used platforms for sharing information, followed by WhatsApp and Instagram.



EMS response

EMS should use standardised methods to quickly identify cardiac arrest, include training dispatchers to recognise cardiac arrest and guide bystanders to deliver CPR by the phone. This would include being able to direct bystanders to nearby public-access AEDs. In addition, besides that all ambulances responding to out-of-hospital cardiac arrest should be equipped with a defibrillator, others with the duty of response (e.g., police, fire departments, water rescue) should also have an AED on board.

Cardiac arrest centres

Cardiac arrest centres are specialised hospitals that provide comprehensive post-resuscitation care through multidisciplinary teams, advanced technologies and following evidence-based guidelines. These dedicated centres aim

"All citizens of the world can save a life"

Bernd W. Böttiger, Resuscitation 2018

to offer superior care and better outcomes. Recommendations include a 24/7 on-site coronary angiography lab, emergency department, rehab, education and training facilities, and, optimally, follow-up support for survivors and co-survivors.

New technologies

In recent years, digital health tools, artificial intelligence (AI), and advanced sensor-based monitoring systems have reshaped how cardiac arrest can be identified and managed. Wearable health devices, contactless monitoring solutions, and mobile apps are revolutionising cardiac arrest detection and response. While traditional resuscitation has typically relied on bystanders and EMS acting quickly, these technologies enable early detection, autonomous alerts, which might lead to better survival rates. Artificial intelligence (AI) might enhance early detection, risk assessment, and outcome forecasting, but future research is needed to see what really improves survival after cardiac arrest.

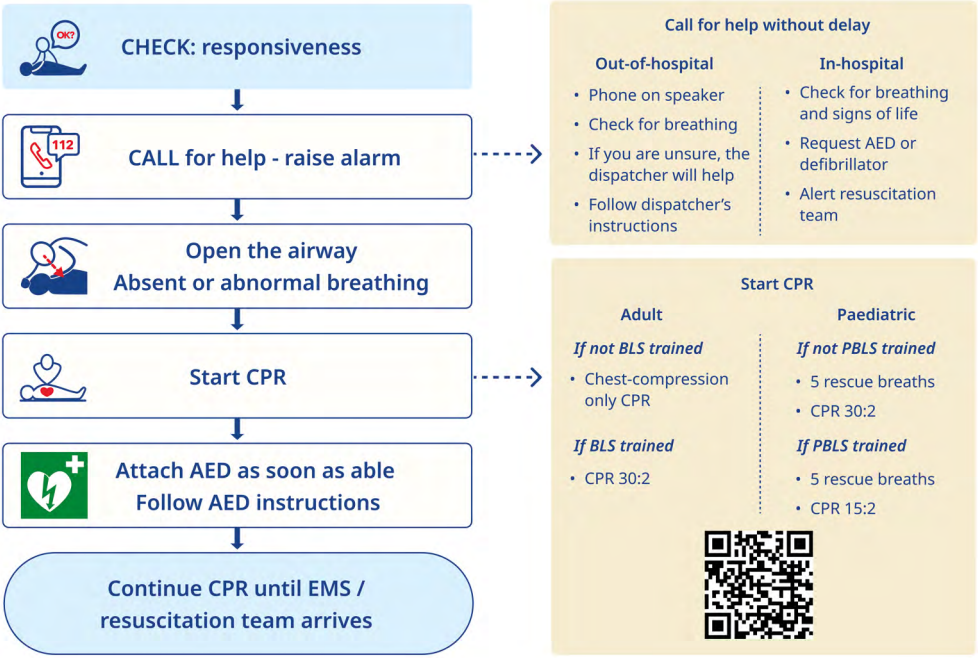
WORLD RESTART A HEART CAMPAIGNS

Following an ERC campaign in 2024, the European Parliament issued a call for improved CPR and AED training across all EU member states. It proposed establishing a European Cardiac Arrest Awareness Week, recognising that national resuscitation policies can increase community members' willingness to perform bystander CPR. The goal is to train as many people as possible, raise public awareness of the importance of bystander CPR and AEDs, establish protective legislation for lay rescuers, and develop innovative systems and policies to further improve survival outcomes. To promote these policies, the ERC established European Restart a Heart Day on October 16 to raise awareness from 2013. This initiative later evolved into worldwide movement "All people of the world can save a life—all that is needed is two hands (Check, Call, Compress)." Between 2018 and 2023 in the "World Restart A Heart" (WRAH) campaign, more than 12 million people were trained, and 570.7 million individuals were reached through campaign messages tailored to each country's specific context and culture.

Adult Basic Life Support

The European Resuscitation Council Guidelines 2025 Adult Basic Life Support (BLS) focus on the first urgent links in the "Chain of Survival": early, high-quality chest compressions; effective ventilation; and prompt use of an automated external defibrillator.

UNIVERSAL BLS ALGORITHM

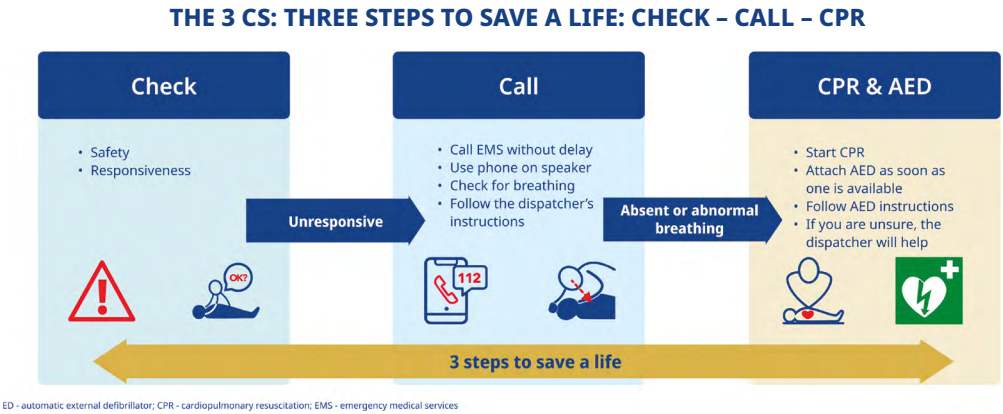


These initial life-saving actions can be performed by anyone who comes upon a person in cardiac arrest. Without intervention, survival is impossible. According to numerous studies cited in the ERC Guidelines 2025, when bystanders step in to help, about 15% of people in cardiac arrest survive.

To save a life, bystanders need to know how to recognise cardiac arrest, to summon help, and to safely and effectively perform cardiopulmonary resuscitation (CPR). In some situations, when possible, they may be called upon to use an automated external defibrillator (also called AED).

1. CHECK: Recognise cardiac arrest

The signs of a person in cardiac arrest are basic: the victim is unresponsive and not breathing *normally*. There may be sei-



ED - automatic external defibrillator; CPR - cardiopulmonary resuscitation; EMS - emergency medical services

zure-like movement initially. The situation requires fast action.

What does "breathing normally" mean? What is "agonal breathing"?

One of the biggest barriers to a bystander stepping in to help is when the victim seems to be breathing. They appear to be gasping, moaning, sighing, gurgling, groaning, snorting, or struggling to breathe. This is not breathing! It is involuntary puffing, air escaping. It happens in the early stages of many cardiac arrests. This is "agonal breathing," and it is often mistaken for a sign of life. Rescuers need to recognise that it is not breathing and immediately call for help and begin CPR.

Cardiac arrest victims who were in the middle of vigorous exercise or play, where cardiac arrests can happen, may appear to be breathing heavily, and their eyes are often open. Nonetheless, they are in cardiac arrest and require CPR immediately.

Do not confuse cardiac arrest with seizure! Brief, seizure-like movements are often seen in younger cardiac arrest victims and can make recognition of cardiac arrest difficult. Once the movement stops, assess breathing immediately.

2. CALL (in Europe 112, or your local emergency service number): Emergency help on the line

Cardiac arrests are not always recognised by bystanders on scene. In fact, most often, it is the emergency medical service (EMS) operator on the phone who does. These emergency dispatchers are trained to help bystanders be rescuers.

The dispatcher may start by asking: "Is the person conscious?" "Are they breath-

CHECK if responding

ing normally?" They will guide the untrained rescuer in assessing the situation and prepare to begin CPR. They will be able to assist other bystanders in locating, retrieving and setting up an AED. As they do all this, they are at the same time dispatching EMS to the scene.

That is why you need to call quickly immediately, then turn on the speaker on your phone to allow communication with the dispatcher while your hands are free to attend to the victim. Dispatchers will deliver clear step-by-step instructions over the phone, while calming and supporting the bystander at the scene.

3. CPR – Chest compressions

The ERC Guidelines emphasise the importance of quickly beginning and maintaining chest compressions to increase the chances of survival. Avoid delay and unnecessary pauses. While it is necessary to interrupt compressions to do "rescue breaths" or perform defibrillation, continuous chest compressions should always be the rescuers' priority.

The dispatcher is also key to helping bystanders deliver CPR promptly and effectively. The ERC 2025 BLS Guidelines recommend that dispatchers offer CPR instructions for all out-of-hospital interventions: The survival rates and health outcomes are much better when they do.

Effectiveness depends on hand position, depth of chest compressions, and the rate at which they are done. The ERC Guidelines are clear that the most effective rate is 100 to 120 chest compressions per minute. Equally important to effective compressions is the force or depth of each push: each compression must push the chest down 5 to 6 cm. The hands should be positioned on the centre of the chest.

Chest compressions are best delivered on a firm surface. Softer places (like a mattress) will reduce the depth and the effect of each compression. When unavoidable, increase overall compression strength to compensate for the soft surface.

Call for help if not responding

If not breathing normally - start chest compressions

"Standard cardiopulmonary resuscitation (CPR) is still the "gold standard"

Gavin D. Perkins, 2021

3. CPR - Rescue breaths

Doing rescue breaths (ventilating the lungs) during CPR is a critical way to improve the victim's chances of survival by delivering oxygen to the brain. Still, it is important to minimise the time to deliver rescue breaths to avoid disrupting regular chest compressions.

When bystanders are able and willing to provide rescue breaths, the recommendation is that they should performing CPR at a rate of 30 compressions followed by 2 breaths, repeated until EMS are on scene and able to take over. This will ensure the best chance for a positive outcome with intact brain function.

Each breath should be just strong enough to cause the chest to rise visibly for about one second. Avoid being too forceful. The breaths can be performed mouth-to-mouth as needed. If the rescuer is unable to make the chest rise with ventilation, quickly check for airway blockage.

Ventilation of a cardiac arrest victim is preferred as mouth-to-mouth ventilation. However doing that on a stranger in cardiac arrest is for some not comfortable. Recognising this very human reaction, the Guidelines recommend that in such a case, giving chest compressions alone at a rate of at least 100 per minute is an acceptable approach to offer the victim the best chance of survival.

AED: Automated External Defibrillators

An automated external defibrillator (AED) is a portable, battery-powered device that uses an electric shock to restart a heart in cardiac arrest. Increasingly, they are being located in the community for quick access by members of the public.

AEDs make it possible for bystanders to attempt defibrillation well before EMS arrives. That can save lives. The probability of survival from out-of-hospital cardiac arrest is significantly increased if patients receive early CPR and shocks from an AED. Each minute of delay in getting to defibrillation reduces the probability of survival by 10%.

The placement, accessibility and ease of retrieval of AEDs are central to the best outcomes after cardiac arrest. This is why the ERC 2025 Guidelines recommend the implementation of public access programmes for defibrillators and recommend that public-access AEDs need to be easily accessible, well-marked and kept in unlocked cabinets that are accessible 24 hours a day, 7 days a week. Research shows that theft or vandalism are not major concerns. The ERC also notes the increasing use of GPS-enabled smartphone apps which can identify AEDs near their location and provide directions to them.

■ What an AED does

Each AED is equipped with pads that attach to a patient's bare chest. When connected, the machine will first determine if it is a "shockable rhythm." (Certain types of cardiac arrest respond to electric defibrillation; others do not.) The rescuer cannot deliver a shock in error: the AED will not discharge if it does not detect appropriate conditions. When called for, the

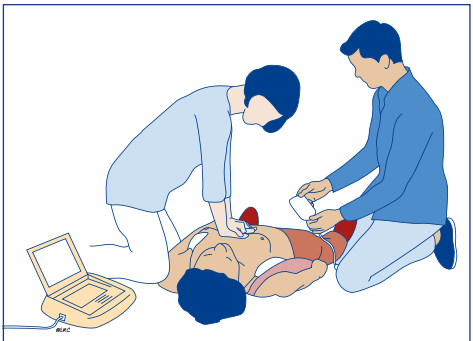
AED will prompt and direct if and when to deliver an electric shock to re-establish normal heart rhythm.

How to use an AED

In cardiac arrest, when multiple bystanders are available to help, send someone to quickly retrieve the nearest AED. Do not stop doing CPR until the AED is attached to the victim and indicates it is ready to start.

Upon retrieval, turn the AED on and follow the voice prompts on where to place the pads. Generally, one defibrillation pad should be positioned below the right collarbone, next to the breastbone, with the other pad on the left side under the armpit. Avoid placing pads directly on breast tissue. It is important to ensure that any part of a bra is not in the way; it should be moved out of the way before applying the pad.

With pads in place, the AED will analyse the victim's heart rhythm to determine if a shock is called for. If it is, the AED will prompt the rescuer to proceed. After the shock if unsuccessful, immediately continue with chest compressions.



Use an AED as soon as possible

Continue CPR immediately after the shock

Due to the powerful impact AEDs have on survival rates among out-of-hospital cardiac arrest victims, the ERC calls for AEDs to be registered with local emergency services so dispatchers can quickly send bystanders to the nearest available AED. The ERC also notes that AED cabinets must be unlocked to be easily accessible.

While further study is required, the ERC notes the potential for small airborne drones to rapidly deliver AEDs to rural areas and other locations where ambulances would be slow to arrive. However, with only limited real-world testing, it is still too early to tell if drone delivery actually improves survival rates.

BASIC LIFE SUPPORT
STEP-BY-STEP

SEQUENCE / ACTION	TECHNICAL DESCRIPTION
SAFETY 	• Make sure that you, the victim and bystanders are safe
RESPONSE Check for a response 	• Shake the victim gently by the shoulders and ask loudly: ***"Are you all right?"***
ALERT EMERGENCY SERVICES 	• If victim is unresponsive, ask a helper to call the emergency medical services or call them yourself • Stay with the victim if possible • Activate the speaker function or hands-free option on the telephone so that you can start CPR whilst talking to the dispatcher
AIRWAY Open the airway 	• If there is no response, position the victim on their back • With your hand on the forehead and your fingertips under the point of the chin, gently tilt the victim's head backwards, lifting the chin to open the airway
BREATHING Look, listen and feel for breathing 	• Look, listen and feel for breathing for no more than 10 seconds • A victim who is barely breathing, or taking infrequent, slow and noisy gasps, is not breathing normally
SEND FOR AED Send someone to get an AED 	• Send someone to find and bring back an AED, if available • If you are on your own, fetch an AED only if you can get and apply it within one minute; otherwise, start CPR immediately
CIRCULATION Start chest compressions 	• Kneel by the side of the victim • Place the heel of one hand in the centre of the victim's chest - this is the lower half of the victim's breastbone (sternum) • Place the heel of your other hand on top of the first hand and interlock your fingers • Keep your arms straight • Position yourself vertically above the victim's chest and press down on the sternum at least 5 cm (but not more than 6 cm) • After each compression, release all the pressure on the chest without losing contact between your hand and the chest • Repeat at a rate of 100-120 min^{-1}
COMPRESSION-ONLY CPR 	• **If you are untrained, or unable to give rescue breaths,** give chest-compression-only CPR (continuous compressions at a rate of 100-120 min^{-1})

COMBINE RESCUE BREATHING WITH CHEST COMPRESSIONS 	• **If you are trained to do so**, after 30 compressions, open the airway again, using head tilt and chin lift • Pinch the soft part of the nose closed, using your index finger and thumb of your hand on the forehead • Allow the victim's mouth to open, but maintain chin lift • Take a normal breath and place your lips around the victim's mouth, making sure that you have an airtight seal • Blow steadily into the mouth whilst watching for the chest to rise, taking about 1 second as in normal breathing. This is an effective rescue breath • Maintaining head tilt and chin lift, take your mouth away from the victim and watch for the chest to fall as air comes out • Take another normal breath and blow into the victim's mouth once more to achieve a total of two rescue breaths • Do not interrupt compressions by more than 10 seconds to deliver the two breaths, even if one or both are not effective • Then return your hands without delay to the correct position on the sternum and give a further 30 chest compressions • Continue with chest compressions and rescue breaths in a 30:2 ratio
WHEN AED ARRIVES Switch on the AED and attach the electrode pads 	• As soon as the AED arrives, switch it on and attach the electrode pads to the victim's bare chest • If more than one rescuer is present, CPR should be continued whilst the electrode pads are being attached to the chest
FOLLOW THE SPOKEN/ VISUAL DIRECTIONS	• Follow the spoken and visual directions given by the AED • **If a shock is advised**, ensure that neither you nor anyone else is touching the victim • Push the shock button as directed • Then **immediately** resume CPR as directed by the AED
IF NO SHOCK IS ADVISED Continue CPR 	• **If no shock is advised,** immediately resume CPR and continue as directed by the AED

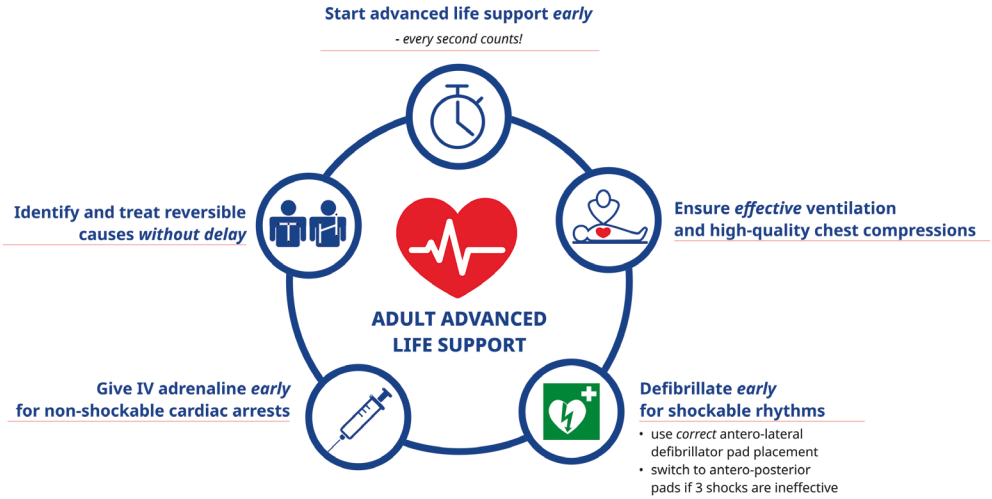
IF NO AED IS AVAILABLE Continue CPR 	• If no AED is available, **or** whilst waiting for one to arrive, continue CPR
	• Do not interrupt resuscitation until:
	  • A healthcare professional tells you to stop OR
	  • The victim is definitely waking up, moving, opening eyes, and breathing normally OR
	  • You become exhausted
	• It is rare for CPR alone to restart the heart. Unless you are certain that the victim has recovered, continue CPR
	• Signs that the victim has recovered
	  • Waking-up
	  • Moving
	  • Opening eyes
	  • Breathing normally

Adult Advanced Life Support

These guidelines for health care professionals describe Advanced Life Support (ALS) for adults with cardiac arrest inside or outside the hospital. They build on the Basic Life Support treatments that can be started by anyone (chest compressions, rescue breaths and using an automated external defibrillator). The Advanced Life Support Guidelines emphasise the importance of providing *early* and *effective* advanced interventions to improve survival from cardiac arrest wherever it happens.

Rapid delivery of advanced life saving techniques is essential for them to be effective. Emergency Medical Services (EMS) must be optimised for a fast response, with emergency personnel on scene able to quickly assess the situation and take over care of the victim. These rescuers will need to make decisions about treatment and to which hospital the patient will be transported. In some situations, the medical personnel will also have to determine, after consulting with the family, when and if it is best to stop resuscitation efforts when there is no hope of success. To ensure a high-level of readiness and competence in these

KEY MESSAGES IN ADULT ADVANCED LIFE SUPPORT



complex situations, the Guidelines call for routine staff education, and training for rescuers involved in advanced life support.

Geared to medical and rescue professionals, the ALS Guideline topics cover a wide range of interventions. The topics include how to prevent cardiac arrest in hospital and the community. Further content focusses on the use of automated and manual defibrillators, advanced airway management during resuscitation, and the treatment of heart irregularities both before and after cardiac arrest.

"Resuscitation must be applied with judgement and compassion"

Peter Safar, Resuscitation 1996

These Guidelines also note that not all communities have equal access to advanced emergency care. This may be the result of factors such as poverty, poor educational levels, limited resources, small population, or geographic remoteness. These Guidelines specify that in these circumstances, Advanced Life Support may need to be adapted, with a greater focus on prevention, early First Aid and Basic Life Support. If needed special tailored Advanced Life Support strategies should be added depending on the situation.

In addition, these Guidelines also focus on the need for prevention efforts. Cardiac arrest is the third leading cause of death across Europe, and survival rates sit at 10% or less after an out-of-hospital cardiac arrest. In older people, coronary heart disease is the leading cause; while in younger people, hereditary heart conditions and substance misuse are more common. This underscores the importance of cardiac arrest prevention. Predicting cardiac arrest in the community is challenging because most underlying conditions are undiagnosed. For this reason, these Guidelines recommend public education to help reduce cardiovascular disease to begin with, combined with teaching the public to recognise the very early signs or symptoms of cardiac problems, irrespective of age or background, and to seek medical help.

These Advanced Life Support Guidelines will be used by EMS and hospital settings throughout Europe to treat cardiac arrest in adults and help increase the number of people surviving after cardiac arrest. ♥

Paediatric Life Support

This ERC guideline is about treating cardiac arrest in young people, from birth to age 18, and covers a wide range of topics from preventing cardiac arrest to basic and advanced life support, special situations and an increased emphasis on post-resuscitation and post-discharge care. This summary focuses on recommendations geared to parents, caregivers and the general public.

Paediatric patients are defined as children from birth to age 18.

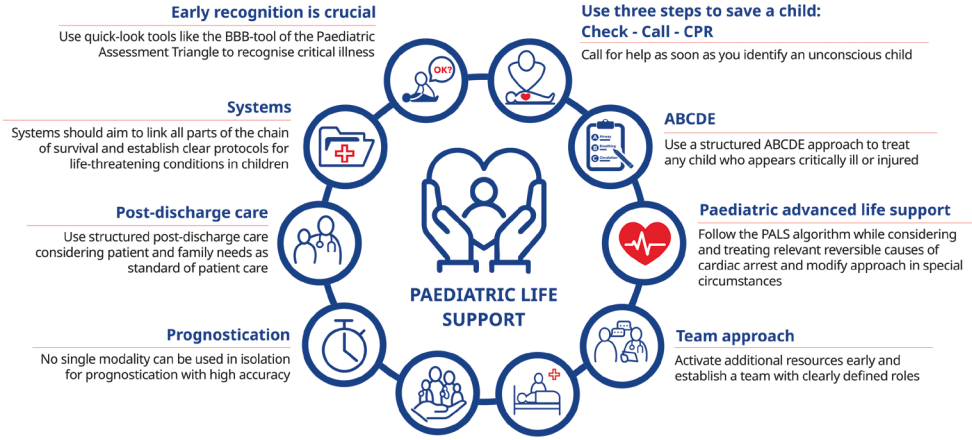
"Infant" means a baby that went home from hospital after birth or a child up to 1 year old.
"Child" means a child aged 1 to 12 years.
"Adolescent" means someone between 13 and 18 years. Since it is often hard to distinguish an adolescent and an adult, when in doubt, use directions for adults.

Please see separate chapter on resuscitation for newborns directly after birth.

Cardiac arrest in children

Paediatric cardiac arrest is uncommon when compared to rates among adults, and the causes often are different. The impacts of negative outcomes too can be different, with devastating lifelong consequences for the child, their family, and

KEY MESSAGES IN PAEDIATRIC LIFE SUPPORT



ABCDE - airway, breathing, circulation, disability, exposure; BBB - behaviour, breathing, body colour; CPR - cardiopulmonary resuscitation; PALS - paediatric advanced life support; ROSC - return of spontaneous circulation

automatic external defibrillator; CPR - cardiopulmonary resuscitation; EMS - emergency medical services

society. These include impaired abilities, limited participation in school, work and community, diminished quality of life, and the burden of significant healthcare costs. Research shows that children from an ethnic minority background, from marginalised communities, and those from lower socioeconomic environments are more likely to be affected by cardiac arrest.

Prevention is key

Cardiac arrest in infants, children, and adolescents often occurs as a result of illness or injury. These can trigger respiratory, circulatory, or neurological failures that lead to cardiac arrest. For this reason, prevention is a key strategy in tackling cardiac arrest in children.

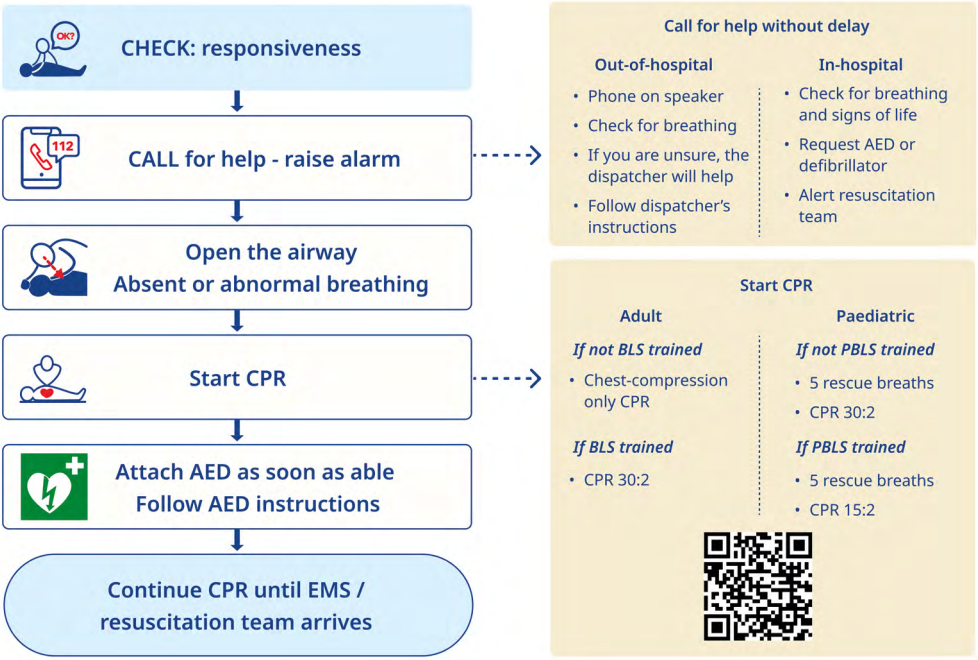
Identifying children with serious illnesses at risk of a cardiac arrest is not easy, especially for people who aren't trained rescuers. The ERC recommends that the parents and daily caregivers of children with chronic medical conditions, chronic illnesses, and those dependent on medical technology should be trained to recognise cardiac arrest warning signs and be trained in life-saving techniques specific to the needs of their child.

The ERC also recommends that child-oriented lifesaving training be provided to anyone working directly with kids, like child minders, schoolteachers, first responders, lifeguards, and youth coaches/trainers. Facilities in areas where there is an increased risk of cardiac arrest, such as arenas, playing fields, pools and open water, must have equipment, plans and trained personnel ready.

The ERC 2025 guidelines for caregivers and untrained rescuers rely on quick-look assessments of breathing, behaviour and colour of the body. Some of these protocols may be overly cautious but they are warranted because the risks and effects of cardiac arrest in children are so high.

Cardiac arrest causes are different for adolescents. Among teens the most likely causes of cardiac arrest are physical trauma, intoxication, and suicide attempts. Essential strategies to prevent cardiac arrest in this age group therefore must include working to address teen violence and drug abuse and reduce traffic accidents. The ERC also recommends increased and improved mental health resources focused on this group.

THE ERC BASIC LIFE SUPPORT ALGORITHM



Three Cs: Check – Call – CPR.

In emergencies, prompt action is crucial. The ERC's 2025 guidelines offer "quick-look" methods for caregivers and rescuers to rapidly assess young victims and begin aid. These easy-to-remember steps—quick recognition, calling for help, and starting compressions are key to any successful rescue.

1. CHECK: Recognize cardiac arrest

The key to fast action is rapid assessment. The ERC recommends the "BBB triage tool" (check Behaviour, Breathing, and Body colour) to quickly look at key indicators. If any are present, immediately call for help.

Behaviour: How are they acting? Do they react to voice or non-painful touch stimulation? Are they not fully conscious, or difficult to rouse? Do they seem confused or agitated? Is their body floppy or rigid? Unable to move one or more limbs? Are they crying inconsolably?

Breathing: Are they struggling to breathe, unable to take a deep breath, making additional noises while breathing. Are they breathing too fast, too slow or irregularly? Are they unable to speak (children and adolescents) or cry aloud (infants or smaller children)?

Body colour: Is their skin mottled, blue, greyish or abnormally pale? In children with darker skin tones check hand palms, and soles of the feet for discoloration.

2. CALL (in Europe 112, or your local emergency number): Emergency help on the line

Act fast. It is important to quickly get trained medical help when a child is showing any of these indicators. Have someone nearby immediately call EMS (112 or local emergency number). If you are alone, make the call, put in speaker mode and place the phone near to you.

Dispatchers are trained to guide rescuers through CPR. As with adults, treating children by performing chest compressions in combination with rescue breathing has the greatest likelihood of success. Still few bystanders will have been trained to perform paediatric CPR. For this reason, the dispatcher's help is essential.

3. CPR: Compressions and rescue breaths

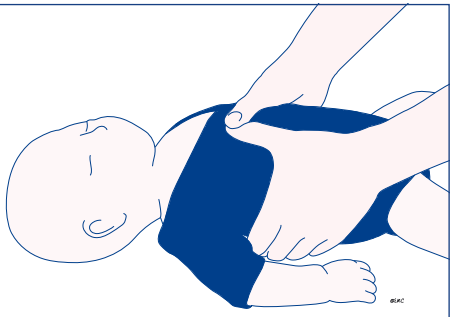
CPR stands for cardiopulmonary resuscitation, a combination of rapid and sustained chest compressions with regular rescue breaths. Pushing firmly on the chest in this way helps blood to continue to circulate. Spaced rescue breaths introduce oxygen for the blood to carry through the system. The system for children is similar to that used for adults, with some important differences.

The key is to start CPR immediately, following the instructions of the dispatcher. Whenever possible chest compressions should be performed on a firm surface (provided this does not delay starting).

When rescuing a child, the operator will direct the rescuer to start by immediately performing five rescue breaths. (This is different from CPR on adults.) The untrained rescuer should then begin performing CPR with a ratio of 30 compressions to two rescue breaths. For younger, smaller victims, the dispatcher will offer instructions for specific CPR techniques with the thumbs. Compressions should occur on the lower half of the bony plate to which the ribs connect at the centre of the chest, the sternum.

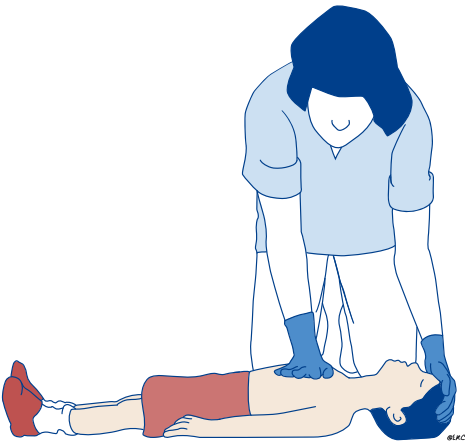
■ How to perform CPR by age of victim

Infant Baby or a child up to 1 year: The ERC recommends the two-thumb encircling technique for performing chest compressions on infants because it is very effective, straightforward to do and is easily described over the phone by a dispatcher to an untrained rescuer.

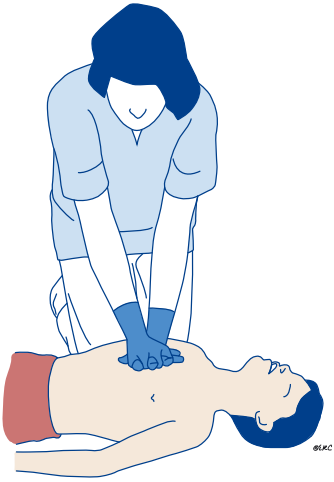


two-thumb encircling technique

Child 1-12 years of age: The ERC recommends one- or two-handed compressions, depending on body size. When possible, use of the two-hand technique leads to more efficient compressions and less rescuer fatigue.



one-hand technique



two-hands technique

<u>Adolescents</u> 13 – 18 years of age: Since it is often hard to distinguish an adolescent and an adult, when in doubt, use always the two-hand technique as recommended for adults (BLS).

Do not stop until relief arrives - The ERC notes that with children it is very often a primary caregiver who is the rescuer, and they will not hesitate to perform rescue breaths as well. If the rescuer is hesitant, the dispatcher will guide them in the chest-compression-only technique.

"Children are not just little adults"

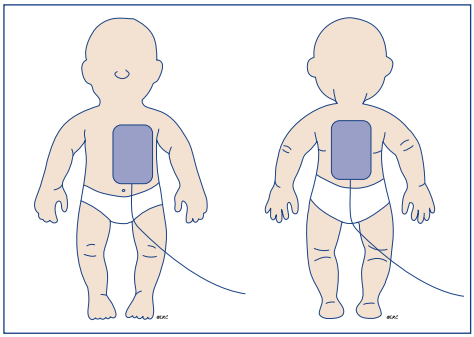
Vinay Nadkarni, Resuscitation 2004

Using an Automated External Defibrillator (AED) with Children:

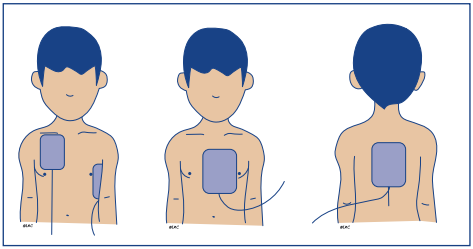
There are special considerations when using an AED on a young victim.

- Follow the instructions of the AED.
- Apply the pads with minimal interruptions to CPR (if possible, one person applies the pads as a second continues performing CPR).
- All infants and children weighing less than 25 kg (i.e. approximately 8 years of age) activate "paediatric mode" on the AED, if available. For larger children and adolescents, use the AED in standard adult mode. If the AED does not have instructions for children, use it in standard adult mode.

- Place pads as follows:
  - For infants and children weighing less than 25 kg place one pad mid-chest on the child's front, left of centre. Place the second on the back between the shoulder blades.



  - In children weighing more than 25 kg and adolescents, apply pads as above or one defibrillation pad should be positioned below the right collarbone, next to the breastbone, with the other pad on the left side under the armpit. Avoid placing pads directly on breast tissue. The front and back positioning can be used in case the pads are too big to be positioned front-side on the child chest.



The AED will then analyse the victim's heart rhythm. If it determines a shock is called for, the AED will prompt the rescuer to proceed by pressing the start button.

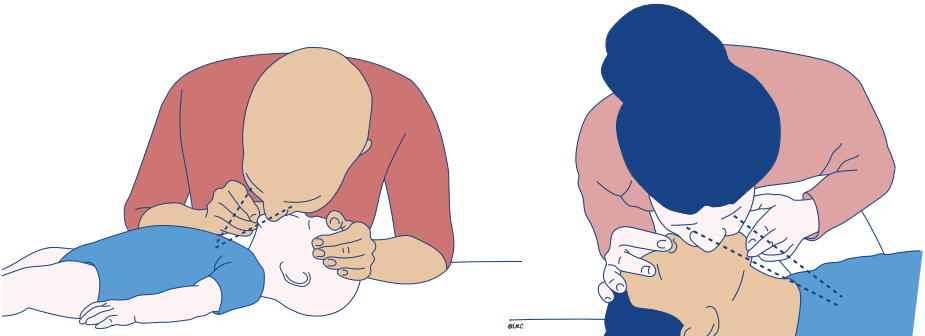
- Do not touch the patient while the AED is analysing the rhythm.
- Restart chest compressions immediately after shock delivery.

ERC Recommendations for care after resuscitation and after discharge from hospitals

After a child's cardiac arrest, families can face grief, trauma, uncertainty and change. It may take days before physicians can say more about the outlook on recovery after the cardiac arrest. To support them and ensure the best outcomes, the ERC recommends family-centred care of teams of specialists (neurologists, psychologists, social workers, child-life specialists, and interpreters), as required, who are accessible and who communicate with them clearly and honestly to address the child's and family's needs. These resources are a crucial part of managing the early days after resuscitation. Parents can ask any questions at any time and are encouraged to seek support for themselves if needed. A wide range of emotions is normal, both right away and later on.

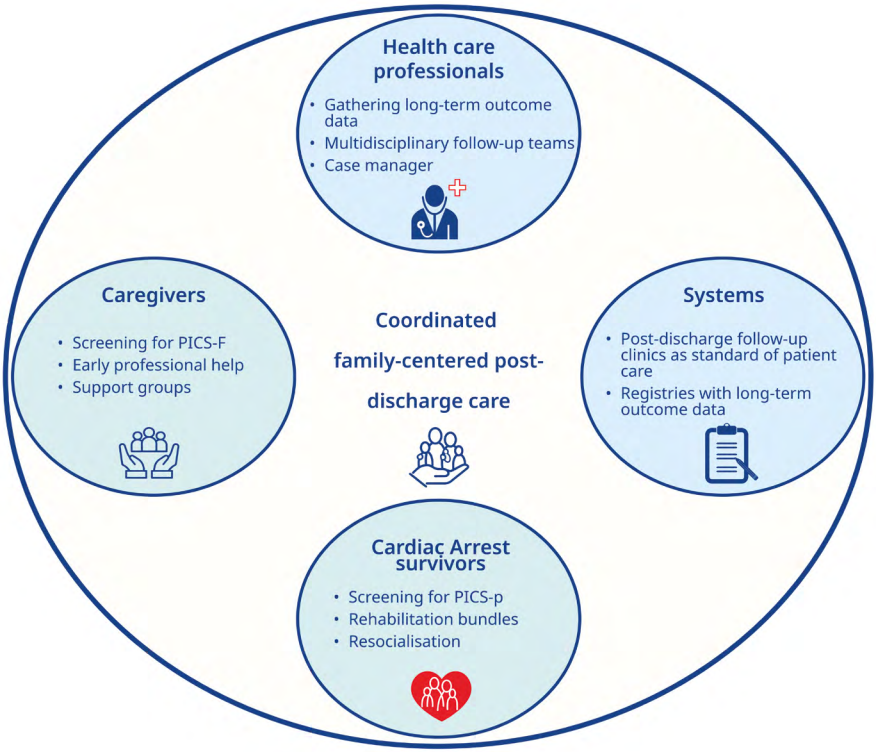
The challenges don't end there.

With discharge from hospital, many more challenges might come: long-term complications of paediatric cardiac arrest survivors are a major concern. Early follow-up after leaving hospital is crucial to survivors and their caregivers so the ERC and its community advisors recommend early rehabilitation and post-discharge care should be a standard for all survivors and their families. They also recommend support and care for families of victims who did not survive, including bereavement and other psychological counselling. ♥



Try to apply rescue breathing in an infant with the mouth-to-mouth-and-nose technique. In larger children, use the mouth-to-mouth technique. Observe the chest rising.

POST-DISCHARGE CARE

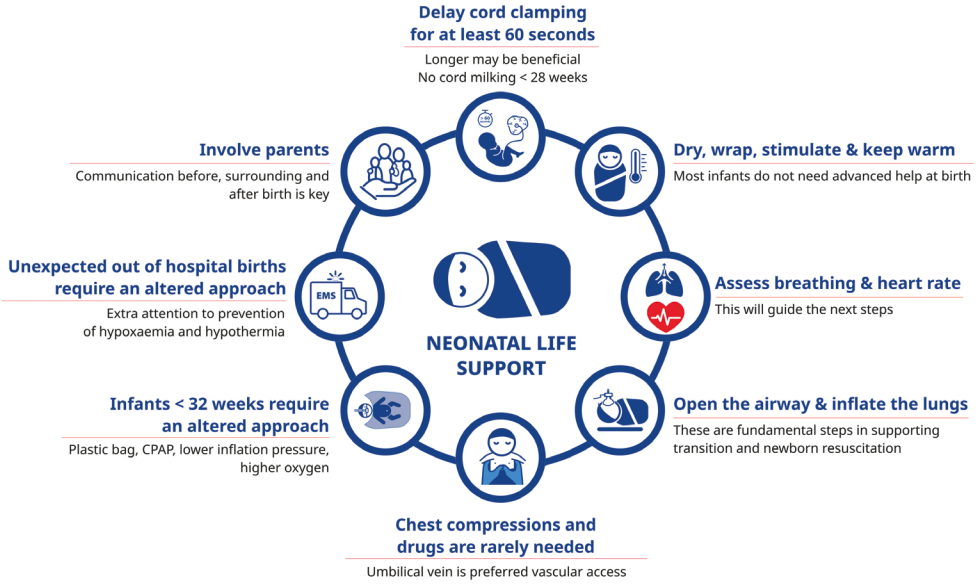


PICS-F - post-intensive care syndrome family, PICS-p - post-intensive care syndrome paediatrics

Newborn resuscitation and support of transition of infants at birth

This ERC Guideline on Newborn Life Support presents a systematic approach to resuscitation and support of transition from life inside the womb to life outside the womb for both premature and term babies. The life support guidelines for older infants and children are covered in the ERC Guidelines 2025 on Paediatric Life Support.

KEY MESSAGES IN NEONATAL LIFE SUPPORT



CPAP - continuous positive airway pressure

Every newborn baby must adjust from life in the womb to life outside. This moment involves a lot of changes to the heart and lungs. Most babies can do this naturally, but some need help to start breathing or keep their heart working well. The ERC has created these Guidelines to support all healthcare professionals and teams (like midwives, nurses, paramedics, obstetricians, paediatricians, trainees or specialists) who might need to be at birth, with the aim of providing the best possible care at this critical moment.

These recommendations cover how to prepare for the birth, keep newborns warm, support breathing and blood flow, and decide when to get more specialised treatments. These Guidelines also show how important it is to train teams and get them working together. It also highlights how important it is to tallk clearly and effectively with parents at these emotionally difficult times.

Sometimes, difficult decisions sometimes need to be made about whether to give treatment that keeps a baby alive, especially for very premature or seriously ill babies. These Guidelines say that such choices should be made with parents, with compassion, and with the baby's comfort and dignity in mind. ♥

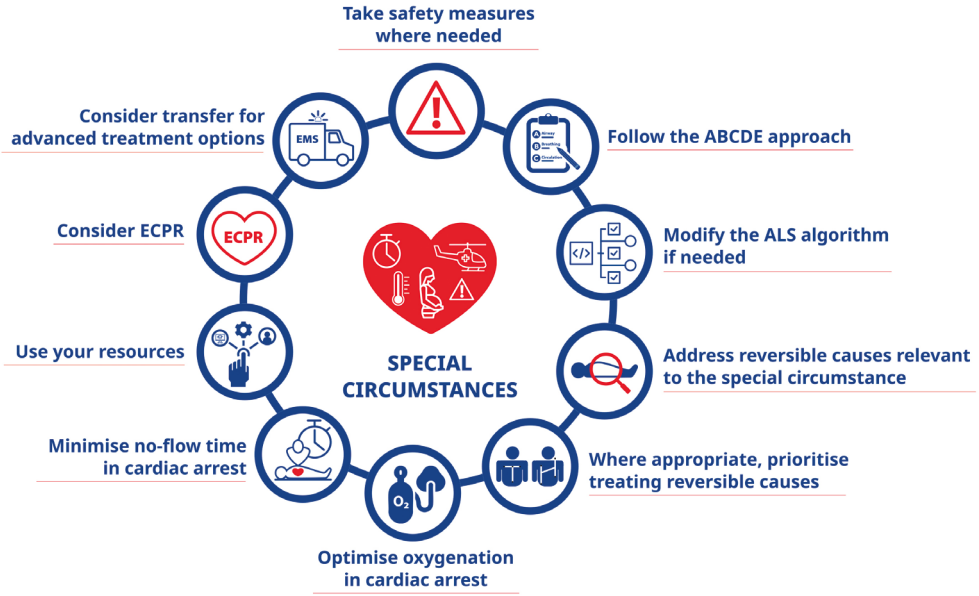
"The golden minute after birth in newborn care is analogous to the golden hour after trauma in emergency medicine. The 1st minute after birth provides a critical window period for interventions with impact on immediate and long-term survival of the newborn."

Helping Babies Breath (HBB) Program
www.aap.org

Special Circumstances in Resuscitation

Cardiac arrest, no matter what the cause, requires immediate action. That means quickly recognising the problem, calling for help right away, doing high-quality chest compressions and rescue breaths. It also requires trained health care professionals to find and fix reversible causes. Still, it is important to remember that not all rescue scenarios follow a predictable pattern; such special situations need different approaches, which are covered in these guidelines.

KEY MESSAGES IN SPECIAL CIRCUMSTANCES IN ADULT RESUSCITATION



ABCDE - airway, breathing, circulation, disability, exposure; ALS - advanced life support; ECPR - extracorporeal cardiopulmonary resuscitation

"If cardiac arrest does occur, high quality CPR with minimal interruption and treatment of reversible causes are still the most important interventions. Resuscitation needs to be modified in specific circumstances and may require specialist interventions."

Charles D. Deakin, Resuscitation 2021

These guidelines focus on essential adaptations to basic and advanced life-saving skills when needed in special or unusual situations for adults. Most of the recommendations are highly technical and manly meant for healthcare professionals who treat cardiac arrest both in-hospital and out-of-hospital. Note that ERC Guidelines 2025 on Paediatric Life Support covers the special needs of the younger patient.

Circumstances requiring specialised care include treating victims of drowning or avalanche, hypothermia, opioid overdose and traumatic injury. There are also locations which may require specific action by bystanders, including aboard aircraft and ships. A third type of special situation involves patients with pre-existing conditions which may have caused the cardiac arrest or complicate its rapid treatment.

Effective management of these special circumstances in cardiac arrest involves the prompt identification and treatment of reversible causes, often referred to as the 4Hs and 4T. These Hs stand for hypoxia (lack of oxygen), hypovolemia (low blood volume), hypo-/hyperkalaemia (electrolyte disorders), hypo-/hyperthermia (temperature disorders) and the Ts for toxins, tamponade (blood around the heart), tension pneumothorax (air between the lung and the chest wall), thrombosis (blood clot in the lung or heart). For this reason, standard life support protocols must be adapted to deal with these special circumstances in cardiac arrest. The ERC Guidelines 2025 categorise these special circumstances into three parts:

1. Special causes leading to specific interventions, covering:
Allergic shock, severe electrolyte disorders, severe temperature disorders (cold and heat shock), avalanche rescue, blood clots in the heart or lungs, intoxications, cardiac arrest from injury or trauma.

2. Special settings where unique site factors require tailored approaches:
During interventions or surgery on the heart, during operations, after drowning, during sport, aboard aircraft and ships.

3. Special patient populations that require different modified treatment strategies.
Asthma, dialysis (renal replacement therapy), severely overweight people, pregnant women.

Remember: The essentials of basic life-saving always apply. ♥

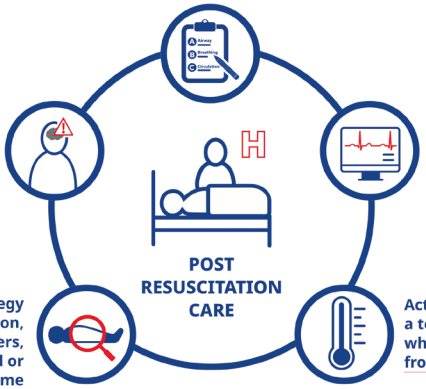
European Resuscitation Council and European Society of Intensive Care Medicine Guidelines 2025 Post-resuscitation Care

Developed in collaboration with the European Society of Intensive Care Medicine (ESICM), the ERC/ESICM Guidelines 2025 on Post-resuscitation Care focus on what happens after a cardiac arrest victim has been revived. The actions in these next few hours and days are crucial to any survivor's future health and well-being. The recommendations cover long-term medical care and psychological support as well.

KEY MESSAGES OF POST-RESUSCITATION CARE

After ROSC use ABCDE approach

- Insert an advanced airway (tracheal intubation when skills available)
- As soon as SpO_2 can be measured reliably or arterial blood gas values are obtained, titrate the inspired oxygen to achieve an arterial oxygen saturation of 94-98%, and ventilate lungs to achieve normocapnia
- Aim for a systolic blood pressure > 100 mmHg or a mean arterial pressure > 60–65 mmHg



Perform functional assessments of physical and non-physical impairments before discharge to identify rehabilitation needs and refer to early rehabilitation if indicated

Prioritise immediate coronary angiography for patients with clear ST-elevation on the ECG or other high suspicion of coronary occlusion (e.g. haemodynamic and/or electrical instability)

Use a multimodal strategy including clinical examination, electrophysiology, biomarkers, and imaging to predict good or poor neurological outcome

Actively prevent fever by targeting a temperature ≤ 37.5 °C for patients who remain comatose after ROSC from cardiac arrest

These recommendations represent the latest proven approaches for healthcare professionals to deal with an array of medical issues that arise immediately after resuscitation and survival from cardiac arrest. Every aspect of the recovery is touched upon: they cover how to treat post-cardiac arrest syndrome (which describes the effect of prolonged circulation stoppage on the body of survivors once the heart restarts); how to reoxygenate, often by mechanical ventilation in an intensive care unit; and how to ensure that the heart and the brain receive an optimal amount of oxygen and blood. The recommendations are extensive, covering the many complex medical issues that can present even in the weeks and months following intensive care medicine and hospital discharge.

In a patient who is in coma after cardiac arrest, prognostication aims at predicting whether this patient will awaken and recover the ability to conduct an independent life. This is a continuous process that starts immediately upon admission to the hospital and is based on many examinations, such as blood tests, electroencephalograms (brainwave monitoring), brain computed tomography scan, and brain function tests. The Guidelines recommend not making a prognosis until there is a clearer sense of the damage to the brain. Generally, this requires that 72 hours or more have passed since the arrest.

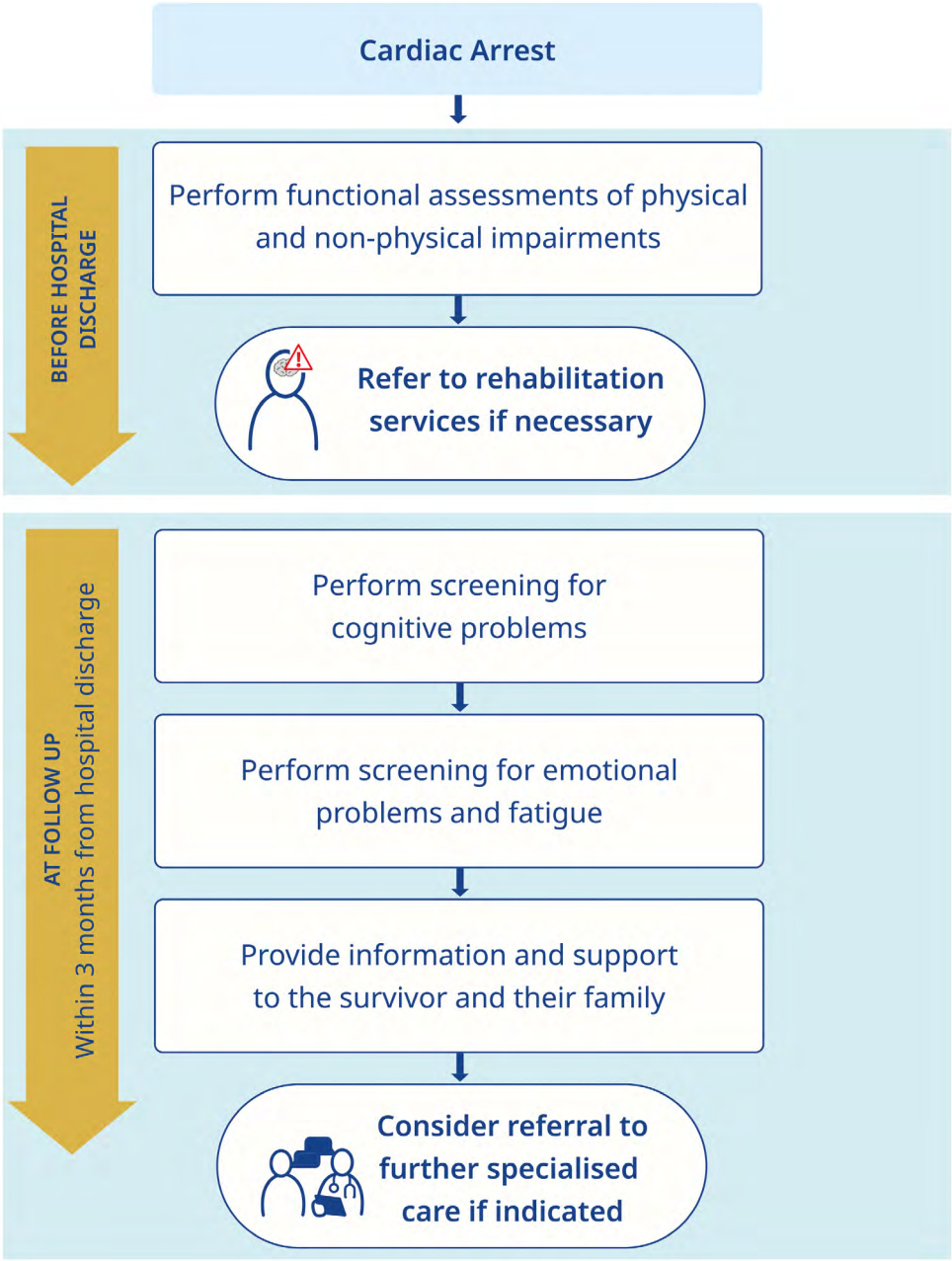
A new addition to the guidelines in 2025 recommends investigating the cases of unexplained cardiac arrest. In many patients who have a cardiac arrest outside the hospital, the cause is an acute heart attack (myocardial infarction). However, in other cases, the causes are less obvious and include several undetected cardiac diseases that require special investigations such as magnetic resonance imaging (MRI) of the heart, genetic testing and continuous cardiac monitoring. These investigations are essential to prevent future cardiac arrests.

> "Survival is not enough. The goal is to survive with a good quality of life."
>
> Jerry P. Nolan, Resuscitation 2015

The Guidelines suggest that healthcare professionals discuss organ donation with the family of deceased cardiac arrest victims. The act of donating an organ is one of the most meaningful contributions anyone can make to benefit others: lives will be saved. Cardiac arrest victims are often excellent potential donors of healthy organs. Because there is a chronic shortage of transplant organs throughout Europe, the recommendations call for healthcare systems to increase supportive and caring protocols that will increase the rate of organ donations.

Along with many technical topics, these Guidelines also deal with long-term issues, including ongoing care decisions, essential rehabilitation programming and the need for regular follow-up to offer psychological and emotional support for both survivors and co-survivors as they look to the future. ♥

RECOMMENDATIONS FOR IN-HOSPITAL FUNCTIONAL ASSESSMENTS, FOLLOW-UP AND REHABILITATION AFTER CARDIAC ARREST



Education for Resuscitation

Immediate CPR and prompt use of an AED are the key actions to save a cardiac arrest victim's life. To save as many lives as possible, bystanders need to be ready to step in to restart a heart if ever the need arises. And the only way to accomplish that is to train and prepare as many people as possible to become potential rescuers. ERC Guidelines 2025 Resuscitation for Education address this important issue. Many excellent courses are already available locally. The ERC recommends that these be expanded and grown with more opportunities to learn for all, without financial, linguistic, cultural or social barriers.

Meeting the challenge of training future rescuers demands an inclusive approach driven by best practices shaped to address local conditions, priorities and financial resources. What's more, the different audiences and their differing abilities to learn resuscitation education vary among ages, laypeople, first responders, and healthcare professionals. Types and modes of education must be tailored to the specific capacities of each learner and to their different locations and settings.

The ERC guidelines state that the priority is to train laypeople in basic rescue steps so they can help until medical professionals arrive. That is why emphasis is placed on the first three crucial steps: CHECK-CALL-CPR. The more bystanders who are trained to help, the greater the chance that help will be provided and with it the likelihood of more survivors. To assist lay responders in the heat of the moment, the guidelines call for training EMS phone dispatchers to recognise cardiac arrest and begin offering CPR and AED guidance via telephone.

The ERC recommends that very young children learn about resuscitation. By introducing the concept as early as 4 years of age and incorporating annual resuscitation training thereafter in schools, these kids will grow up to become knowledgeable and confident rescuers.

The guidelines call for a variety of approaches to make resuscitation training more effective, flexible and accessible for all learners. They advocate combining new technologies (gamification, real-time CPR feedback with automated manikins) with proven training techniques and self-directed learning. Over the last decade, online education via podcasts, videos and social media have become powerful tools to teach basic lifesaving skills. In addition, there has been increased emphasis on the use of hands-on CPR training using manikins during short teaching sessions, followed, when possible, with brief annual refresher training.

The ERC recommends different teaching approaches to boost bystander confidence, communication, and performance in emergency situations. One method, "Rapid Cycle Deliberate Practice" is simulation-based training during which learners do short, repetitive cycles of skill practice, followed immediately with constructive and corrective feedback from an instructor. Also recommended is "Spaced Learning," a technique that spreads lessons over time to deepen learners' abilities and comfort. This approach enhances memory retention and leads to quicker action in an emergency.

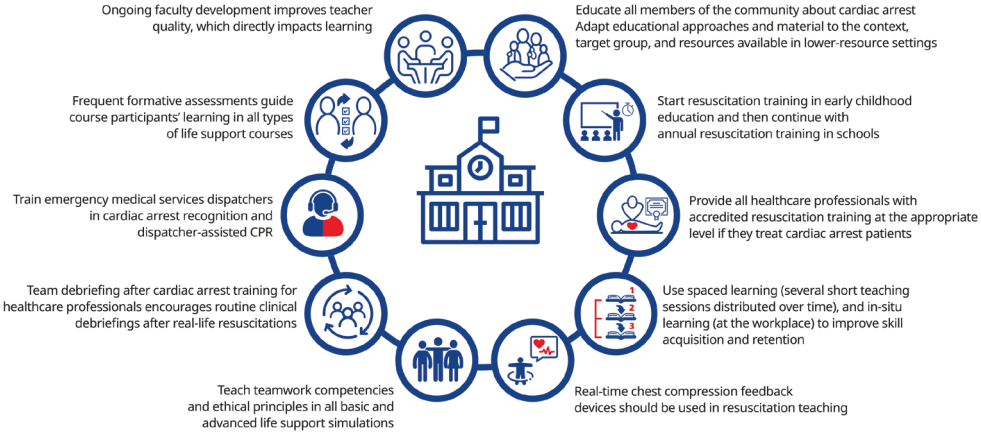
Further, this training period is the ideal time to address barriers or hesitancy that rescuers might experience (due to fear or lack of confidence) in an emergency situation. By including non-technical skills and psychological factors as part of the core competencies, CPR training will best prepare learners to act fast and effectively in an emergency.

"The need for improvement in the way CPR is taught has received scant attention but should no longer be ignored."

Douglas Chamberlain, Resuscitation 2003

The best way to ensure effective CPR training of the public is to properly train instructors. The ERC recommends specialised programs geared to all instructors teaching life support courses. The goal is to develop expertise in creating positive learning experiences for members of the public. In addition, educational approaches and materials (distance learning, technology-enhanced learning, hybrid resuscitation training, and the use of low-cost manikins) need to be adaptable for use in low-resource settings and remote areas. ♥

KEY MESSAGES IN EDUCATION FOR RESUSCITATION

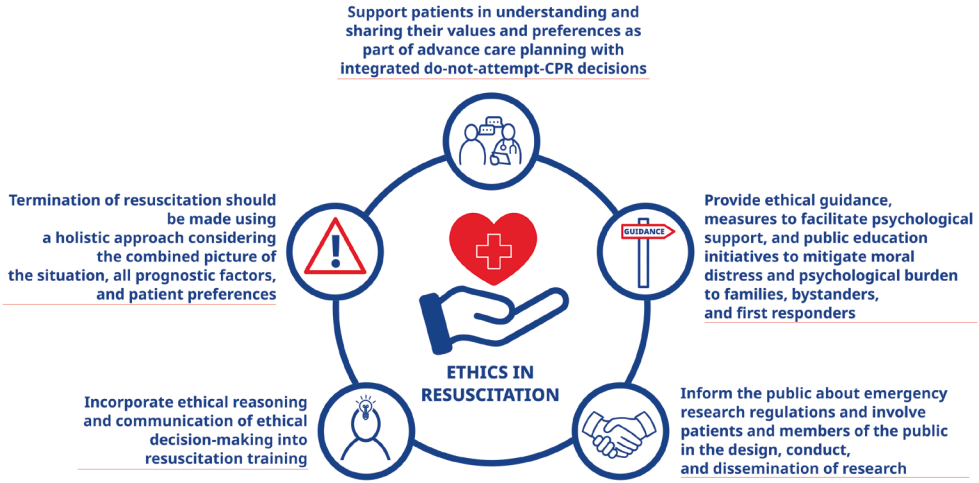


CPR - cardiopulmonary resuscitation

Ethics in Resuscitation

These Guidelines provide evidence-based recommendations covering a range of ethical issues related to resuscitation. The goal of these Guidelines is to ensure that everyone involved is able and prepared to make proper resuscitation decisions in keeping with patient values and wishes.

KEY MESSAGES OF ETHICS IN RESUSCITATION



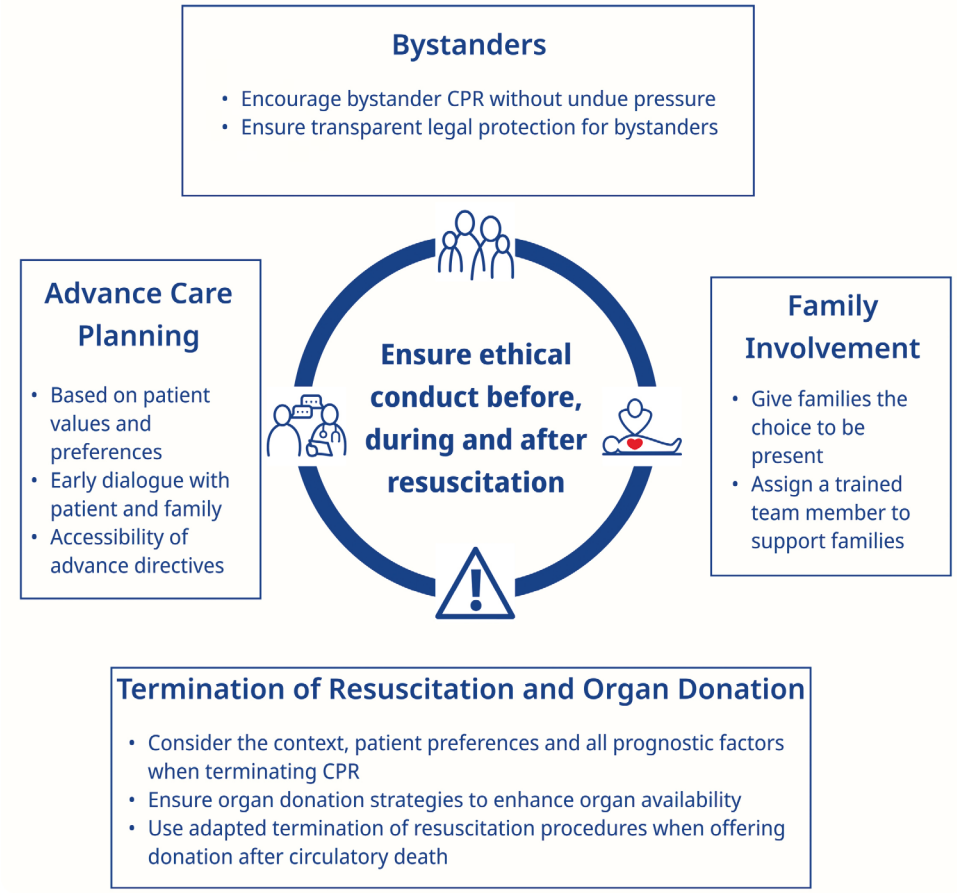
There are many recommendations geared for healthcare professionals, policymakers, educators and system administrators. They cover medical research and education, public involvement, delivery of care in settings and locations with limited resources, and other measures ensuring future resuscitation care will meet ethical standards.

There are several topics included that are of interest and relevance to the public. These include the challenges faced by bystanders stepping up to deliver CPR; the involvement of family throughout the process; and a patient's role to plan and provide directives for their medical care.

Bystander involvement

Many studies have looked at what bystanders and lay rescuers can and might do when encountering someone in cardiac arrest. It is a very intense and stressful situation and can be frightening. Sometimes the person in need may be a family member. Life-saving action requires close physical contact, perhaps with a stranger. This experience is often stressful and can sometimes be frightening or even traumatic.

ETHICAL CONSIDERATIONS BEFORE, DURING AND AFTER RESUSCITATION

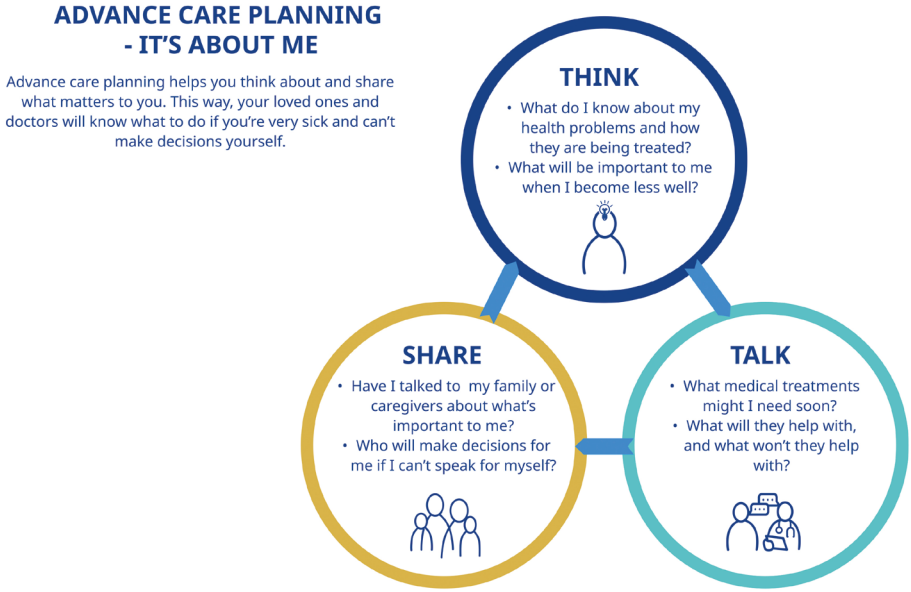


The Guidelines recommend educating and preparing an informed public to step forward quickly and freely in an emergency. They advise that the public should be trained not only in resuscitation skills and techniques, but also in how to handle the emotional and psychological aspects of helping in emergencies, including deciding to act. This includes clearly explaining local "Duty to Help" regulations and "Good Samaritan" laws.

Further, the Guidelines call for healthcare systems to have ways in place to support bystanders and first responders as they cope with the emotional toll of being involved in resuscitation efforts, including ready access to mental health services.

■ Advance care planning

Adult patients at any age or stage of health must be encouraged to share their values, expectations and preferences for medical treatment. This is about patients making their wishes known about



ongoing and future care. For example, their plan may include directives to not start CPR, or when to terminate resuscitation efforts and other medical interventions. For many, this process often includes designating a trusted person to step in as decision-maker should the patient no longer be capable of making their own decisions. To ease this difficult process, the Guidelines call for broad patient education about advance care planning and directives, how they are used, and why they should be reassessed regularly.

Family presence during CPR

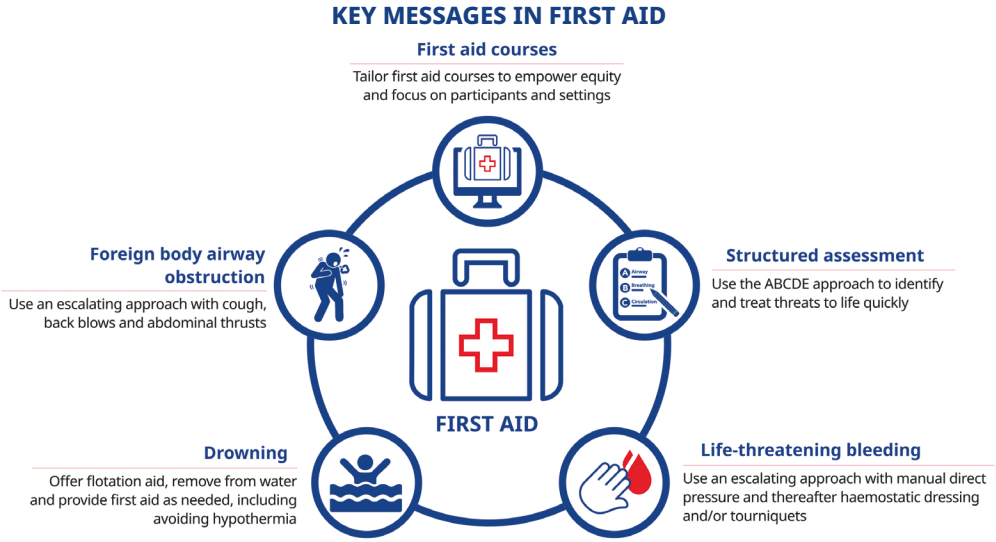
Cardiac arrest is a sudden and often a distressing event that can have a long-lasting impact on those close to the victim. The suddenness of the event increases the risk of complicated grief and post-traumatic stress disorder symptoms. Studies have shown that in many cases allowing parents and relatives to be present during resuscitation efforts can help reduce the trauma experienced. The Guidelines are clear on the importance of allowing family members of a patient to be present during the resuscitation attempt should they choose so. However, the presence of a team members to support the family is crucial. Therefore, these Guidelines call for hospitals to create protocols to ensure this happens and train their teams to support family members during resuscitation.

Organ donation in the context of cardiac arrest

The Guidelines, recognising the importance of organ donation in saving lives, emphatically recommend that healthcare systems create strategies to enable organ donation, to invest in education and communication to both the public and to healthcare professionals. Such efforts raise awareness, increase donation rates and improve organ availability, and more lives can be saved.

First Aid

First aid is best described as the initial helping response by anyone in any medical emergency in any circumstance.



ABCDE - airway, breathing, circulation, disability, exposure

It is the crucial first link in every chain of survival. All resuscitation, including basic and advanced life support, begins this way: recognising someone needs help and stepping up to assist; rapidly assessing the situation and calling for additional help as needed; and providing basic care based on the first aid skills you have learned. Out in the real world, there can be any number of medical emergencies. As a result, first aid training must be ready to deal with a wide range of serious conditions, from anaphylactic shock and asthma to opioid overdose, physical trauma (e.g. spinal injuries, concussions, bleeding) and "environmental emergencies" such as drowning or hypothermia.

For the purposes of the ERC Resuscitation Guidelines 2025, this summary focuses on these guidelines' recommendations for the prevention, treatment, and management of life-threatening conditions that could progress to cardiac arrest. Further information on the emergency management of cardiac arrest is described in the 2025 ERC Guidelines 2025 Basic Life Support.

The 2025 Guidelines emphasise the importance of members of the public being trained in life-saving techniques throughout Europe. The availability to the public of general, as well as specialised and advanced first aid courses is the key to saving lives in the community. Many excellent courses are already available locally. The ERC recommends that these be expanded with a focus on accessibility and diversity, in terms of fi-

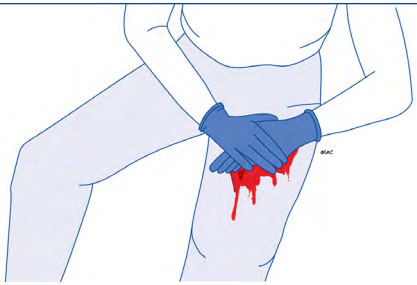
nancial, linguistic, cultural and social barriers. Course content must be tailored to audience needs and abilities and include measures to help any first aid provider cope with the stress, anxiety, and emotional distress of such an intense and unexpected event. Instructions should also include information on local "Good Samaritan" and "Duty to Respond" laws, which vary between locations.

To extend the society's ability to deliver prompt lifesaving first aid out in the community, the ERC calls for the prominent placement of public first aid kits. All workplaces, recreation and leisure centres, arenas, public buildings, homes and cars should have first aid kits. These kits should be geared to local conditions and needs, the kits should be clearly marked, readily accessible and properly maintained.

First aid: what to do first.

If you encounter a person appearing to need medical help, because they are ill, injured or in shock, here is what you need to do.

- Before anything else, perform a quick assessment of the situation. Is the person at risk of further injury? (Road traffic? Spilled chemicals? Live wires? Violent persons?) Is it safe for you to approach them? Can you move them to safety?
- Once you know the area is safe, check for responsiveness. Is the person responsive? Are they able to speak? Gently stimulate the person. Ask loudly, "Are you ok?"
- **If the person is responsive:** talk to them calmly. Ask for permission to check for any physical signs of illness or injury. As you continue to look them over, ask simple questions to learn about what happened; what they are experiencing; any serious allergies; any other relevant medical history.
- **If the person is unresponsive:** check for serious injuries. Is there life-threatening bleeding? If yes, apply direct pressure. Prepare to deliver chest compressions and rescue breaths.



Apply firm direct manual pressure to the bleeding injury

Recovery position

For adults and children with decreased responsiveness due to illness, with no signs of physical trauma and who do not need chest compressions and rescue breathing, it is best that they be positioned on their side, lying with legs and arms bent and head positioned to ease breathing. Continue to check the person for breathing difficulty and increasing unresponsiveness.

In cases of not normal breathing or trauma, do NOT move the person into the recovery position. If they are in cardiac arrest position them lying flat on their back for CPR.

Place adults and children with decreased level of responsiveness who do NOT meet the criteria for CPR into a side-lying recovery position

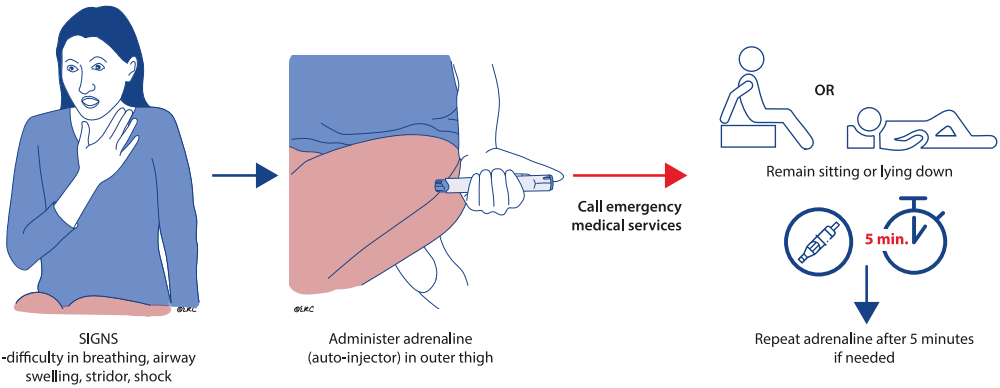
Getting to ABCDE

In any first aid situation, the ERC recommends the ABCDE approach to identify and treat threats to life. The assessment must be thorough but quick. (The ERC Guidelines 2025 Paediatric Life Support describes how to assess and treat children in this situation.) The ABCDE protocol is an easy to remember list to guide a rapid assessment and prepare to deliver basic first aid. It stands for: A- Airway, B- Breathing, C- Circulation, D- Disability, E- Exposure.

A- Airway	**Is the person´s airway open?** Has the person fallen from a height or experienced major trauma? (Consider cervical spine injury). 	▪ Place one hand on the forehead and the fingertips of your other hand under the point of the chin, gently tilt the person's head back, lifting the chin to open the airway. ▪ Do not move the person unless they are in an unsafe situation.
B- Breathing	**Is the person breathing normally?** ▪ "Look, Listen, Feel" for normal breathing for a maximum of 10 seconds. ▪ Listen for wheezing or noisy breathing. ▪ Is the person choking and unable to cough? Ask "Are you choking?". ▪ Is there any bluish discoloration of lips, nails, or skin? ▪ Is there any obvious swelling of the lips, tongue, and neck? 	▪ If unresponsive call your local emergency number and follow the dispatcher's instructions. ▪ If not breathing normally, start CPR. ▪ If you are trained, administer rescue breaths. ▪ If the person is breathing and you are trained, administer oxygen if legally allowed. ▪ If suspected severe allergic reaction (anaphylaxis) and you are trained, administer adrenaline 0.5 mg intramuscular*.

C- Circulation	**Does the person have chest pain?** Is there any pain in the chest, neck, or arm; or a "severe pressure in the chest"? Are there any signs of a low blood pressure or shock: ▪ Very fast or very slow heart rate? ▪ Pale, cool or clammy skin? ▪ Dizziness or confusion?	▪ Make the person comfortable. ▪ If suspected cardiac chest pain, give them chewable aspirin. ▪ Continue to monitor the person carefully for deterioration or loss of responsiveness (possible cardiac arrest).
D- Disability	**Assess level of responsiveness using the AVPU reminder:** ▪ **A:** Alert or confusion - new or deteriorating? ▪ **V:** Verbal - responds to your voice. ▪ **P:** Pain - responds to pain on squeezing their shoulder. ▪ **U:** Unresponsive	▪ If suspected concussion, the person should stop all sporting or physical activities. ▪ If suspected hypoglycaemia, give the person a sugar-containing drink or sweets or dextrose tablets (via mouth). ▪ If suspected opioid overdose, locate overdose kit (if available) and administer nasal naloxone.
E- Exposure	▪ Check for external injuries by checking the whole-body surface area (head, neck, trunk, and limbs). ▪ Measure core temperature (if possible).	▪ Stop any severe bleeding. ▪ Prevent hypothermia – remove wet clothes and use blankets to warm them. ▪ Hyperthermia – start active cooling by any means available, like removing clothing, using wet cloths, fans, cool water.

* ORDER OF ACTIONS FOR SEVERE ALLERGIC REACTION – ANAPHYLAXIS

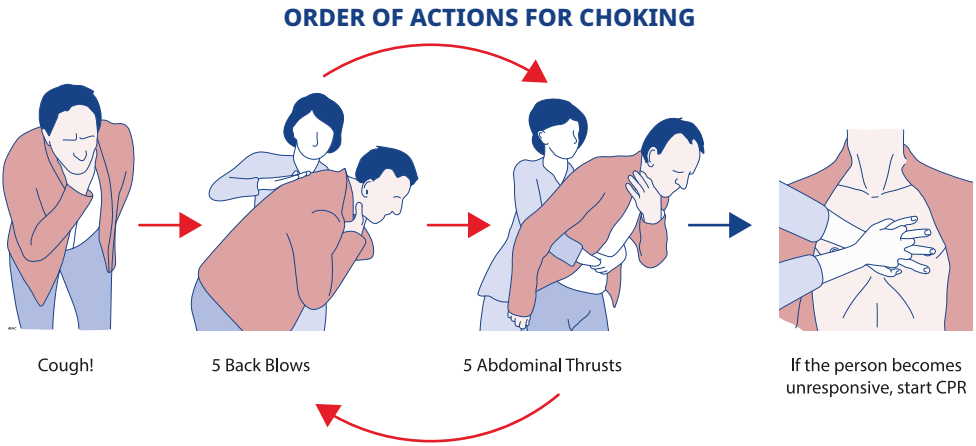


SIGNS
-difficulty in breathing, airway swelling, stridor, shock

Administer adrenaline (auto-injector) in outer thigh

Remain sitting or lying down

Repeat adrenaline after 5 minutes if needed



Specific conditions that may require or might lead to resuscitation (CPR)

The essentials of basic lifesaving always apply:

- Make sure the scene is safe for the person, bystanders and rescuers.
- Act quickly.
- Call for help.
- Follow the ABCDE approach.
- Begin chest compressions and rescue breaths if able.

Cardiac arrest

If you suspect cardiac arrest, immediately call your local emergency number and follow the dispatcher's instructions on performing CPR. Begin CPR without hesitation. Continue until professional help arrives, takes over, or instructs you to stop. The initial management of a cardiac arrest has been described in the ERC Guidelines 2025 Adult Basic Life Support.

Cardiac arrest in sports: While the risk of cardiac arrest among athletes during physical exercise is small, it is not uncommon. Studies show that recreational athletes, supporters, and fans may be less aware of the risk of cardiac arrest, emphasising the importance of awareness programs. Cardiac arrest during sport or exercise requires rapid recognition and effective treatment for survival. Rescuers should know that active athletes may show continuing abnormal breathing patterns which should not be confused with normal and effective breathing. When treated quickly, about a third of athletes survive.

Chest pain

Chest pain is the most common symptom of a heart attack. The pain is often described as pressure in the chest, and perhaps pain radiating to the neck, lower jaw, or left arm. Start by calling the local emergency number. Calmly reassure someone complaining of chest pain as you help them sit or lie comfortably while waiting for medical help. If possible, give adults (unless they say they are allergic) a chewable aspirin as soon as possible. Assist a person with diagnosed angina pectoris (severe chest pain from the heart) in self-administering their nitro-glycerine spray or tablets. Stay with the person until help arrives.

Choking

If suspected choking, encourage coughing, give back blows and abdominal thrusts as shown in the figure below.

If at any point, while assisting a choking person, they become unresponsive with no or abnormal breathing, start CPR immediately. These chest compressions can create high levels of airway pressures that may dislodge the obstruction. Even if it does not, continue CPR until help arrives.

Drowning

Accidental drowning is a serious public health problem, especially in low-resource settings. In Europe, drowning is the fourth leading cause of death in children aged 5-14 years, though those older than 50 years of age have the highest incidence. Drowning is defined as not being able to breath due to submersion in water or another liquid. With the lack of oxygen, the heart slows down and finally stops.

Evidence shows a better prognosis when drowned persons receive rescue breaths first before starting chest compressions. If following rescue from drowning the person is unresponsive and not breathing, promptly deliver 5 rescue breaths and then start standard CPR with chest compressions. In a small number of cases involving drowning (fewer than 10%), an AED can be effective in restoring normal heart beats. When available and after drying the chest, attach the AED; it will determine if there is a shockable rhythm. Follow the device's instructions.

Water rescue is often needed to prevent drowning and provide immediate life-saving interventions, but it can be very dangerous to bystander rescuers. It is strongly recommended that bystanders, especially those who are not strong swimmers, do not enter deep water. Instead, first, they should shout for help and have someone call the local emergency number. Then they should rely on indirect rescue methods such as using public rescue equipment, throwing any available flotation device, or reaching out with a long object.

Only if trained in water lifesaving skills should someone go into the water, taking with them any available lifesaving equipment. If the person in distress is not responsive, immediately deliver 5 rescue breaths before towing them to the shore.

Hypothermia

Hypothermia is common in both outdoor situations (mainly athletes and lost persons) and urban environments (homeless people and the intoxicated). Accidental hypothermia is defined as a decrease in core temperature during which vital signs and responsiveness fade, and the heart stops. Hypothermic persons in cardiac arrest should receive continuous CPR until warming has been re-established. Hypothermic persons should be protected from the cold and be transferred as fast as possible for rewarming. Chest compression and ventilation rate should follow the standard training protocol. Chances of recovery for persons suffering cardiac arrest as a result of mild to moderate hypothermia are excellent.

Prevent drowning

- Stay within arm's reach of children when in or near the water
- Swim in water-safe areas where there are lifeguards
- Always wear a lifejacket when using watercraft (e.g. boat, kayak, etc.)
- Engage with swimming and water safety lessons

Recognise early drowning

- Be aware that drowning may be silent
- Be aware that drowning may occur in shallow water
- Look for swimmers who are not making progress in any one direction
- Look for swimmers who are bobbing vertically in and out of the water
- Look for swimmers who have their head tilted back low in the water and mouth open gasping

Initial actions

- Call emergency medical services
- Do not enter the water if you are not trained
- Keep your eyes on the person or the area where they were last seen

Provide flotation device and remove from water

- Provide a flotation device, lifebuoy, rescue tube or other rescue equipment
- Keep the person´s head out of the water
- Retrieve the person to land or a rescue boat as soon as it is safe to do so

Provide first aid as needed

If unresponsive and not breathing:

follow "CPR after drowning algorithm"

If breathing:

- Use recovery position
- Keep the person warm
- Seek expert help if any concerns

CPR - cardiopulmonary resuscitation

Avalanche

Avalanche burial survival rates have improved thanks to teamwork in search and rescue and advances in medical care. Asphyxia (lack of oxygen) is the main cause of death, along with trauma, injuries, and hypothermia resulting from extended exposure. CPR can be challenging to do in these conditions but can be effective. Time is of the essence in locating persons affected by avalanche and beginning CPR.

In planes and on ships

While air travel is generally safe (studies show a very small chance of cardiac arrest during flights, about 1 in every 100,000 passengers), there are limited resources: not all airlines have AEDs and lifesaving equipment on board. If you witness a cardiac arrest on board an aircraft or ship, call for help immediately. If no one with medical training is aboard, start chest compressions. The Guidelines call for using existing BLS protocols. However, survival chances are lower due to limited medical help, resources, and longer transfers. In most cruise ships, telemedicine is available, and it should be used as early as possible.

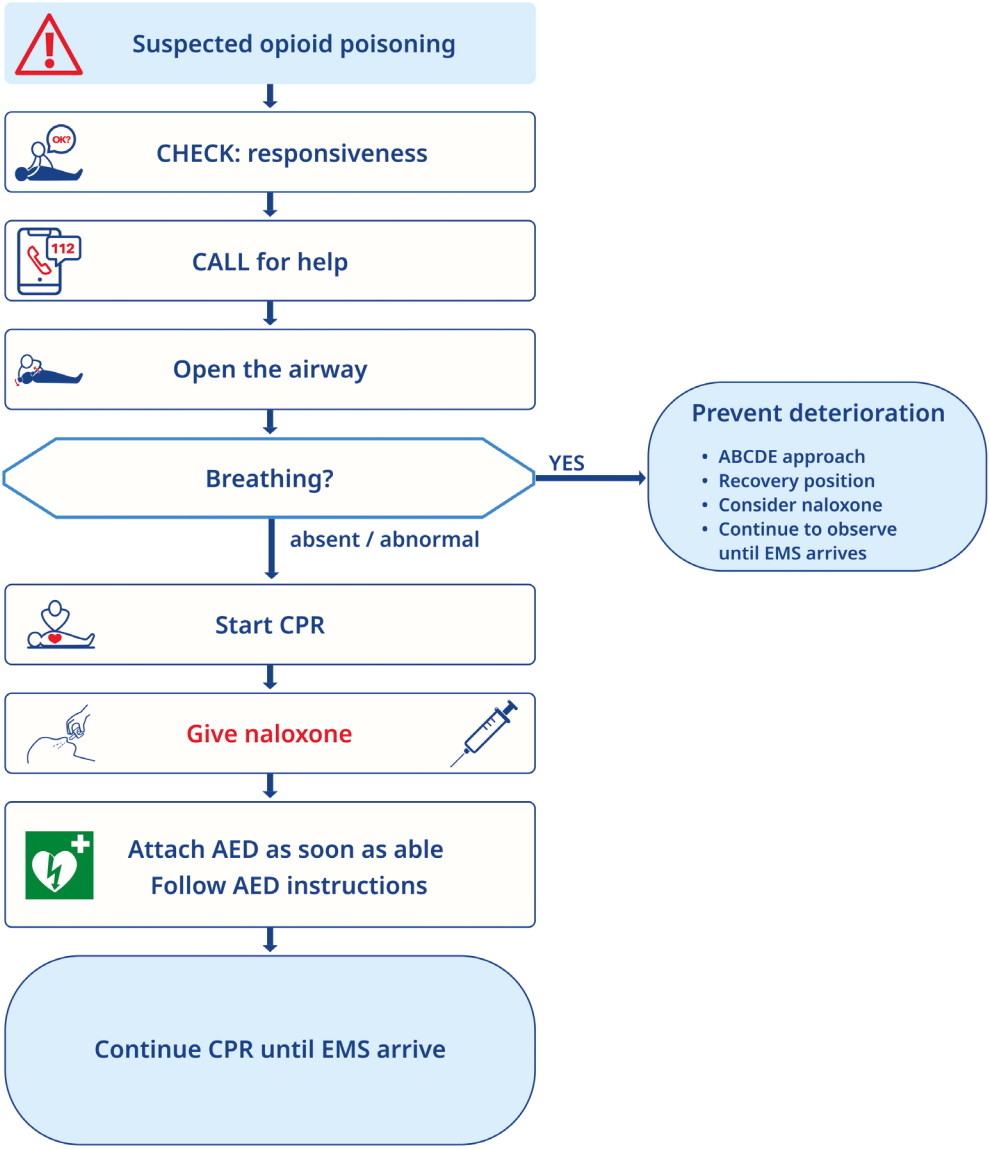
> "First aid is not a procedure—it is a social interaction"
>
> David Zideman, Resuscitation 2015

Opioid overdose

Suspect an opioid overdose if the person is breathing slowly, the breathing is irregular or absent, the person is extremely drowsy or unresponsive, or the person has small pupils.

- If the person is responsive and breathing, consider administering naloxone (if available) and position them in the recovery position. Reassess following ABCDE.
- If unresponsive and not breathing normally, call your local emergency number, start CPR and administer naloxone (if available).
- Reassess the person according to ABCDE.

ORDER OF ACTIONS FOR OPIOID OVERDOSE



CPR – cardiopulmonary resuscitation; AED – automatic external defibrillator; EMS – emergency medical services; ABCDE – airway, breathing, circulation, disability, exposure

How the ERC develops guidelines

The European Resuscitation Council (ERC) was founded as a multidisciplinary and multiprofessional scientific society in 1988 with one main goal: "To save human life by improving standards of resuscitation in Europe, and by coordinating the activities of European organisations with a legitimate interest in cardiopulmonary resuscitation". Since 1992, the ERC has published guidelines on how to prevent and treat cardiac arrest and life-threatening emergencies. These guidelines are updated regularly to reflect the latest science — every five years since 2000. These high-quality, evidence-informed ERC guidelines are used to organise resuscitation in healthcare systems, to guide healthcare professionals in their daily clinical practice, and to build the basis for the ERC's teaching and training program, which is offered in different course formats.

The ERC works closely with the International Liaison Committee on Resuscitation (ILCOR), which reviews research from around the world and publishes yearly summaries of the evidence. The ERC then uses this evidence to write its guidelines. Often in resuscitation science there is no or insufficient evidence to form an evidence-informed recommendation. In these cases, experts formulate their advice based on best clinical experience and practice. These new ERC Guidelines 2025 were reviewed by the national resuscitation councils associated with the ERC and the general public in an open process.

The ERC guidelines are developed by a committee led by the ERC's director of guidelines. To make sure the guidelines are clear and useful, the ERC appointed writing groups with a diverse range of members from different medical specialties who translate scientific evidence into guideline recommendations.

Because resuscitation often happens in emergencies, the ERC publishes short, easy-to-follow supporting material for the implementation of the ERC Guidelines 2025, like algorithms and pocket guides that provide step-by-step instructions. These are designed for healthcare workers but can also be used by trained or untrained lay people. The latest ERC guidelines on resuscitation 2025, along with algorithms, pocket cards, leaflets and this special brochure for lay people, can be downloaded for free from the ERC webpage (https://erc.edu/guidelines-2025/materials).

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