CANADIAN RESUSCITATION GUIDELINES

2025

Heart & Stroke™

HIGHLIGHTS AT A GLANCE

1. Ethics

The 2025 Guidelines chapter on ethics

- Provides narrative discussion focused specifically on ethics, with sufficient depth to allow readers to navigate the issues most encountered in this domain.
- Multiple ethical frameworks, a preponderance of scholarship and expert consensus in this writing group support the imperative that HCPs and their organizations should actively address inequities in social determinants of health, thereby eliminating resulting disparities in cardiac arrest and emergency cardiovascular care.
- Reviews the many complexities in resuscitation, including the inability of the patient to participate in decisions and the challenges across the age continuum from newborns to geriatric patients, and considers the long-term effects of CPR on patients, families, and health care professionals alike.

The writing group performed a comprehensive series of structured literature reviews. All content in this chapter is new compared with the content in previous Guidelines, although the underlying ethical considerations are largely consistent with those that informed previous Guidelines.

2. Systems of Care

Algorithms and Visual Aids

A single Chain of Survival is intended to apply to adult and pediatric in-hospital cardiac arrest (IHCA) and out-of-hospital cardiac arrest (OHCA). In creating this singular chain, it is acknowledged that before cardiac arrest, prevention and preparedness can both avoid the need for and optimize resuscitation.

Prevention of IHCA

Implementation of safety huddles to improve situational awareness in scenarios involving high-risk hospitalized patients and mitigate their deterioration can be effective in reducing cardiac arrest rates.

Public Access to Naloxone

Public policies should allow for possession, use, and immunity from civil and criminal liability for good-faith administration of naloxone by lay rescuers.

Naloxone distribution programs can be beneficial to increase naloxone availability among lay rescuers and decrease mortality from opioid-related overdose.

Community Initiatives to Improve Lay Rescuer Response to OHCA

Implementing a bundle of community initiatives is a reasonable strategy to improve lay rescuer response to OHCA.

Increasing the availability of instructor-led training in communities can be effective to improve lay rescuer response to OHCA.

Mass media campaigns may be considered to promote learning of CPR skills in all populations.

It may be reasonable for communities to implement policies that require CPR certification in the general public.

Clinical Debriefing

Incorporating immediate and delayed debriefing is reasonable and may identify different opportunities for system improvement.

OHCA Team Composition

It can be beneficial to have an advanced life support (ALS)–level clinician present during the resuscitation of a person with suspected OHCA.

It is reasonable to ensure that emergency medical services (EMS) systems have a team size sufficient to achieve discretely assigned roles within the team.

In-Hospital Code Team Composition

In-hospital code teams should comprise members with ALS training.

Designated or dedicated code teams with clearly defined roles, diverse expertise, and adequate training that incorporates simulation can be beneficial in improving patient outcomes following IHCA.

On-Scene OHCA Resuscitation

EMS systems should be prepared to perform termination of resuscitation on scene; this involves EMS professionals receiving training on death notification.

Prioritizing on-scene resuscitation focused on achieving sustained ROSC before initiation of transport for most adults and children experiencing OHCA can be beneficial in the absence of special circumstances.

Extracorporeal Systems of Care

It is reasonable that centers with ECPR programs develop and frequently reassess patient selection criteria to maximize cardiac arrest survival, ensure equitable access, and limit futility.

It is reasonable that clinicians performing adult peripheral ECPR cannulation be experienced in percutaneous technique.

A regionalized approach to ECPR is reasonable to optimize outcomes and resource utilization.

Rapid intra-arrest transport for ECPR may be considered for limited, highly selected adult OHCA patients.

Organ Donation

Institutions should develop systems of care focused on facilitating and evaluating organ donation after cardiac arrest consistent with local legal and regulatory requirements.

Improving Cardiac Arrest Recovery

The recovery and long-term functional outcomes of cardiac arrest survivors are likely to benefit from the use of integrated systems that assess patients before discharge, reassess their needs after discharge, and address these needs on an ongoing basis during recovery.

3. Neonatal Life Support

Algorithms and Visual Aids

The Neonatal Resuscitation Algorithm has been updated to emphasize the importance of umbilical cord management at birth. The target oxygen saturation table starts at 2 minutes because deferred cord clamping for 60 seconds or more means that oxygen saturation at 1 minute will not routinely be obtained. Electrocardiography is recommended before chest compressions.

Newborn outcomes are affected by the overall context in which neonatal resuscitation occurs, including the systems of care before, during, and after birth. The newborn chain of care provides a framework for addressing essential elements of the health care system to enhance newborn health.

Umbilical Cord Management

For term newborn infants who do not require immediate resuscitation, deferred cord clamping for at least 60 seconds can be beneficial when compared with immediate cord clamping.

For nonvigorous term newborn infants and late preterm infants 35 weeks or more gestational age, intact cord milking may be reasonable when compared with immediate cord clamping.

For newborn infants born at less than 37 weeks of gestation who do not require immediate resuscitation, deferred cord clamping for at least 60 seconds is recommended when compared with immediate cord clamping.

Ventilation and Continuous Positive Airway Pressure

For newborn infants, initial peak inflation pressures of 20 to 30 cm H2O are reasonable, with adjustment of peak inflation pressures to provide effective ventilation.

It is reasonable to provide ventilation at a rate of 30 to 60/ min in newborn infants.

Video laryngoscopy can be useful for newborn infants who require endotracheal intubation.

It is reasonable to use a laryngeal mask as an alternative to endotracheal intubation for newborn infants at 34 0/7 weeks or more gestational age for whom ventilation via face mask is unsuccessful.

It may be reasonable to use a laryngeal mask as the primary interface to administer ventilation instead of a face mask for newborn infants born at 34 0/7 weeks or more gestational age.

Oxygen

A pulse oximeter should be placed as soon as possible for newborn infants receiving respiratory support or supplemental oxygen.

In preterm newborn infants born at less than 32 weeks' gestational age receiving respiratory support at birth, it may be reasonable to begin with 30% to 100% oxygen.

Chest Compressions

It may be reasonable to compress over the lower third of the sternum, taking care to be above the xiphoid process when providing chest compressions to newborn infants.

It may be reasonable to change compressors every 2 to 5 minutes when providing chest compressions to newborn infants and to switch compressors while heart rate is being assessed.

4. Pediatric Basic Life Support

Components of High-Quality CPR

For infants and children in cardiac arrest, interruptions in CPR should be minimized and pauses in chest compressions should be less than 10 seconds.

Sequence of Resuscitation

For infants, rescuers should compress the sternum with the heel of 1 hand or using the 2 thumb–encircling hands technique. If the rescuer cannot physically encircle the chest, it is recommended to compress the chest with the heel of 1 hand.

Foreign-Body Airway Obstruction

For children with severe foreign-body airway obstruction (FBAO), repeated cycles of 5 back blows alternated with 5 abdominal thrusts should be performed until the object is expelled or the child becomes unresponsive.

For infants with severe FBAO, repeated cycles of 5 back blows alternating with 5 chest thrusts should be performed until the object is expelled or the infant becomes unresponsive.

5. Adult Basic Life Support

Algorithms and Visual Aids

The Health Care Professional Basic Life Support (BLS) Algorithm was updated to illustrate the role of opioid antagonists (e.g., naloxone) for suspected opioid overdose during respiratory and cardiac arrest.

A new algorithm for the management of adult FBAO was added to show the approach of using back blows as the initial manoeuvre, followed by abdominal thrusts. For patients with severe obstruction, the rescuer is directed to activate the emergency response system because once the person becomes unconscious, they can rapidly progress to cardiac arrest.

Airway Management

For an adult with head and neck trauma, if the airway cannot be opened with a jaw thrust and airway adjunct insertion, trained rescuers should open the airway using a head tilt–chin lift.

Ventilation

When ventilating an adult patient in cardiac arrest, it is reasonable to give enough tidal volume to produce visible chest rise.

When providing breaths to adult patients in cardiac arrest, rescuers should avoid hypoventilation (too few breaths or too little volume) or hyperventilation (too many breaths or too large a volume).

Compression-to-Ventilation Ratio

It is reasonable for lay rescuers and health care professionals to perform CPR with cycles of 30 compressions followed by 2 breaths before placement of an advanced airway (e.g., supraglottic airway or endotracheal tube).

Defibrillation Pads

When placing pads for defibrillation for an adult in cardiac arrest, it might be reasonable to adjust the position of a bra instead of removing it.

CPR for Adults With Obesity

CPR for adults with obesity who are in cardiac arrest should be provided using the same techniques as for patients without obesity.

Alternative Techniques for CPR

The routine use of mechanical CPR devices is not recommended for adult cardiac arrest.

In adult cardiac arrest, the use of mechanical CPR devices may be considered in specific settings where the delivery of high-quality manual compressions may be challenging or dangerous for the health care professionals as long as they strictly limit interruptions in CPR during deployment and removal of the device.

Foreign-Body Airway Obstruction

For adults with severe FBAO, repeated cycles of 5 back blows (slaps) followed by 5 abdominal thrusts should be performed until the object is expelled or the person becomes unresponsive.

6. Pediatric Advanced Life Support

Drug Administration During Cardiac Arrest

For infants and children in cardiac arrest with initial non-shockable rhythm, it is reasonable to administer the initial dose of epinephrine as early as possible.

Measuring Physiology During CPR

For infants and children with invasive airways in place during CPR, end-tidal carbon dioxide ($ETCO_2$) monitoring may be considered to monitor CPR quality.

A specific $ETCO_2$ cutoff value alone should not be used as an indication to end resuscitative efforts in infants and children.

For infants and children with continuous invasive arterial blood pressure monitoring in place during CPR, it may be reasonable for health care professionals to target a diastolic blood pressure of 25 mm Hg or greater in infants and 30 mm Hg or greater in children 1 year of age or older.

Treatment of Supraventricular Tachycardia With a Pulse

For infants and children with supraventricular tachycardia and cardiopulmonary compromise unresponsive to vagal manoeuvres, adenosine, and electrical synchronized cardioversion and for whom expert consultation is not available, it may be reasonable to consider intravenous (IV) procainamide, amiodarone, or sotalol. NOTE: IV Sotalol is not available in Canada.

Post–Cardiac Arrest Management

After cardiac arrest in infants and children, it is recommended to maintain systolic and mean arterial blood pressure greater than the 10th percentile for age.

Prognostication Following Cardiac Arrest

It is recommended that health care professionals consider multiple modalities when they are predicting neurological outcomes (favorable or unfavorable after resuscitation from cardiac arrest in infants and children).

The usefulness of cough or gag reflexes or response to pain to support a favorable or unfavorable neurological prognosis at any time point after cardiac arrest in infants and children is not well established.

When interpreted in the context of other prognostic criteria, it is reasonable to use electroencephalography (EEG) up to 72 hours after cardiac arrest in infants and children to support a favorable or unfavorable neurological prognosis.

Post–Cardiac Arrest Recovery and Survivorship

It is reasonable that infants and children who survive cardiac arrest be evaluated for physical, cognitive, and emotional needs to guide follow-up care within the first year following cardiac arrest.

7. Adult Advanced Life Support

Algorithms and Visual Aids

The Termination of Resuscitation Algorithm was updated to include BLS and universal termination of resuscitation rules. An updated algorithm for the management of bradycardia in adults with a pulse has been added.

Vector Change and Double Sequential Defibrillation

The usefulness of vector change defibrillation for adults in cardiac arrest with persisting ventricular fibrillation/pulseless ventricular tachycardia after 3 or more consecutive shocks has not been established.

The usefulness of double sequential defibrillation for adults in cardiac arrest with persisting ventricular fibrillation/pulseless ventricular tachycardia after 3 or more consecutive shocks has not been established.

Initial Vascular Access

It is recommended that health care professionals first attempt establishing IV access for drug administration in adult patients in cardiac arrest.

Intraosseous (IO) access is reasonable if initial attempts at IV access are unsuccessful or not feasible for adult patients in cardiac arrest.

Vasopressor Medications

In consideration of timing, for adult patients in cardiac arrest with a shockable rhythm, it is reasonable to administer epinephrine after initial defibrillation attempts have failed.

Vasopressin alone or vasopressin in combination with epinephrine offers no advantage as a substitute for epinephrine for adult patients in cardiac arrest.

Nonvasopressor Medications

For adults in cardiac arrest, the use of β-blockers, bretylium, procainamide, or sotalol for ventricular fibrillation/pulseless ventricular tachy-cardia unresponsive to defibrillation is of uncertain benefit.

Adjuncts to CPR

Head-up CPR in adults with cardiac arrest is not recommended except in the setting of clinical trials.

Termination of Resuscitation Measures

In a tiered EMS system with both ALS and BLS professionals, it is reasonable to use the universal termination of resuscitation rule for adult patients with OHCA.

Wide-Complex Tachycardia

Synchronized cardioversion is recommended for acute treatment of adult patients with hemodynamically unstable wide-complex tachycardia.

Synchronized cardioversion is recommended for acute treatment of adult patients with hemodynamically stable wide-complex tachycardia when vagal manoeuvres and pharmacological therapy is ineffective or contraindicated.

Atrial Fibrillation or Flutter With Rapid Ventricular Response

For synchronized cardioversion of AF in adults using any currently US-approved biphasic waveform defibrillator, an initial energy setting of at least 200 J is reasonable and incremented in the event of shock failure, depending on the biphasic defibrillator used. In Canada, all defibrillators – including automated external defibrillators (AEDs) – must be listed on Health Canada's Medical Devices Active Licence Listing (MDALL) before they can be legally sold or imported.

The usefulness of double synchronized cardioversion of AF in adults as an initial treatment strategy is uncertain.

For synchronized cardioversion of atrial flutter in adults, an initial energy setting of 200 J may be reasonable and incremented in the event of shock failure, depending on the biphasic defibrillator used.

Initial Management of Bradycardia

In adult patients with persistent hemodynamically unstable bradycardia refractory to medical therapy, temporary transvenous pacing is reasonable to increase heart rate and improve symptoms.

8. Post-Cardiac Arrest Care

Algorithms and Visual Aids

Neuroprognostication is a key component of post–cardiac arrest care to ensure appropriate utilization of resources, withdrawal of life-sustaining therapy, and optimization of patient outcomes. The Adult Post–Cardiac Arrest Care Algorithm has been updated to reflect new science in this area.

Blood Pressure in Adults After Cardiac Arrest

Hypotension should be avoided in adults after ROSC by maintaining a minimum MAP of at least 65 mm Hg.

Diagnostic Studies for Adults After Cardiac Arrest

It may be reasonable to perform head-to-pelvis computed tomography (CT) for adult patients after ROSC to investigate the etiology of cardiac arrest and complications from resuscitation.

It may be reasonable to perform echocardiography or point-of-care cardiac ultrasound for adult patients after ROSC to identify clinically significant diagnoses requiring intervention.

Temperature Control for Adults After Cardiac Arrest

It is reasonable that temperature control be maintained for at least 36 hours in adult patients who remain unresponsive to verbal commands after ROSC.

Percutaneous Coronary Intervention for Adults After Cardiac Arrest

Coronary angiography is recommended before hospital discharge in adult cardiac arrest survivors with suspected cardiac etiology, particularly in the presence of an initial shockable rhythm, unexplained left ventricular systolic dysfunction, or evidence of severe myocardial ischemia.

Temporary Mechanical Circulatory Support for Adults After Cardiac Arrest

In highly selected adult patients with refractory cardiogenic shock after cardiac arrest and ROSC, temporary mechanical circulatory support may be considered.

Diagnosis and Management of Myoclonus in Adults After Cardiac Arrest

Treatment to suppress myoclonus without an EEG correlate is not recommended in adult survivors of cardiac arrest.

Neuroprognostication

When evaluated with other prognostic tests, it may be reasonable to consider a continuous EEG background without discharges within 72 hours after cardiac arrest to support the prognosis of favorable neurological outcome in adult patients who remain comatose after ROSC.

Recovery and Survivorship After Cardiac Arrest

It is recommended that cardiac arrest survivors and their caregivers have structured assessment and treatment of or referral for emotional distress after medical stabilization and before hospital discharge.

9. Cardiac Arrest Due To Special Circumstances

Life-Threatening Asthma Exacerbation

It may be reasonable to use ECLS for adults and children with life-threatening asthma refractory to standard therapies.

Treatment with volatile anesthetics for adults and children with life-threatening asthma refractory to standard therapies may be considered.

Life-Threatening Hyperkalemia

The effectiveness of IV calcium administration for adults and children in cardiac arrest from suspected hyperkalemia is not well established.

Life-Threatening Hypothermia

It is reasonable to use prognostication scores to guide the decision for initiating ECLS rewarming for adults and children in hypothermic cardiac arrest.

It may be reasonable to rewarm adults and children with severe environmental hypothermia (core temperature, <28 °C [84 °F]) and not in cardiac arrest using ECLS.

Life-Threatening Hyperthermia

It is reasonable to choose immersion in ice water (1-5 °C [33.8-41 °F]) over other cooling methods in adults and children with life-threatening hyperthermia.

It is reasonable to cool adults and children with life-threatening hyperthermia as rapidly as possible with a decrease of at least 0.15 °C/min (0.27 °F/min).

Left Ventricular Assist Devices

In unresponsive adults and children with durable left ventricular assist devices (LVADs) and impaired perfusion, chest compressions should be performed.

In unresponsive adults and children with durable LVADs and impaired perfusion, it may be reasonable to start chest compressions immediately while simultaneously assessing for device-related reversible causes.

Cardiac Arrest During Pregnancy

Preparation for resuscitative delivery for a pregnant patient in cardiac arrest should begin at the recognition of cardiac arrest, with the goal to complete delivery by 5 minutes.

It is reasonable to use ECPR in pregnant or peripartum patients in cardiac arrest not responsive to standard resuscitation.

A massive transfusion protocol with a balanced transfusion strategy should be used for peripartum patients with suspected life-threatening amniotic fluid embolism.

Toxicology: Opioid Overdose

For lay and trained rescuers, opioid antagonist administration may be reasonable for adults and children in cardiac arrest with suspected opioid overdose, provided that opioid antagonist (e.g., naloxone) administration does not interfere with the delivery of standard resuscitation, including high-quality CPR with breaths.

Adults and children who are treated for opioid overdose should receive an opioid antagonist (e.g., naloxone) and instruction on how to use it at the time of discharge from a health care setting.

10. Education Science

Use of Feedback Devices During CPR Training

Feedback devices are recommended for use during CPR training for health care professionals.

Feedback devices are recommended for use during CPR training for lay rescuers.

Rapid-Cycle Deliberate Practice

It may be reasonable to incorporate rapid-cycle deliberate practice as part of BLS or ALS training for health care professionals.

Teamwork and Leadership Training

It is recommended that life support training for health care professionals includes a specific emphasis on teamwork competencies.

Gamified Learning

It may be reasonable to use gamified learning elements as a component of resuscitation training for health care professionals.

It may be reasonable to use gamified learning elements as a component of CPR instruction for lay rescuers.

Virtual Reality and Augmented Reality

It may be reasonable to use VR to support knowledge acquisition in BLS and ALS training for lay rescuers and health care professionals.

The use of augmented reality to provide real-time CPR feedback may be considered for BLS training of lay rescuers and health care professionals.

Virtual reality should not be used to teach CPR skills in lay rescuers and health care professionals.

Opioid Overdose Training for Lay Rescuers

It is recommended that lay rescuers receive education on recognition and initial treatment steps for people who have an opioid-associated OHCA.

The optimal training method for lay rescuers in recognizing and intervening in opioid overdose has not been established.

Disparities in Education

It is recommended to focus and tailor lay rescuer CPR training to specific racial and ethnic populations as well as neighborhoods with high densities of these populations and incorporate awareness efforts in these areas.

It is recommended to address barriers to performing lay rescuer CPR on women through educational training and public awareness efforts.

It is recommended to focus on low socioeconomic status populations and neighborhoods for lay rescuer CPR training and awareness efforts.

It is reasonable to address barriers to linguistically isolated communities by increasing availability and access to CPR training materials in diverse languages.

It is reasonable to consider cost-effective methods for CPR training and to promote safe access to CPR training for low socioeconomic status populations and settings.

CPR Training in School Children

It is recommended to start CPR training in children younger than 12 years of age to increase willingness and self-confidence in later years.

Alternative Objects for Chest Compression Training in Lay Rescuers

The usefulness of alternative objects to train lay rescuers in chest compressions, when compared with a mannequin, is not well established.

Scripted Debriefing

It may be reasonable for an instructor to use a debriefing script during resuscitation education.

Use of Cognitive Aids

It may be reasonable for health care professionals to use cognitive aids during resuscitation.

It is not recommended for lay rescuers to use cognitive aids during resuscitation.

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