

2022 SYSTEMATIC REVIEW OF PREHOSPITAL EVIDENCE- BASED GUIDELINES

Evidence Summary

EXECUTIVE SUMMARY

Multiple national organizations and federal agencies have promoted the development, implementation, and evaluation of evidence-based guidelines (EBGs) for prehospital care. Previous efforts have identified opportunities to improve the quality of prehospital guidelines and highlighted the value of high-quality EBGs to inform initial certification and continued competency activities for EMS personnel.

In 2022, the Prehospital Guidelines Consortium (PGC), as part of a collaboration with the National Registry of EMTs (NREMT), completed and published a systematic review of prehospital guidelines published from January 2018 to April 2021. This review aimed to identify all guidelines providing recommendations for prehospital clinical care or operations and evaluate the quality of individual guidelines using standardized criteria. Members of the PGC performed a systematic search of the literature in Ovid Medline and EMBASE from January 2018 to April 2021, excluding guidelines identified in a prior systematic review. Publications were retained if they were:

1. relevant to prehospital care,
2. based on an organized review of the literature, and
3. focused on providing recommendations for clinical care or operations.

Included guidelines were appraised to identify if guidelines met the National Academy of Medicine (NAM) criteria for high-quality guidelines and scored across the six domains of the Appraisal of Guidelines for Research and Evaluation (AGREE) II tool, which is a widely used tool for assessing the quality of guidelines.

We identified 75 guidelines addressing a variety of clinical and operational aspects of EMS medicine. About half addressed time-/life-critical conditions (n=39, 52%) and 33 (44%) contained recommendations relevant to non-clinical/operational topics. Less than half (n=35, 47%) were based on a systematic review of the literature. Nearly one third (n=24, 32%) of guidelines met all NAM criteria for clinical practice guidelines, which were identified as “high quality guidelines” based on the NREMT’s framework for prioritizing and incorporating prehospital evidence into competency assessments. The full details of this systematic review have been published and are openly available to the public in the publication [2022 Systematic Review of Evidence-Based Guidelines for Prehospital Care](#).¹

The 24 guidelines meeting all NAM criteria included ten guidelines from the European Resuscitation Council and seven guidelines from the American Heart Association. These were primarily based on the International Liaison Committee on Resuscitation systematic reviews of available scientific literature and represented updates of guidelines focused on cardiovascular resuscitation or first aid. An additional seven guidelines on a variety of additional EMS topics were also identified as meeting all NAM criteria for high-quality guidelines.

This document provides succinct summaries of each prehospital guideline meeting all NAM criteria for high-quality guidelines, which can be used for educational purposes relevant to initial certification and continued competency activities for EMS personnel.

¹ [Martin-Gill C et al. 2022 Systematic Review of Evidence-Based Guidelines for Prehospital Care. Prehosp Emerg Med 2022 Nov 11;1-25.](#)

Table. Guidelines from the 2022 Prehospital EBG Systematic Review meeting all National Academy of Medicine criteria (*organized by author*).

Primary Author, Publication Date	Title	Accessibility, with hyperlink	Document Bookmark
Babl, 2021	Australian and New Zealand Guideline for Mild to Moderate Head Injuries in Children	Paid Access	Page 4
Charlton, 2019	2019 American Heart Association and American Red Cross Focused Update for First Aid: Presyncope: An Update to the American Heart Association and American Red Cross Guidelines for First Aid	Free Access	Page 6
Duff, 2019	2019 American Heart Association Focused Update on Pediatric Basic Life Support: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care	Free Access	Page 8
Duff, 2019	2019 American Heart Association Focused Update on Pediatric Advanced Life Support: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care	Free Access	Page 10
Escobedo, 2019	2019 American Heart Association Focused Update on Neonatal Resuscitation: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care	Free Access	Page 12
Gowens, 2018	Consensus statement: a framework for safe and effective intubation by paramedics	Free Access	Page 14
Greif, 2021	European Resuscitation Council Guidelines 2021: Education for resuscitation.	Paid Access	Page 16
Hachimi-Idrissi Dobias, 2020	Approaching acute pain in emergency settings; European Society for Emergency Medicine (EUSEM) guidelines-part 2: management and recommendations	Paid Access	Page 18
Lyng, 2019	Non-Auto-Injector Epinephrine Administration by Basic Life Support Providers: A Literature Review and Consensus Process	Free Access	Page 20
Madar, 2021	European Resuscitation Council Guidelines 2021: Newborn resuscitation and support of transition of infants at birth	Paid Access	Page 22
Mentzelopoulos, 2021	European Resuscitation Council Guidelines 2021: Ethics of resuscitation and end of life decisions	Paid Access	Page 24

Primary Author, Publication Date	Title	Accessibility, with hyperlink	Document Bookmark
Mills, 2020	Consensus Recommendations on the Prehospital Care of the Injured Athlete With a Suspected Catastrophic Cervical Spine Injury	Free Access	Page 26
Nolan, 2021	European Resuscitation Council and European Society of Intensive Care Medicine guidelines 2021: post-resuscitation care	Free Access	Page 30
Olasveengen, 2021	European Resuscitation Council Guidelines 2021: Basic Life Support	Paid Access	Page 30
Panchal, 2019	2019 American Heart Association Focused Update on Systems of Care: Dispatcher-Assisted Cardiopulmonary Resuscitation and Cardiac Arrest Centers: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care	Free Access	Page 32
Panchal, 2019	2019 American Heart Association Focused Update on Advanced Cardiovascular Life Support: Use of Advanced Airways, Vasopressors, and Extracorporeal Cardiopulmonary Resuscitation During Cardiac Arrest: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care	Free Access	Page 34
Perkins, 2017	European Resuscitation Council Guidelines for Resuscitation: 2017 update	Paid Access	Page 36
Powers, 2019	Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association	Free Access	Page 38
Semeraro, 2021	European Resuscitation Council Guidelines 2021: Systems saving lives	Paid Access	Page 41
Soar, 2021	European Resuscitation Council Guidelines 2021: Adult advanced life support	Paid Access	Page 43
Van de Voorde, 2021	European Resuscitation Council Guidelines 2021: Paediatric Life Support	Paid Access	Page 45
Vanhoy, 2019	Clinical Practice Guideline: Family Presence	Paid Access	Page 47
Williams, 2019	Evidence-Based Guidelines for EMS Administration of Naloxone	Free Access	Page 49
Ziderman, 2021	European Resuscitation Council Guidelines 2021: First aid	Paid Access	Page 52

TITLE

Australian and New Zealand Guideline for Mild to Moderate Head Injuries in Children

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.2. Injury**
 - 1.2.1. Trauma
 - 1.2.3. Traumatic Brain Injuries
- **1.4. Special Clinical Considerations**
 - 1.4.5. Pediatrics

REFERENCE

Babl FE, Tavender E, Ballard DW, Borland ML, Oakley E, Cotterell E, Halkidis L, Goergen S, Davis GA, Perry D, et al. Australian and New Zealand Guideline for Mild to Moderate Head Injuries in Children. *Emerg Med Australas.* 2021;33(2):214-31.

PMID: [33528896](#)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

Objective: Children frequently present with head injuries to acute care settings. Although international paediatric clinical practice guidelines for head injuries exist, they do not address all considerations related to triage, imaging, observation versus admission, transfer, discharge and follow-up of mild to moderate head injuries relevant to the Australian and New Zealand context. The Paediatric Research in Emergency Departments International Collaborative (PREDICT) set out to develop an evidence-based, locally applicable, practical clinical guideline for the care of children with mild to moderate head injuries presenting to acute care settings.

Methods: A multidisciplinary Guideline Working Group (GWG) developed 33 questions in three key areas – triage, imaging and discharge of children with mild to moderate head injuries presenting to acute care settings. We identified existing high-quality guidelines and from these guidelines recommendations were mapped to clinical questions. Updated literature searches were undertaken, and key new evidence identified. Recommendations were created through either adoption, adaptation or development of de novo recommendations. The guideline was revised after a period of public consultation.

Results: The GWG developed 71 recommendations (evidence-informed = 35, consensus-based = 17, practice points = 19), relevant to the Australian and New Zealand setting. The guideline is presented as three documents: (i) a detailed Full Guideline summarising the evidence underlying each recommendation; (ii) a Guideline Summary; and (iii) a clinical Algorithm: Imaging and Observation Decision-making for Children with Head Injuries.

Conclusions: The PREDICT Australian and New Zealand Guideline for Mild to Moderate Head Injuries in Children provides high-level evidence and practical guidance for front line clinicians.

SUMMARY OF GUIDELINE

- Babl et al. coordinated a multidisciplinary guideline working group that developed 33 questions and subsequent recommendations related to the triage, imaging, and discharge of children with mild to moderate head injuries presenting to acute care settings. The working group referenced existing guidelines relevant to these questions as well as an updated literature search through May 2019 using GRADE methodology to inform their recommendations. Where literature was limited, consensus-based recommendations were provided.
- Key recommendations relevant to the prehospital evaluation of children include:
 1. Children with head injury should be assessed in a hospital setting if the mechanism of injury was severe[†] or if they develop the following signs or symptoms within 72 hours of injury:
 - Seizure or convulsion
 - Double vision, ataxia, clumsiness or gait abnormality
 - Loss of consciousness or deteriorating level of consciousness
 - Weakness and tingling in arms or legs
 - Presumed skull fracture (palpable fracture, ‘raccoon eyes’ or Battle’s signs)
 - Vomiting
 - Severe headache
 - Not acting normally, including abnormal drowsiness, increasing agitation, restlessness or combativeness (in children aged less than 2 years, not acting normally as deemed by a parent)
 - Occipital or parietal or temporal scalp hematoma (in children aged less than 2 years)
 - † Severe mechanism of injury is defined as motor vehicle accident with patient ejection, death of another passenger or rollover; pedestrian or bicyclist without helmet struck by motorized vehicle; falls of 1 m or more for children aged less than 2 years, and more than 1.5 m for children aged 2 years or older; or head struck by a high-impact object.
 2. Children with trivial head injury[‡] do not need to attend hospital for assessment; they can be safely managed at home.
 - ‡ Trivial head injury includes ground-level falls, and walking or running into stationary objects, with no loss of consciousness, a GCS score of 15 and no signs or symptoms of head trauma other than abrasions.
 3. In all children presenting with mild to moderate head injury, the possibility of abusive head trauma should be considered.

TITLE

2019 American Heart Association and American Red Cross Focused Update for First Aid: Presyncope: An Update to the American Heart Association and American Red Cross Guidelines for First Aid

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.4. Altered Mental Status
- **1.3. Medical Emergencies**
 - 1.3.3. Neurological

REFERENCE

Charlton NP, Pellegrino JL, Kule A, Slater TM, Epstein JL, Flores GE, Goolsby CA, Orkin AM, Singletary EM, Swain JM. 2019 American Heart Association and American Red Cross Focused Update for First Aid: Presyncope: An Update to the American Heart Association and American Red Cross Guidelines for First Aid. *Circulation*. 2019;140(24):e931-e8.

PMID: [31722559](https://pubmed.ncbi.nlm.nih.gov/31722559/)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

This 2019 focused update to the American Heart Association and American Red Cross first aid guidelines follows the completion of a systematic review of treatments for presyncope of vasovagal or orthostatic origin. This review was commissioned by the International Liaison Committee on Resuscitation and resulted in the development of an international summary statement of the International Liaison Committee on Resuscitation First Aid Task Force Consensus on Science With Treatment Recommendations. This focused update highlights the evidence supporting specific interventions for presyncope of orthostatic or vasovagal origin and recommends the use of physical counterpressure maneuvers. These maneuvers include the contraction of muscles of the body such as the legs, arms, abdomen, or neck, with the goal of elevating blood pressure and alleviating symptoms. Although lower-body counterpressure maneuvers are favored over upper-body counterpressure maneuvers, multiple methods can be beneficial, depending on the situation.

SUMMARY OF GUIDELINE

- This guideline is a focused update on the treatments for presyncope of vasovagal or orthostatic origin from the American Heart Association, based on a review of the literature by the International Liaison Committee on Resuscitation.

- This focused update recommends the use of physical counterpressure maneuvers, including the contraction of muscles of the body such as the legs, arms, abdomen, or neck, with the goal of elevating blood pressure and alleviating symptoms.
- Lower-body counterpressure maneuvers are favored over upper-body counterpressure maneuvers, but multiple methods can be beneficial, depending on the situation.
- Specific new recommendations for 2019 include:
 1. If a person experiences signs or symptoms of presyncope (including pallor, sweating, lightheadedness, visual changes, and weakness) of vasovagal or orthostatic origin, the priority for that person is to maintain or assume a safe position, such as sitting or lying down. Once the person is in a safe position, it can be beneficial for that person to use physical counterpressure maneuvers (PCMs) to avoid syncope (Class 2a; Level of Evidence C-LD).
 2. If a first aid provider recognizes presyncope of suspected vasovagal or orthostatic origin in another individual, it may be reasonable for the first aid provider to encourage that person to perform PCMs until symptoms resolve or syncope occurs. If no improvement occurs within 1 to 2 minutes, or if symptoms worsen or reoccur, providers should initiate a call for additional help (Class 2b; Level of Evidence C-EO).
 3. If there are no extenuating circumstances, lower-body PCMs are preferable to upper body and abdominal PCMs (Class 2b; Level of Evidence C-LD).
 4. The use of PCMs is not suggested when symptoms of a heart attack or stroke accompany presyncope (Class 3: Harm; Level of Evidence C-EO).

TITLE

2019 American Heart Association Focused Update on Pediatric Basic Life Support: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
- **1.4. Special Clinical Considerations**
 - 1.4.5. Pediatrics
- **2.2. EMS Systems**
 - 2.2.3. Delivery Systems with Special Considerations

REFERENCE

Duff JP, Topjian AA, Berg MD, Chan M, Haskell SE, Joyner BL, Jr., Lasa JJ, Ley SJ, Raymond TT, Sutton RM, et al. 2019 American Heart Association Focused Update on Pediatric Basic Life Support: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2019;140(24):e915-e21.

PMID: [31722546](#)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

This 2019 focused update to the American Heart Association pediatric basic life support guidelines follows the 2019 systematic review of the effects of dispatcher-assisted cardiopulmonary resuscitation (DA-CPR) on survival of infants and children with out-of-hospital cardiac arrest. This systematic review and the primary studies identified were analyzed by the Pediatric Task Force of the International Liaison Committee on Resuscitation. It aligns with the International Liaison Committee on Resuscitation's continuous evidence review process, with updates published when the International Liaison Committee on Resuscitation completes a literature review based on new published evidence. This update summarizes the available pediatric evidence supporting DA-CPR and provides treatment recommendations for DA-CPR for pediatric out-of-hospital cardiac arrest. Four new pediatric studies were reviewed. A systematic review of this data identified the association of a significant improvement in the rates of bystander CPR and in survival 1 month after cardiac arrest with DA-CPR. The writing group recommends that emergency medical dispatch centers offer DA-CPR for presumed pediatric cardiac arrest, especially when no bystander CPR is in progress. No recommendation could be made for or against DA-CPR instructions when bystander CPR is already in progress.

SUMMARY OF GUIDELINE

- This guideline from the American Heart Association is a focused update on the effects of dispatcher-assisted cardiopulmonary resuscitation (DA-CPR) on survival of infants and children with out-of-hospital cardiac arrest. It is based on a review of the literature by the International Liaison Committee on Resuscitation.
- The systematic review, which incorporated four new pediatric studies, identified an association between DA-CPR and a significant improvement in the rates of bystander CPR and survival 1 month after cardiac arrest.
- Specific new recommendations for 2019 include:
 1. Recommendation that emergency medical dispatch centers offer DA-CPR instructions for presumed pediatric cardiac arrest (Class 1; Level of Evidence C-LD).
 2. Recommendation that emergency dispatchers provide CPR instructions for pediatric cardiac arrest when no bystander CPR is in progress (Class 1; Level of Evidence C-LD).
 3. No recommendation could be made for or against DA-CPR instructions when bystander CPR is already in progress.

TITLE

2019 American Heart Association Focused Update on Pediatric Advanced Life Support: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
 - 1.1.2. Airway Compromise / Respiratory Failure
- **1.4. Special Clinical Considerations**
 - 1.4.5. Pediatrics

REFERENCE

Duff JP, Topjian AA, Berg MD, Chan M, Haskell SE, Joyner BL, Jr., Lasa JJ, Ley SJ, Raymond TT, Sutton RM, et al. 2019 American Heart Association Focused Update on Pediatric Advanced Life Support: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2019;140(24):e904-e14.

PMID: [31722551](https://pubmed.ncbi.nlm.nih.gov/31722551/)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

This 2019 focused update to the American Heart Association pediatric advanced life support guidelines follows the 2018 and 2019 systematic reviews performed by the Pediatric Life Support Task Force of the International Liaison Committee on Resuscitation. It aligns with the continuous evidence review process of the International Liaison Committee on Resuscitation, with updates published when the International Liaison Committee on Resuscitation completes a literature review based on new published evidence. This update provides the evidence review and treatment recommendations for advanced airway management in pediatric cardiac arrest, extracorporeal cardiopulmonary resuscitation in pediatric cardiac arrest, and pediatric targeted temperature management during post-cardiac arrest care. The writing group analyzed the systematic reviews and the original research published for each of these topics. For airway management, the writing group concluded that it is reasonable to continue bag-mask ventilation (versus attempting an advanced airway such as endotracheal intubation) in patients with out-of-hospital cardiac arrest. When extracorporeal membrane oxygenation protocols and teams are readily available, extracorporeal cardiopulmonary resuscitation should be considered for patients with cardiac diagnoses and in-hospital cardiac arrest. Finally, it is reasonable to use targeted temperature management of 32°C to 34°C followed by 36°C to 37.5°C, or to use targeted temperature management of 36°C to 37.5°C, for

pediatric patients who remain comatose after resuscitation from out-of-hospital cardiac arrest or in-hospital cardiac arrest.

SUMMARY OF GUIDELINE

- This guideline from the American Heart Association is a focused update on the treatment of pediatric cardiac arrest and post-cardiac arrest care. It is based on a continuous evidence evaluation process by the International Liaison Committee on Resuscitation.
- This update focuses on recommendations for advanced airway management in pediatric cardiac arrest, extracorporeal cardiopulmonary resuscitation in pediatric cardiac arrest, and pediatric targeted temperature management during post-cardiac arrest care.
- Key recommendations include:
 1. Bag-valve mask ventilation is reasonable compared with advanced airway interventions (endotracheal intubation or supraglottic airway) in the management of children during cardiac arrest in the out-of-hospital setting (Class 2a; Level of Evidence C-LD).
 2. ECPR may be considered for pediatric patients with cardiac diagnoses who have in-hospital cardiac arrest in settings with existing extra-corporeal membrane oxygenation (ECMO) protocols, expertise, and equipment (Class 2b; Level of Evidence C-LD).
 3. Continuous measurement of core temperature during targeted temperature management (TTM) is recommended (Class 1; Level of Evidence B-NR).
 4. For infants and children between 24 hours and 18 years of age who remain comatose after OHCA or IHCA, it is reasonable to use either TTM 32°C to 34°C followed by TTM 36°C to 37.5°C or to use TTM 36°C.

TITLE

2019 American Heart Association Focused Update on Neonatal Resuscitation: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
- **1.4. Special Clinical Considerations**
 - 1.4.5. Pediatrics

REFERENCE

Escobedo MB, Aziz K, Kapadia VS, Lee HC, Niermeyer S, Schmolzer GM, Szyld E, Weiner GM, Wyckoff MH, Yamada NK, et al. 2019 American Heart Association Focused Update on Neonatal Resuscitation: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2019;140(24):e922-e30.

PMID: [31724451](https://pubmed.ncbi.nlm.nih.gov/31724451/)

ACCESIBILITY

Free Access

PUBLISHED ABSTRACT

This 2019 focused update to the American Heart Association neonatal resuscitation guidelines is based on 2 evidence reviews recently completed under the direction of the International Liaison Committee on Resuscitation Neonatal Life Support Task Force. The International Liaison Committee on Resuscitation Expert Systematic Reviewer and content experts performed comprehensive reviews of the scientific literature on the appropriate initial oxygen concentration for use during neonatal resuscitation in 2 groups: term and late-preterm newborns (≥ 35 weeks of gestation) and preterm newborns (< 35 weeks of gestation). This article summarizes those evidence reviews and presents recommendations. The recommendations for neonatal resuscitation are as follows: In term and late-preterm newborns (≥ 35 weeks of gestation) receiving respiratory support at birth, the initial use of 21% oxygen is reasonable. One hundred percent oxygen should not be used to initiate resuscitation because it is associated with excess mortality. In preterm newborns (< 35 weeks of gestation) receiving respiratory support at birth, it may be reasonable to begin with 21% to 30% oxygen and to base subsequent oxygen titration on oxygen saturation targets. These guidelines require no change in the Neonatal Resuscitation Algorithm—2015 Update.

SUMMARY OF GUIDELINE

- This guideline from the American Heart Association is a focused update on neonatal resuscitation. It is based on 2 evidence reviews completed under the direction of the International Liaison Committee on Resuscitation Neonatal Life Support Task Force.
- This update focuses on recommendations for the appropriate initial oxygen concentration for use during neonatal resuscitation.
- Key recommendations include:
 1. In term and late-preterm newborns (≥ 35 weeks of gestation) receiving respiratory support at birth, the initial use of 21% oxygen is reasonable (Class 2a; Level of Evidence B-R).
 2. One hundred percent oxygen should not be used to initiate resuscitation because it is associated with excess mortality (Class 3: Harm; Level of Evidence B-R).
 3. In preterm newborns (< 35 weeks of gestation) receiving respiratory support at birth, it may be reasonable to begin with 21% to 30% oxygen with subsequent oxygen titration based on pulse oximetry (Class 2b; Level of Evidence C-LD).

TITLE

Consensus statement: a framework for safe and effective intubation by paramedics

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.2. Airway Compromise/Respiratory Failure
- **1.4. Special Clinical Considerations**
 - 1.4.2. Procedures
- **2.3. EMS Personnel**
 - 2.3.2 Education

REFERENCE

Gowens P, Aitken-Fell P, Broughton W, Harris L, Williams J, Younger P, Bywater D, Crookston C, Curatolo L, Edwards T, et al. Consensus statement: a framework for safe and effective intubation by paramedics. *Br Paramed J*. 2018;3(1):23-7.

PMID: [33328802](https://pubmed.ncbi.nlm.nih.gov/33328802/)

ACCESIBILITY

Free Access

PUBLISHED ABSTRACT

This consensus statement provides profession-specific guidance in relation to tracheal intubation by paramedics – a procedure that the College of Paramedics supports.

Tracheal intubation by paramedics has been the subject of professional and legal debate as well as crown investigation. It is therefore timely that the College of Paramedics, through this consensus group, reviews the available evidence and expert opinion in order to prevent patient harm and promote patient safety, clinical effectiveness and professional standards.

It is not the purpose of this consensus statement to remove the skill of tracheal intubation from paramedics. Neither is it intended to debate the efficacy of intubation or the effect on mortality or morbidity, as other formal research studies will answer those questions.

The consensus of this group is that paramedics can perform tracheal intubation safely and effectively. However, a safe, well-governed system of continual training, education and competency must be in place to serve both patients and the paramedics delivering their care.

SUMMARY OF GUIDELINE

- This is a consensus statement from the College of Paramedics in the United Kingdom that based on a review of the available evidence and expert opinion related to the performance of tracheal intubation by paramedics.
- Key findings include:
 1. While the exact number of tracheal intubations required to become proficient is not clear, based on the evidence review, a first-pass intubation success rate of 90% by paramedic students requires more than 25 intubations on patients.
 2. Education and training in tracheal intubation should use a range of modalities including didactic lectures, videos, practical skill stations, and simulation.
 3. There is a paucity of evidence about how paramedics maintain their skill in intubation.
 4. Paramedics should be proficient in the use of a laryngoscope with Magill forceps to facilitate the removal of a foreign body airway obstruction.
 5. Availability of a bougie and use of capnography were considered mandatory minimum standards to be applied routinely by all paramedics performing tracheal intubation.

TITLE

European Resuscitation Council Guidelines 2021: Education for resuscitation

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
- **2.3. EMS Personnel**
 - 2.3.2. Education

REFERENCE

Greif R, Lockey A, Breckwoldt J, Carmona F, Conaghan P, Kuzovlev A, Pflanzl-Knizacek L, Sari F, Shammet S, Scapigliati A, et al. European Resuscitation Council Guidelines 2021: Education for resuscitation. *Resuscitation*. 2021;161:388-407.

PMID: [33773831](https://pubmed.ncbi.nlm.nih.gov/33773831/)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

These European Resuscitation Council education guidelines, are based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations. This section provides guidance to citizens and healthcare professionals with regard to teaching and learning the knowledge, skills and attitudes of resuscitation with the ultimate aim of improving patient survival after cardiac arrest.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding the education of citizens and healthcare professionals with regard to resuscitation from cardiac arrest. The guidance addresses the second key component of the Utstein formula of survival: “educational efficiency.”
- The guideline is based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- Key messages and goals include:
 1. The ERC provides CPR teaching to enable every citizen to provide the basic skills to save a life. This is intended for bystanders, rescuers with a duty to respond, first responders,

EMS dispatchers, healthcare professionals, and children from preschool age to young adults at higher education.

2. Required resuscitation skills are easy to learn and easy to teach. These skills include:
 - Recognizing cardiac arrest, alerting professional rescuers, providing high quality CPR, and using an AED.
 - Advanced resuscitation skills for healthcare providers.
 - Educational competencies to teach resuscitation.
3. Improving basic life support tuition that supports learner adapted programs, technology enhanced learning and feedback devices, and annual short competency refreshers.
4. Healthcare providers should attend advanced life support courses and maintain their certification, to support:
 - Simulation and teaching non-technical skills.
 - Use of cognitive aids.
 - Application of data-driven, performance-focused debriefing.
5. Faculty development that supports teaching programs for BLS-instructors for all levels of providers, for advanced life support courses, and for instructor courses and other educators.

TITLE

Approaching acute pain in emergency settings; European Society for Emergency Medicine (EUSEM) guidelines-part 2: management and recommendations

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.4. Special Clinical Considerations**
 - 1.4.3. *Pain Assessment and Management in the Field*

REFERENCE

Hachimi-Idrissi S, Dobias V, Hautz WE, Leach R, Sauter TC, Sforzi I, Coffey F. Approaching acute pain in emergency settings; European Society for Emergency Medicine (EUSEM) guidelines-part 2: management and recommendations. *Intern Emerg Med.* 2020;15(7):1141-55.

PMID: [32930964](https://pubmed.ncbi.nlm.nih.gov/32930964/)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

Background: In Europe, healthcare systems and education, as well as the clinical care and health outcomes of patients, varies across countries. Likewise, the management of acute events for patients also differs, dependent on the emergency care setting, e.g. pre-hospital or emergency department. There are various barriers to adequate pain management and factors common to both settings including lack of knowledge and training, reluctance to give opioids, and concerns about drug-seeking behaviour or abuse. There is no single current standard of care for the treatment of pain in an emergency, with management based on severity of pain, injury and local protocols. Changing practices, attitudes and behaviour can be difficult, and improvements and interventions should be developed with barriers to pain management and the needs of the individual emergency setting in mind.

Methods: With these principles at the forefront, The European Society for Emergency Medicine (EUSEM) launched a programme—the European Pain Initiative (EPI)—with the aim of providing information, advice, and guidance on acute pain management in emergency settings.

Results and conclusions: This article provides treatment recommendations from recently developed guidelines, based on a review of the literature, current practice across Europe and the clinical expertise of the EPI advisors. The recommendations have been developed, evaluated, and refined for both adults and children (aged ≥ 1 year, ≤ 15 years), with the assumption of timely pain assessment and reassessment and the possibility to implement analgesia. To provide flexibility for use across Europe, options are provided for selection of appropriate pharmacological treatment.

SUMMARY OF GUIDELINE

- This guideline provides recommendations for acute pain management in emergency settings.
- Treatment recommendations were developed based on a review of the literature and clinical expertise of advisors for the European Pain initiative, a program of the European Society for Emergency Medicine (EUSEM).
- Recommendations are presented within two sets of detailed algorithms:
 1. Algorithm for treatment of undifferentiated acute pain in the emergency setting: management of acute pain symptoms in adults.
 2. Algorithm for treatment of undifferentiated acute pain in the emergency setting: management of acute pain symptoms in children (aged ≥ 1 to ≤ 15 years).

TITLE

Non-Auto-Injector Epinephrine Administration by Basic Life Support Providers: A Literature Review and Consensus Process

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **2.3. EMS Personnel**
 - 2.3.1. *Scope of Practice Models*
- **2.4. System Management**
 - 2.4.1. *System Finance*

REFERENCES

Resource Document: Lyng JW, White CCt, Peterson TQ, Lako-Adamson H, Goodloe JM, Dailey MW, Clemency BM, Brown LH. Non-Auto-Injector Epinephrine Administration by Basic Life Support Providers: A Literature Review and Consensus Process. *Prehosp Emerg Care*. 2019;23(6):855-61.

PMID: [30917719](#)

Position Statement: National Association of EMS Physicians. Use of Epinephrine for Out-of-Hospital Treatment of Anaphylaxis. *Prehosp Emerg Care*. 2019;23(4):592.

PMID: [30513053](#)

ACCESIBILITY

Free Access

PUBLISHED ABSTRACT

Anaphylaxis is a life-threatening condition with a known effective prehospital intervention: parenteral epinephrine. The National Association of EMS Physicians (NAEMSP) advocates for emergency medical services (EMS) providers to be allowed to carry and administer epinephrine. Some states constrain epinephrine administration by basic life support (BLS) providers to administration using epinephrine auto-injectors (EAI), but the cost and supply of EAI limits the ability of some EMS agencies to provide epinephrine for anaphylaxis. This literature review and consensus report describes the extant literature and the practical and policy issues related to non-EAI administration of epinephrine for anaphylaxis, and serves as a supplementary resource document for the revised NAEMSP position statement on the use of epinephrine in the out-of-hospital treatment of anaphylaxis, complementing (but not replacing) prior resource documents. The report concludes that there is some evidence that intramuscular injection of epinephrine drawn up from a vial or ampule by appropriately trained EMS providers-without limitation to specific certification levels-is safe, facilitates timely treatment of patients, and reduces costs.

SUMMARY OF GUIDELINE

- This is a resource document describing the evidence evaluation and development of recommendations for the National Association of EMS Physicians (NAEMSP) position statement on non-auto-injector epinephrine administration by basic life support personnel.
- Evidence evaluation and recommendations were provided, leading to the following position statement of NAEMSP:
 1. It is important for all levels of EMS providers to identify patients with anaphylaxis and to recognize the need for prompt initiation of treatment with epinephrine.
 2. The preferred route for administration of epinephrine in the treatment of anaphylaxis is intramuscular.
 3. Epinephrine dosing for anaphylaxis should be consistent with current clinical guidelines.
 4. There is some evidence that intramuscular injection of epinephrine drawn up from a vial or ampule by appropriately trained EMS providers is safe, facilitates timely treatment of patients, and reduces costs.
 5. EMS system medical directors are the decision-making authority regarding whether and how best to provide epinephrine for anaphylaxis. When creating policies and protocols for anaphylaxis treatment, EMS system medical directors should consider local circumstances, including (but not limited to) the incidence of anaphylaxis, system clinical resources, education and training capacity, and opportunity costs.
 6. Epinephrine autoinjectors, ampules, and vials should all be readily available and affordably priced for EMS agencies that elect to use them.
 7. Medical oversight for the administration of epinephrine in anaphylaxis should be based on written protocols or standing orders that permit the administration of epinephrine without requiring prior contact with direct medical oversight.
 8. EMS systems that provide epinephrine for anaphylaxis must do so with medical oversight, must ensure that every provider receives appropriate initial and ongoing training, and must use continuous quality improvement practices to promote the safety and effectiveness of anaphylaxis care.
 9. Further research is necessary to understand the impact out-of-hospital treatments have for patients with anaphylactic reactions and to determine best clinical practices.

TITLE

European Resuscitation Council Guidelines 2021: Newborn resuscitation and support of transition of infants at birth

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
 - 1.1.2. Airway Compromise/Respiratory Failure
- **1.4. Special Clinical Considerations**
 - 1.4.5. Pediatrics

REFERENCE

Madar J, Roehr CC, Ainsworth S, Ersdal H, Morley C, Rudiger M, Skare C, Szczapa T, Te Pas A, Trevisanuto D, et al. European Resuscitation Council Guidelines 2021: Newborn resuscitation and support of transition of infants at birth. *Resuscitation*. 2021;161:291-326.

PMID: [33773829](https://pubmed.ncbi.nlm.nih.gov/33773829/)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

The European Resuscitation Council has produced these newborn life support guidelines, which are based on the International Liaison Committee on Resuscitation (ILCOR) 2020 Consensus on Science and Treatment Recommendations (CoSTR) for Neonatal Life Support. The guidelines cover the management of the term and preterm infant. The topics covered include an algorithm to aid a logical approach to resuscitation of the newborn, factors before delivery, training and education, thermal control, management of the umbilical cord after birth, initial assessment and categorisation of the newborn infant, airway and breathing and circulation support, communication with parents, considerations when withholding and discontinuing support.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding newborn resuscitation and the support of transition of infants at birth.
- The guideline is based on the 2020 International Consensus on Science and Treatment Recommendations for Neonatal Life Support (CoSTR) from the International Liaison Committee on Resuscitation (ILCOR).

- Key messages and goals include:
 1. Delayed cord clamping can optimize patient condition, especially in the preterm infant.
 2. Effective thermal care is vital; dry, wrap, and stimulate the infant.
 3. Assess breathing and heart rate; a fast heart rate indicates adequate oxygenation.
 4. Simple steps to support the airway and breathing manage most problems.
 5. Perform chest compressions only once effective ventilation is established and if the heart rate remains very slow.

TITLE

European Resuscitation Council Guidelines 2021: Ethics of resuscitation and end of life decisions

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
- **1.4. Special Clinical Considerations**
 - 1.4.8. End-of-Life Issues
- **1.5. Special Considerations for Evaluation, Treatment, Transport, and Destinations**
 - 1.5.1. Time-Life Critical Conditions

REFERENCE

Mentzelopoulos SD, Couper K, Voorde PV, Druwe P, Blom M, Perkins GD, Lulic I, Djakow J, Raffay V, Lilja G, et al. European Resuscitation Council Guidelines 2021: Ethics of resuscitation and end of life decisions. *Resuscitation*. 2021;161:408-32.

PMID: [33773832](https://pubmed.ncbi.nlm.nih.gov/33773832/)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

These European Resuscitation Council Ethics guidelines provide evidence-based recommendations for the ethical, routine practice of resuscitation and end-of-life care of adults and children. The guideline primarily focus on major ethical practice interventions (i.e. advance directives, advance care planning, and shared decision making), decision making regarding resuscitation, education, and research. These areas are tightly related to the application of the principles of bioethics in the practice of resuscitation and end-of-life care.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding the ethics of resuscitation and end of life decisions.
- The guideline is based on the consensus of the ERC Ethics Writing Group members.
- Key messages include:
 1. Advanced care plans
 - Help patients and families achieve the outcomes which are important for them.
 - Allow clinicians and patients to participate in shared decision making.

- Should integrate DNACPR decisions with emergency care treatment plans.
2. Educate patients and the public
 - What resuscitation involves and outcomes following resuscitation.
 - About their role in helping clinicians know about the outcomes which are important to them.
 3. Educate healthcare professionals
 - About the importance of advanced care planning.
 - What shared decision making involves
 - How to communicate effectively with patients and their relatives when discussing advanced care plans.
 4. When to start and stop resuscitation
 - Use pre-defined criteria for withholding or terminating CPR.
 - Do not base decisions on isolated clinical signs or markers of poor prognosis.
 - Document reasons for resuscitation decisions.
 5. Research
 - Involve patients and public during the design, conduct, and interpretation of research.
 - Respect the dignity and privacy of research participants.
 - Follow national guidelines for conducting research in an emergency where the person lacks capacity.

TITLE

Consensus Recommendations on the Prehospital Care of the Injured Athlete with a Suspected Catastrophic Cervical Spine Injury

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.2. Injury**
 - 1.2.1. Trauma
- **2.2. EMS Systems**
 - 2.2.3. Delivery Systems with Special Considerations

REFERENCE

Mills BM, Conrick KM, Anderson S, Bailes J, Boden BP, Conway D, Ellis J, Feld F, Grant M, Hainline B, et al. Consensus Recommendations on the Prehospital Care of the Injured Athlete With a Suspected Catastrophic Cervical Spine Injury. *Clin J Sport Med.* 2020;30(4):296-304.

PMID: [32639439](https://pubmed.ncbi.nlm.nih.gov/32639439/)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

Introduction: Sports participation is among the leading causes of catastrophic cervical spine injury (CSI) in the United States. Appropriate prehospital care for athletes with suspected CSIs should be available at all levels of sport. The goal of this project was to develop a set of best-practice recommendations appropriate for athletic trainers, emergency responders, sports medicine and emergency physicians, and others engaged in caring for athletes with suspected CSIs.

Methods: A consensus-driven approach (RAND/UCLA method) in combination with a systematic review of the available literature was used to identify key research questions and develop conclusions and recommendations on the prehospital care of the spine-injured athlete. A diverse panel of experts, including members of the National Athletic Trainers' Association, the National Collegiate Athletic Association, and the Sports Institute at UW Medicine participated in 4 Delphi rounds and a 2-day nominal group technique (NGT) meeting. The systematic review involved 2 independent reviewers and 4 rounds of blinded review.

Results: The Delphi process identified 8 key questions to be answered by the systematic review. The systematic review comprised 1544 studies, 49 of which were included in the final full-text review. Using the results of the systematic review as a shared evidence base, the NGT meeting created and refined conclusions and recommendations until consensus was achieved.

Conclusions: These conclusions and recommendations represent a pragmatic approach, balancing expert experiences and the available scientific evidence.

SUMMARY OF GUIDELINE

- This guideline developed by a group of experts from multiple athletic associations provides recommendations for the prehospital care of the spine-injured athlete.
- The guideline is based on a systematic review of the literature and expert consensus.
- Recommendations are provided to address the following key questions:
 1. What facilities are associated with the best outcomes for an athlete with a suspected CSI?
 2. Are outcomes after CSI likely to be better when face masks are removed before transport?
Are outcomes after CSI likely to be better when the helmet/shoulder pads are removed before transport?
 3. What criteria should be considered when deciding to remove face masks with a suspected CSI? What criteria should be considered when deciding to remove helmet/shoulder pads with a suspected CSI?
 4. What method of transfer and spinal-motion restriction is associated with the best outcomes for athletes with suspected CSI, both in supine and prone position?
 5. What formal training in the emergency care of an athlete with an on-field suspected CSI is required and recommended?
 6. When immobilizing the head and neck, is it better to leave the head in the position in which it is found or apply gentle axial distraction to align the head with the cervical spine?
 7. How many trained personnel does it take to remove a face mask/helmet/shoulder pads on the field?
 8. Once the athlete with a suspected CSI is moved from the field to the ambulance stretcher, should the spinal-motion restriction equipment be removed before transport or on arrival at the emergency department?

TITLE

European Resuscitation Council and European Society of Intensive Care Medicine guidelines 2021: post-resuscitation care

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest

REFERENCE

Nolan JP, Sandroni C, Bottiger BW, Cariou A, Cronberg T, Friberg H, Genbrugge C, Haywood K, Lilja G, Moulaert VRM, et al. European Resuscitation Council and European Society of Intensive Care Medicine guidelines 2021: post-resuscitation care. *Intensive Care Med.* 2021;47(4):369-421.

PMID: [33765189](#)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

The European Resuscitation Council (ERC) and the European Society of Intensive Care Medicine (ESICM) have collaborated to produce these post-resuscitation care guidelines for adults, which are based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations. The topics covered include the post-cardiac arrest syndrome, diagnosis of cause of cardiac arrest, control of oxygenation and ventilation, coronary reperfusion, haemodynamic monitoring and management, control of seizures, temperature control, general intensive care management, prognostication, long-term outcome, rehabilitation and organ donation.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) and the European Society of Intensive Care Medicine (ESICM) provides recommendations regarding post-resuscitation care after cardiac arrest.
- The guideline is based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- Key messages include:
 1. After ROSC use ABC approach
 - Insert an advanced airway (tracheal intubation when skills available).



- Titrate inspired oxygen to an SpO₂ of 94% and ventilate lungs to achieve normocapnia.
 - Obtain reliable intravenous access, restore normovolaemia, avoid hypotension (aim for systolic BP >100 mmHg).
 - Emergent cardiac catheterization +/- immediate PCI after cardiac arrest of suspected cardiac origin and ST-elevation on the ECG.
2. Use targeted temperature management (TTM) for adults after either OHCA or IHCA (with any initial rhythm) who remain unresponsive after ROSC.
 3. Use multimodal neurological prognostication using clinical examination, electrophysiology, biomarkers, and imaging.
 4. Assess physical and non-physical impairments before and after discharge from the hospital and refer for rehabilitation if necessary.

TITLE

European Resuscitation Council Guidelines 2021: Basic Life Support

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
- **2.2. EMS Systems**
 - 2.2.2. Design of System Components
- **2.4. System Management**
 - 2.4.3. Public Health

REFERENCE

Olasveengen TM, Semeraro F, Ristagno G, Castren M, Handley A, Kuzovlev A, Monsieurs KG, Raffay V, Smyth M, Soar J, et al. European Resuscitation Council Guidelines 2021: Basic Life Support. *Resuscitation*. 2021;161:98-114.

PMID: [33773835](https://pubmed.ncbi.nlm.nih.gov/33773835/)

ACCESIBILITY

Paid Access

PUBLISHED ABSTRACT

The European Resuscitation Council has produced these basic life support guidelines, which are based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations. The topics covered include cardiac arrest recognition, alerting emergency services, chest compressions, rescue breaths, automated external defibrillation (AED), CPR quality measurement, new technologies, safety, and foreign body airway obstruction.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding basic life support.
- The guideline is based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- The topics covered include cardiac arrest recognition, alerting emergency services, chest compressions, rescue breaths, automated external defibrillation (AED), CPR quality measurement, new technologies, safety, and foreign body airway obstruction.

- Key messages include:
 1. Recognize cardiac arrest and start CPR.
 2. Alert emergency medical services.
 3. Start chest compressions.
 4. Get an automated external defibrillator (AED).
 5. Learn how to do CPR.

TITLE

2019 American Heart Association Focused Update on Systems of Care: Dispatcher-Assisted Cardiopulmonary Resuscitation and Cardiac Arrest Centers: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
- **2.2. EMS Systems**
 - 2.2.2. Design of System Components

REFERENCE

Panchal AR, Berg KM, Cabanas JG, Kurz MC, Link MS, Del Rios M, Hirsch KG, Chan PS, Hazinski MF, Morley PT, et al. 2019 American Heart Association Focused Update on Systems of Care: Dispatcher-Assisted Cardiopulmonary Resuscitation and Cardiac Arrest Centers: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2019;140(24):e895-e903.

PMID: [31722563](#)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

Survival after out-of-hospital cardiac arrest requires an integrated system of care (chain of survival) between the community elements responding to an event and the healthcare professionals who continue to care for and transport the patient for appropriate interventions. As a result of the dynamic nature of the prehospital setting, coordination and communication can be challenging, and identification of methods to optimize care is essential. This 2019 focused update to the American Heart Association systems of care guidelines summarizes the most recent published evidence for and recommendations on the use of dispatcher-assisted cardiopulmonary resuscitation and cardiac arrest centers. This article includes the revised recommendations that emergency dispatch centers should offer and instruct bystanders in cardiopulmonary resuscitation during out-of-hospital cardiac arrest and that a regionalized approach to post-cardiac arrest care may be reasonable when comprehensive postarrest care is not available at local facilities.

SUMMARY OF GUIDELINE

- This guideline from the American Heart Association is a focused update on dispatcher-assisted cardiopulmonary resuscitation and cardiac arrest centers.

- The guideline is based on evidence reviews completed by the International Liaison Committee on Resuscitation.
- Key recommendations include:
 1. We recommend that emergency dispatch centers offer CPR instructions and empower dispatchers to provide such instructions for adult patients in cardiac arrest (Class 1; Level of Evidence C-LD).
 2. Dispatchers should instruct callers to initiate CPR for adults with suspected OHCA (Class 1; Level of Evidence C-LD).
 3. A regionalized approach to post–cardiac arrest care that includes transport of resuscitated patients directly to specialized CACs is reasonable when comprehensive post–cardiac arrest care is not available at local facilities (Class 2a; Level of Evidence C-LD).

TITLE

2019 American Heart Association Focused Update on Advanced Cardiovascular Life Support: Use of Advanced Airways, Vasopressors, and Extracorporeal Cardiopulmonary Resuscitation During Cardiac Arrest: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest

REFERENCE

Panchal AR, Berg KM, Hirsch KG, Kudenchuk PJ, Del Rios M, Cabanas JG, Link MS, Kurz MC, Chan PS, Morley PT, et al. 2019 American Heart Association Focused Update on Advanced Cardiovascular Life Support: Use of Advanced Airways, Vasopressors, and Extracorporeal Cardiopulmonary Resuscitation During Cardiac Arrest: An Update to the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2019;140(24):e881-e94.

PMID: [31722552](https://pubmed.ncbi.nlm.nih.gov/31722552/)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

The fundamentals of cardiac resuscitation include the immediate provision of high-quality cardiopulmonary resuscitation combined with rapid defibrillation (as appropriate). These mainstays of therapy set the groundwork for other possible interventions such as medications, advanced airways, extracorporeal cardiopulmonary resuscitation, and post-cardiac arrest care, including targeted temperature management, cardiorespiratory support, and percutaneous coronary intervention. Since 2015, an increased number of studies have been published evaluating some of these interventions, requiring a reassessment of their use and impact on survival from cardiac arrest. This 2019 focused update to the American Heart Association advanced cardiovascular life support guidelines summarizes the most recent published evidence for and recommendations on the use of advanced airways, vasopressors, and extracorporeal cardiopulmonary resuscitation during cardiac arrest. It includes revised recommendations for all 3 areas, including the choice of advanced airway devices and strategies during cardiac arrest (eg, bag-mask ventilation, supraglottic airway, or endotracheal intubation), the training and retraining required, the administration of standard-dose epinephrine, and the decisions involved in the application of extracorporeal cardiopulmonary resuscitation and its potential impact on cardiac arrest survival.

SUMMARY OF GUIDELINE

- This guideline from the American Heart Association is a focused update on advanced airways, vasopressors, and extracorporeal cardiopulmonary resuscitation during cardiac arrest.
- The guideline is based on evidence reviews completed by the International Liaison Committee on Resuscitation.
- Key recommendations include:
 1. Either BMV or an advanced airway strategy may be considered during CPR for adult cardiac arrest in any setting (Class 2b; Level of Evidence B-R).
 2. If an advanced airway is used, the SGA can be used for adults with OHCA in settings with low tracheal intubation success rate or minimal training opportunities for ETT placement (Class 2a; Level of Evidence B-R).
 3. If an advanced airway is used, either the SGA or ETT can be used for adults with OHCA in settings with high tracheal intubation success rates or optimal training opportunities for ETT placement (Class 2a; Level of Evidence B-R).
 4. If an advanced airway is used in the in-hospital setting by expert providers trained in these procedures, either the SGA or ETT can be used (Class 2a; Level of Evidence B-R).
 5. Frequent experience or frequent retraining is recommended for providers who perform ETI (Class 1; Level of Evidence B-NR).
 6. Emergency medical services systems that perform prehospital intubation should provide a program of ongoing quality improvement to minimize complications and to track overall SGA and ETT placement success rates (Class 1; Level of Evidence C-EO).
 7. We recommend that epinephrine be administered to patients in cardiac arrest (Class 1; Level of Evidence B-R). On the basis of the protocol used in clinical trials, it is reasonable to administer 1 mg every 3 to 5 minutes (Class 2a; Level of Evidence C-LD).
 8. High-dose epinephrine is not recommended for routine use in cardiac arrest (Class 3: No Benefit; Level of Evidence B-R).
 9. Vasopressin may be considered in a cardiac arrest but offers no advantage as a substitute for epinephrine in cardiac arrest (Class 2b; Level of Evidence C-LD).
 10. Vasopressin in combination with epinephrine may be considered during cardiac arrest but offers no advantage as a substitute for epinephrine alone (Class 2b; Level of Evidence C-LD).
 11. With respect to timing, for cardiac arrest with a nonshockable rhythm, it is reasonable to administer epinephrine as soon as feasible (Class 2a; Level of Evidence C-LD).
 12. With respect to timing, for cardiac arrest with a shockable rhythm, it may be reasonable to administer epinephrine after initial defibrillation attempts have failed (Class 2b; Level of Evidence C-LD).
 13. There is insufficient evidence to recommend the routine use of ECPR for patients with cardiac arrest.
 14. ECPR may be considered for selected patients as rescue therapy when conventional CPR efforts are failing in settings in which it can be expeditiously implemented and supported by skilled providers (Class 2b; Level of Evidence C-LD).

TITLE

European Resuscitation Council Guidelines for Resuscitation: 2017 update

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
- **1.4. Special Clinical Considerations**
 - 1.4.5. Pediatrics

REFERENCE

Perkins GD, Olasveengen TM, Maconochie I, Soar J, Wyllie J, Greif R, Lockey A, Semeraro F, Van de Voorde P, Lott C, et al. European Resuscitation Council Guidelines for Resuscitation: 2017 update. *Resuscitation*. 2018;123:43-50.

PMID: [29233740](https://pubmed.ncbi.nlm.nih.gov/29233740/)

ACCESIBILITY

Paid Access

PUBLISHED ABSTRACT

No abstract available

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding basic life support.
- The guideline is based on the 2017 International Consensus on Science and Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- The topics covered include dispatcher assisted CPR, bystander CPR in adults, EMS-delivered CPR in adults, compression to ventilation ratio, in-hospital adult CPR, bystander pediatric CPR, and neonatal CPR.
- The key change identified in the ERC guidelines compared to prior recommendations relates to neonatal CPR:
 1. **ERC Guideline:** Rescuers who have been taught adult BLS or the chest compression-only sequence and have no specific knowledge of paediatric resuscitation may use this, as the outcome is worse if they do nothing. However, it is better to provide rescue breaths as part of the resuscitation sequence when applied to children as the asphyxial nature of most paediatric cardiac arrests necessitates ventilation as part of effective CPR.



2. ERC Guideline Change: In line with the international COSTR, ERC paediatric guidelines now apply to any one under the age of 18. However, for practical purposes, ERC still advises to use the adult guidelines for anyone who appears to be an adult.

TITLE

Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.3. Medical Emergencies**
 - 1.3.3. *Neurological*
- **2.2. EMS Systems**
 - 2.2.2. *Design of System Components*

REFERENCE

Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, Biller J, Brown M, Demaerschalk BM, Hoh B, et al. Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. 2019;50(12):e344-e418.

PMID: [31662037](https://pubmed.ncbi.nlm.nih.gov/31662037/)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

Background and Purpose: The purpose of these guidelines is to provide an up-to-date comprehensive set of recommendations in a single document for clinicians caring for adult patients with acute arterial ischemic stroke. The intended audiences are prehospital care providers, physicians, allied health professionals, and hospital administrators. These guidelines supersede the 2013 Acute Ischemic Stroke (AIS) Guidelines and are an update of the 2018 AIS Guidelines.

Methods: Members of the writing group were appointed by the American Heart Association (AHA) Stroke Council's Scientific Statements Oversight Committee, representing various areas of medical expertise. Members were not allowed to participate in discussions or to vote on topics relevant to their relations with industry. An update of the 2013 AIS Guidelines was originally published in January 2018. This guideline was approved by the AHA Science Advisory and Coordinating Committee and the AHA Executive Committee. In April 2018, a revision to these guidelines, deleting some recommendations, was published online by the AHA. The writing group was asked review the original document and revise if appropriate. In June 2018, the writing group submitted a document with minor changes and with inclusion of important newly published randomized controlled trials with >100 participants and clinical outcomes at least 90 days after AIS. The document was sent to 14 peer reviewers. The writing group evaluated the peer reviewers' comments and revised when appropriate. The current final document was approved by all members of the writing group except when relationships with industry precluded members from voting

and by the governing bodies of the AHA. These guidelines use the American College of Cardiology/AHA 2015 Class of Recommendations and Level of Evidence and the new AHA guidelines format.

Results: These guidelines detail prehospital care, urgent and emergency evaluation and treatment with intravenous and intra-arterial therapies, and in-hospital management, including secondary prevention measures that are appropriately instituted within the first 2 weeks. The guidelines support the overarching concept of stroke systems of care in both the prehospital and hospital settings.

Conclusions: These guidelines provide general recommendations based on the currently available evidence to guide clinicians caring for adult patients with acute arterial ischemic stroke. In many instances, however, only limited data exist demonstrating the urgent need for continued research on treatment of acute ischemic stroke.

SUMMARY OF GUIDELINE

- This guideline from the American College of Cardiology and the American Heart Association are an update on the management of adult patients with acute arterial ischemic stroke.
- The guideline is based on evidence reviews completed by the International Liaison Committee on Resuscitation.
- Key recommendations for prehospital care include:
 1. Public health leaders, medical professionals, and others should design and implement public education programs focused on stroke systems and the need to seek emergency care (by calling 9-1-1) in a rapid manner. These programs should be sustained over time and designed to reach racially/ethnically, age, and sex diverse populations.
 2. Such educational programs should be designed to specifically target the public, physicians, hospital personnel, and EMS personnel to increase use of the 9-1-1 system, to decrease stroke onset to ED arrival times, and to increase timely use of thrombolysis and thrombectomy.
 3. Activation of the 9-1-1 system is strongly recommended. Dispatchers should make stroke a priority dispatch and transport times should be minimized.
 4. The use of a stroke assessment tool by first aid providers, including EMS dispatch personnel, is recommended.
 5. EMS personnel should provide prehospital notification to the receiving hospital that a suspected stroke patient is en route so that the appropriate hospital resources may be mobilized before patient arrival.
 6. Regional systems of stroke care should be developed. These should consist of facilities that provide initial emergency care, including administration of IV alteplase, and centers capable of performing endovascular stroke treatment with comprehensive periprocedural care to which rapid transport can be arranged when appropriate.
 7. EMS leaders, in coordination with local, regional, and state agencies and in consultation with medical authorities and local experts, should develop triage paradigms and protocols to ensure that patients with a known or suspected stroke are rapidly identified and assessed by use of a validated and standardized tool for stroke screening.
 8. Patients with a positive stroke screen or who are strongly suspected to have a stroke should be transported rapidly to the closest healthcare facilities that are able to administer IV alteplase.



9. When several IV alteplase-capable hospital options exist within a defined geographic region, the benefit of bypassing the closest to bring the patient to one that offers a higher level of stroke care, including mechanical thrombectomy, is uncertain.
10. Effective prehospital procedures to identify patients who are ineligible for IV thrombolysis and have a strong probability of large vessel occlusion stroke should be developed to facilitate rapid transport of patients potentially eligible for thrombectomy to the closest healthcare facilities that are able to perform mechanical thrombectomy.

TITLE

European Resuscitation Council Guidelines 2021: Systems saving lives

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
 - 1.1.2. Airway Compromise/Respiratory Failure
- **2.2. EMS Systems**
 - 2.2.1. Public Safety Answering Points
 - 2.2.2. Design of System Components
- **2.4. System Management**
 - 2.4.3. Public Health
- **3.1. Quality Improvement Principles and Programs**
 - 3.1.2. Quality Improvement Programs

REFERENCE

Semeraro F, Greif R, Bottiger BW, Burkart R, Cimpoesu D, Georgiou M, Yeung J, Lippert F, A SL, Olasveengen TM, et al. European Resuscitation Council Guidelines 2021: Systems saving lives. *Resuscitation*. 2021;161:80-97.

PMID: [33773834](https://pubmed.ncbi.nlm.nih.gov/33773834/)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

The European Resuscitation Council (ERC) has produced these Systems Saving Lives guidelines, which are based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations. The topics covered include chain of survival, measuring performance of resuscitation, social media and smartphones apps for engaging community, European Restart a Heart Day, World Restart a Heart, KIDS SAVE LIVES campaign, lower-resource setting, European Resuscitation Academy and Global Resuscitation Alliance, early warning scores, rapid response systems, and medical emergency team, cardiac arrest centres and role of dispatcher.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding systems of care related to cardiopulmonary resuscitation.

- The guideline is based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- The topics covered include chain of survival, measuring performance of resuscitation, social media and smartphones apps for engaging community, European Restart a Heart Day, World Restart a Heart, KIDS SAVE LIVES campaign, lower-resource setting, European Resuscitation Academy and Global Resuscitation Alliance, early warning scores, rapid response systems, and medical emergency team, cardiac arrest centres and role of dispatcher.
- Key messages include:
 1. Raise awareness about CPR and defibrillation
 - Train as many citizens as possible.
 - Engage with World Restart a Heart Day.
 - Develop new and innovative systems and policies that will save more lives.
 2. Use technology to engage communities
 - Implement technologies to alert first responders to cardiac arrests through smartphone apps / text messages.
 - Develop communities of first responders to help save lives.
 - Map and share the locations of public access. Defibrillators.
 3. Kids save lives
 - Teach all school children to do CPR using “check, call, and compress.”
 - Get children to teach their parents and relatives how to do CPR.
 4. Cardiac arrest centers
 - Where possible, care for adult patients with OHCA in cardiac arrest centers.
 5. Dispatch assistance during CPR
 - Provide telephone assisted CPR for people who are unresponsive with absent or abnormal breathing.
 - Work with dispatch staff to continually monitor and improve telephone assisted CPR.

TITLE

European Resuscitation Council Guidelines 2021: Adult advanced life support

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest

REFERENCE

Soar J, Bottiger BW, Carli P, Couper K, Deakin CD, Djarv T, Lott C, Olasveengen T, Paal P, Pellis T, et al. European Resuscitation Council Guidelines 2021: Adult advanced life support. Resuscitation. 2021;161:115-51.

PMID: [33773825](https://pubmed.ncbi.nlm.nih.gov/33773825/)

ACCESIBILITY

Paid Access

PUBLISHED ABSTRACT

These European Resuscitation Council Advanced Life Support guidelines, are based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations. This section provides guidelines on the prevention of and ALS treatments for both in-hospital cardiac arrest and out-of-hospital cardiac arrest.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding adult advanced life support.
- The guideline is based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- The topics covered include the prevention of and ALS treatments for both in-hospital cardiac arrest and out-of-hospital cardiac arrest.
- Key messages include:
 1. High-quality chest compression with minimal interruption, early defibrillation, and treatment of reversible causes remain the priority.
 2. Premonitory signs and symptoms often occur before cardiac arrest in- or out-of-hospital cardiac arrest is preventable in many patients.
 3. Use a basic or advanced airway technique – only rescuers with a high success rate should use tracheal intubation.



4. Use adrenaline early for non-shockable cardiac arrest.
5. In select patients, if feasible, consider extracorporeal CPR (eCPR) as a rescue therapy when conventional ALS is failing.

TITLE

European Resuscitation Council Guidelines 2021: Paediatric Life Support

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. Cardiac Arrest
 - 1.1.2. Airway Compromise/Respiratory Failure
 - 1.1.3. Hypotension and Shock
 - 1.1.4. Altered Mental Status
- **1.2. Injury**
 - 1.2.1. Trauma
- **1.3. Medical Emergencies**
 - 1.3.1. Respiratory
 - 1.3.3. Neurological
 - 1.3.4. Diabetic Emergencies
- **1.4. Special Clinical Considerations**
 - 1.4.5. Pediatrics

REFERENCE

Van de Voorde P, Turner NM, Djakow J, de Lucas N, Martinez-Mejias A, Biarent D, Bingham R, Brissaud O, Hoffmann F, Johannesdottir GB, et al. European Resuscitation Council Guidelines 2021: Paediatric Life Support. *Resuscitation*. 2021;161:327-87.

PMID: [33773830](https://pubmed.ncbi.nlm.nih.gov/33773830/)

ACCESIBILITY

Paid Access

PUBLISHED ABSTRACT

These European Resuscitation Council Paediatric Life Support (PLS) guidelines are based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations. This section provides guidelines on the management of critically ill infants and children, before, during and after cardiac arrest.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding pediatric life support.

- The guideline is based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- The guideline addresses the management of critically ill infants and children, before, during, and after cardiac arrest.
- Key messages include:
 1. Use ABCDE as common language.
 - Work as a team.
 - Be competent.
 2. Titrate oxygen therapy to SpO₂ 94-98%.
 - Only if impossible to measure, start high flow O₂ based on signs of circulatory/respiratory failure.
 3. In 'shock', give 1 or more fluid bolus(es) of 10 ml/kg of (preferably balanced) crystalloids (or blood products).
 - Reassess after each bolus.
 - Start vasoactive drugs early.
 4. For basic life support, use the specific PBLS algorithm (ABC – 15:2) if you are trained to do so.
 - Both improving the quality of CPR and limiting the hands-off time are considered crucial.
 - Consider provider safety.
 5. For advanced life support, use the specific PALS algorithm.
 - Actively search for and treat reversible causes.
 - Use 2-person BMV as the first line ventilatory support. Only if intubated, provide asynchronous ventilation at an age-dependent rate (10-25/min).

TITLE

Clinical Practice Guideline: Family Presence

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.1. *Cardiac Arrest*
- **1.4. Special Clinical Considerations**
 - 1.4.2. *Procedures*
 - 1.4.8. *End-of-Life Issues*
 - 1.4.9. *Social Issues*
- **1.5. Special Considerations for Evaluation, Treatment, Transport, and Destinations**
 - 1.5.1. *Time-Life Critical Conditions*

REFERENCE

Committee ENACPG. Vanhoy MA, Horigan A, Stapleton SJ, Valdez AM, Bradford JY, Killian M, Reeve NE, Slivinski A, Zaleski ME, et al. Clinical Practice Guideline: Family Presence. *J Emerg Nurs.* 2019;45(1):76 e1- e29.

PMID: [30616766](https://pubmed.ncbi.nlm.nih.gov/30616766/)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

No abstract available

SUMMARY OF GUIDELINE

- This guideline from the Emergency Nurses Association aimed to answer the question: Does family presence have a positive or negative influence on the patient, family, and staff during invasive procedures and resuscitation?
- The guideline is based on a systematic review of multiple databases for studies relevant to family presence during procedures and resuscitation.
- Key recommendations include:
 1. Family member presence during invasive procedures or resuscitation should be offered as an option to family members and should be based on written institution policies (Level A; High).



2. Concerns that family presence is detrimental to the patient, the family, or the healthcare team are not supported by the evidence (Level B; Moderate).
3. Acceptance of family presence may have some cultural basis (Level B; Moderate).
4. Healthcare professionals support the presence of a designated healthcare professional assigned to family members present to provide explanation and comfort (Level B; Moderate).
5. Educating staff in the development, implementation, and evaluation of policy regarding family member presence provides structure and support to healthcare professionals involved in this practice (Level B; Moderate).

TITLE

Evidence-Based Guidelines for EMS Administration of Naloxone

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.3. Medical Emergencies**
 - 1.3.7. *Poisoning/Toxicologic Emergencies*

REFERENCE

Williams K, Lang ES, Panchal AR, Gasper JJ, Taillac P, Gouda J, Lyng JW, Goodloe JM, Hedges M. Evidence-Based Guidelines for EMS Administration of Naloxone. *Prehosp Emerg Care*. 2019:1-15.

PMID: [30924736](https://pubmed.ncbi.nlm.nih.gov/30924736/)

ACCESSIBILITY

Free Access

PUBLISHED ABSTRACT

The opioid crisis is a growing concern for Americans, and it has become the leading cause of injury-related death in the United States. An adjunct to respiratory support that can reduce this high mortality rate is the administration of naloxone by Emergency Medical Services (EMS) practitioners for patients with suspected opioid overdose. However, clear evidence-based guidelines to direct EMS use of naloxone for opioid overdose have not been developed. Leveraging the recent Agency for Healthcare Research and Quality (AHRQ) systematic review on the EMS administration of naloxone for opioid poisonings, federal partners determined the need for a clinical practice guideline for EMS practitioners faced with suspected opioid poisoning. Project funding was provided by the National Highway Traffic Safety Administration, Office of EMS (NHTSA OEMS), and the Health Resources and Services Administration, Maternal and Child Health Bureau's EMS for Children Program (EMSC). The objectives of this project were to develop and disseminate an evidence-based guideline and model protocol for administration of naloxone by EMS practitioners to persons with suspected opioid overdose. We have four recommendations relating to route of administration, all conditional, and all supported by low or very low certainty of evidence. We recommend the intravenous route of administration to facilitate titration of dose, and disfavor the intramuscular route due to difficulty with titration, slower time to clinical effect, and potential exposure to needles. We equally recommend the intranasal and intravenous routes of administration, while noting there are variables which will determine which route is best for each patient. Where we are unable to make recommendations due to evidence limitations (dosing, titration, timing, and transport) we offer technical remarks. Limitations of our work include the introduction of novel synthetic opioids after many of the reviewed papers were produced, which may affect the dose of naloxone required for effect, high risk of bias and imprecision in the reviewed papers, and the introduction of new naloxone administration devices since many of the reviewed papers were published. Future research should be conducted to evaluate new devices and address the introduction of synthetic opioids.

SUMMARY OF GUIDELINE

- A collaboration between the National Association of State EMS Officials (NASEMSO), the National Association of EMS Physicians (NAEMSP), and the American College of Emergency Physicians (ACEP), this guideline aimed to answer several questions relevant to the administration of naloxone by EMS for suspected opioid overdose.
- The guideline is based on a systematic review on the prehospital administration of naloxone for opioid poisonings performed by the Agency for Healthcare Research and Quality (AHRQ).
- The following key questions and recommendations summaries are provided in this guideline:

Pico Questions

Recommendation Summary

1. Routes of administration

For patients with confirmed or suspected opioid overdose, what are the comparative benefits and harms related to out-of-hospital administration of naloxone by EMS personnel using intravenous, intramuscular, subcutaneous, and intranasal routes of administration?

Intranasal (IN) vs. Intramuscular (IM)

- Evidence Quality: Very Low
- Recommendation Strength: Weak/Conditional

Intranasal (IN) vs. Intravenous (IV)

- Evidence Quality: Very Low
- Recommendation Strength: Weak/Conditional

Intravenous (IV) vs Intramuscular (IM)

- Evidence Quality: Very Low
- Recommendation Strength: Weak/Conditional

Intravenous (IV) vs. Subcutaneous (SQ)

- Evidence Quality: Very Low
- Recommendation Strength: Weak/Conditional

1a. Dose of naloxone

For patients with confirmed or suspected opioid overdose who are administered naloxone in the out-of-hospital setting by EMS practitioners, what are the comparative benefits and harms of different intravenous, intramuscular, subcutaneous, or intranasal doses of naloxone?

Comparative data on initial dosing of naloxone is limited. Protocols should be designed based on local data concerning the type and potency of opioids present in the area.

Pico Questions

Recommendation Summary

2. Dose titration of naloxone

For patients with confirmed or suspected opioid overdose in out-of-hospital settings, what are the comparative benefits and harms of titration of naloxone administered by EMS practitioners until the patient resumes sufficient spontaneous respiratory effort versus until the patient regains consciousness?

No articles were identified to answer this question.

The panel recommended administration of the lowest possible dose at the required frequency to maintain adequate respiratory function without triggering a withdrawal phenomenon. The panel did not recommend initially dosing naloxone to achieve full consciousness.

3. Repeat dosing of naloxone

For patients with confirmed or suspected opioid overdose in out-of-hospital settings treated with multiple doses of naloxone (including patients who do not improve after an initial dose of intranasal naloxone), what are the effects on benefits and harms of differences in timing of repeat dosing?

No articles were identified to answer this question.

The panel recommended that repeat dosing should be administered only if there is an inadequate response to initial dosing or with recrudescence of respiratory depression after an initial response.

4. Transport/non-transport

For patients with confirmed or suspected opioid overdose in out-of-hospital settings who regain sufficient spontaneous respiratory effort and are alert and oriented after naloxone administration by EMS personnel, what are the benefits and harms of transporting patients to a health care facility versus non-transport?

The following factors should be considered as reasons to transport the patient to hospital:

1. The patient is at high risk of experiencing reoccurrence of overdose due to substances ingested.
2. There are co-morbid psychiatric or medical conditions that would be better addressed in a hospital setting.
3. EMS practitioners are unable or lack the resources to refer the overdose patient to treatment resources.
4. The hospital has resources for linkage to treatment for overdose patients and/or people who use substances not elsewhere available.

TITLE

European Resuscitation Council Guidelines 2021: First aid

CATEGORY

Evidence-Based Guideline

EMS MEDICINE CORE CONTENT AREA(S)

- **1.1. Time/Life-Critical Conditions**
 - 1.1.2. Airway Compromise/Respiratory Failure
 - 1.1.3. Hypotension and Shock
 - 1.1.4. Altered Mental Status
- **1.2. Injury**
 - 1.2.1. Trauma
 - 1.2.2. Orthopedics
 - 1.2.3. Traumatic Brain Injuries
 - 1.2.5. Environmental
- **1.3. Medical Emergencies**
 - 1.3.1. Respiratory
 - 1.3.3. Neurological
 - 1.3.4. Diabetic Emergencies

REFERENCE

Zideman DA, Singletary EM, Borra V, Cassan P, Cimpoesu CD, De Buck E, Djarv T, Handley AJ, Klaassen B, Meyran D, et al. European Resuscitation Council Guidelines 2021: First aid. *Resuscitation*. 2021;161:270-90.

PMID: [33773828](https://pubmed.ncbi.nlm.nih.gov/33773828/)

ACCESSIBILITY

Paid Access

PUBLISHED ABSTRACT

The European Resuscitation Council has produced these first aid guidelines, which are based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations. The topics include the first aid management of emergency medicine and trauma. For medical emergencies the following content is covered: recovery position, optimal positioning for shock, bronchodilator administration for asthma, recognition of stroke, early aspirin for chest pain, second dose of adrenaline for anaphylaxis, management of hypoglycaemia, oral rehydration solutions for treating exertion-related dehydration, management of heat stroke by cooling, supplemental oxygen in acute stroke, and presyncope. For trauma related emergencies the following topics are covered: control of life-threatening bleeding, management of open chest wounds, cervical spine motion restriction and

stabilisation, recognition of concussion, cooling of thermal burns, dental avulsion, compression wrap for closed extremity joint injuries, straightening an angulated fracture, and eye injury from chemical exposure.

SUMMARY OF GUIDELINE

- This guideline from the European Resuscitation Council (ERC) provides recommendations regarding first aid.
- The guideline is based on the 2020 International Consensus on Cardiopulmonary Resuscitation Science with Treatment Recommendations from the International Liaison Committee on Resuscitation (ILCOR).
- The topics covered include the first aid management of emergency medicine and trauma.
- Key messages include:
 1. Only use the recovery position for casualties who do NOT meet the criteria for the initiation of rescue breathing or chest compressions (CPR).
 2. Use stroke scale assessment protocols for the early recognition of stroke.
 3. When exertional or non-exertional heatstroke is suspected, immediately remove the casualty from the heat source, commence passive cooling and use additional, available cooling techniques.
 4. To control severe life-threatening bleeding, apply direct pressure and consider the use of a haemostatic dressing or the application of a tourniquet.
 5. For thermal burns, remove the casualty from the heat source and commence immediate cooling of the burn with cold or cool water for 20 minutes. Loosely cover the burn with a dry, sterile dressing or cling wrap.