ACADEMY

ON-LINE COURSES

FIRST AID AND CPR

SAINT BERNARD

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Guidelines

1. **Cardiopulmonary resuscitation and emergency cardiovascular care.**
2. **First aid with treatment recommendations.**

Cardiopulmonary resuscitation and emergency cardiovascular care

These guidelines summarize the decisions discussed in several national scientific publications.

These guidelines for cardiopulmonary resuscitation (CPR[1]) and emergency cardiovascular care (ECC[2]) are based on the scientific evidence we have been able to gather and the recommendations resulting from the most recent evaluations of evidence from the International Liaison Committee on Resuscitation (ILCOR[3]).

These guidelines will provide a summary of the recommendations in the official document written by the major organizations. These guidelines form the basis for clinical and pharmacological practice education programs applicable in Canada.

The guidelines for CPR and ECC are based on the ongoing international evidence from ILCOR. The ILCOR evaluation process involves hundreds of international resuscitation scientists and experts who evaluate, discuss and debate thousands of peer-reviewed publications. In this process, ILCOR working groups prioritize topics for review with input from resuscitation. Once a topic is approved for evaluation, a systematic review is commissioned and conducted by a knowledge synthesis unit or systematic reviewer, with input from ILCOR content experts. Once the systematic review is completed, ILCOR working groups review the evidence and develop a draft Consensus on Scientific Recommendations with Treatment (CoSTR[4]) that is posted online for public comment: https://costr.ilcor.org/document

[1] CPR : Cardiopulmonary Resuscitation
[2] ECC : Emergency Cardiovascular Care
[3] ILCOR : International Liaison Committee on Resuscitation
[4] CoSTR : Consensus on Science with Treatment Recommendations

First aid with treatment recommendations

These guidelines summarize the decisions discussed in several national scientific publications. They address the most recent published evidence reviewed by the scientific experts of the First Aid Working Group.

These guidelines have been developed to focus on the science and rationale for recommendations that will lead to changes in first aid training and practice.

The First Aid Working Group of the International Liaison Committee on Resuscitation (ILCOR[5]) is composed of members from around the world. Each of these members has been nominated by each of the ILCOR member organizations. This working group first agreed on the objectives of first aid and produced a definition of first aid as it might apply to the international context. Members of the working group felt that an agreed-upon definition was essential for the further development of research questions, evaluation of evidence and treatment recommendations.

The ILCOR evidence evaluation process and the guideline development process of major jurisdictions are governed by strict disclosure policies designed to make industry relations and other conflicts of interest fully transparent and to protect these processes from undue influence. The Chair of the Guideline Drafting Group and at least 50% of the Guideline Drafting Group members must be free of any conflict of interest. All relevant relationships are disclosed in the Targeted 2020 Update and in all ILCOR CoSTR[6] publications.

These guidelines contain the final wording of CoSTR statements as approved by ILCOR working groups and ILCOR member boards after review and consideration of the evidence and comments posted in response to CoSTR drafts. In this publication, each topic takes into consideration PICOST[7] as well as CoSTR, with an expanded section on rationale and highlights of the evidence to decision framework.

[5] ILCOR : International Liaison Committee on Resuscitation
[6] CoSTR : Consensus on Science with Treatment Recommendations
[7] PICOST: Population, Intervention, Comparator, Outcome, Study design, Time frame

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1 Cardiopulmonary resuscitation and emergency cardiovascular care

1.1 **Adult** Basic Life Support and CPR Quality: **GENERAL PUBLIC**

1.1.1 EARLY INITIATION OF RCR BY UNTRAINED NON-PROFESSIONAL RESCUERS

It is strongly recommended that lay, **untrained first responders initiate CPR maneuvers** for people with confirmed or suspected cardiac arrest. Due to the low risk of harm associated with initiating CPR maneuvers in victims who are not in actual cardiac arrest.

1.1.2 REAL-TIME AUDIOVISUAL FEEDBACK

It may be reasonable to **use real-time audiovisual feedback during CPR**. The use of these resources can optimize CPR performance.

1.1.3 Dispatcher Identification of Agonal Gasps

To help bystanders recognize cardiac arrest, dispatchers should **inquire about a victim's absence of responsiveness and quality of breathing** (normal versus not normal). If the victim is unresponsive with absent or abnormal breathing, the rescuer and the dispatcher should assume that the victim is in cardiac arrest. Dispatchers should be educated to identify unresponsiveness with abnormal and agonal gasps across a range of clinical presentations and descriptions.

1.1.4 Emphasis on Chest Compressions

Untrained lay rescuers should provide compression-only (Hands-Only) CPR[8], with or without dispatcher guidance, for adult victims of cardiac arrest. The rescuer should continue compression-only CPR until the arrival of an AED[9] or rescuers with additional training. All lay rescuers should, at a minimum, provide chest compressions for victims of cardiac arrest. In addition, if the **trained lay rescuer** is able to perform rescue breaths, he or she **should add rescue breaths in a ratio of 30 compressions to 2 breaths**. The rescuer should continue CPR

[8] CPR : Cardiopulmonary Resuscitation
[9] AED : Automated External Defibrillator

until an AED arrives and is ready for use, EMS[10] providers take over care of the victim, or the victim starts to move.

1.1.5 Chest Compression Rate

In adult victims of cardiac arrest, it is reasonable for rescuers to perform **chest compressions at a rate of 100 to 120/min**.

1.1.6 Chest Compression Depth

During manual CPR[11], rescuers should perform **chest compressions to a depth of at least 2 inches (5 cm)** for an average adult, while avoiding excessive chest compression depths (greater than 2.4 inches [6 cm]).

1.1.7 Bystander Naloxone in Opioid-Associated LifeThreatening Emergencies

For patients with known or suspected opioid addiction who are unresponsive with no normal breathing but a pulse, **it is reasonable for appropriately trained lay rescuers and BLS[12] providers, in addition to providing standard BLS care, to administer** intramuscular (IM[13]) or intranasal (IN[14]) **naloxone**. Opioid overdose response education with or without naloxone distribution to persons at risk for opioid overdose in any setting may be considered. This topic is also addressed in the Special Circumstances of Resuscitation section.

1.1.8 DEBRIEFINGS AT THE END OF AN INTERVENTION INVOLVING CPR

Debriefings and **referral sharing for follow-up emotional support** for lay rescuers, inpatient and outpatient healthcare workers after a cardiac arrest event can be beneficial.

[10] EMS : Emergency Medical Services
[11] CPR : Cardiopulmonary Resuscitation
[12] BLS : Basic Life Support
[13] IM : Intramuscular
[14] IN : Intranasal

1.2 Adult Basic Life Support and CPR Quality : **Health Care Provider**

1.2.1 Immediate Recognition and Activation of Emergency Response System

HCP[15]s must call for nearby help upon finding the victim unresponsive, but it would be practical for an HCP to **continue to assess the breathing and pulse simultaneously** before fully activating the emergency response system (or calling for backup).

1.2.2 REAL-TIME AUDIOVISUAL FEEDBACK

It may be reasonable to **use real-time audiovisual feedback during CPR**. The use of these resources can optimize CPR performance.

1.2.3 Emphasis on Chest Compressions

It is reasonable **for HCPs to provide chest compressions and ventilation for all adult patients in cardiac arrest**, whether from a cardiac or noncardiac cause. Moreover, it is realistic for HCPs to tailor the sequence of rescue actions to the most likely cause of arrest.

1.2.4 Shock First vs CPR First

For witnessed adult cardiac arrest when **an AED [16] is immediately available, it is reasonable that the defibrillator be used as soon as possible**. For adults with unmonitored cardiac arrest or for **whom an AED is not immediately available, it is reasonable that CPR[17] be initiated while the defibrillator equipment is being retrieved and applied** and that defibrillation, if indicated, be attempted as soon as the device is ready for use.

1.2.5 Chest Compression Rate: 100 to 120/min

In adult victims of cardiac arrest, it is reasonable for rescuers to perform **chest compressions at a rate of 100 to 120/min.**

1.2.6 Chest Compression Depth

During manual CPR, rescuers should perform chest compressions to **a depth of at least 2 inches (5 cm) for an average adult** while avoiding excessive chest compression depths (greater than 2.4 inches [6 cm]).

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[15] HCP : Health Care Provider
[16] AED : Automated External Defibrillator
[17] CPR : Cardiopulmonary Resuscitation

1.2.7 Chest Recoil

It is reasonable for rescuers to **avoid leaning on the chest between compressions**, to allow full chest wall recoil for adults in cardiac arrest.

1.2.8 Minimizing Interruptions in Chest Compressions

Rescuers should attempt to **minimize the frequency and duration of interruptions in compressions** to maximize the number of compressions delivered per minute.

1.2.9 Chest Compression Feedback

It may be reasonable to use audiovisual feedback devices during CPR for real-time optimization of CPR performance.

1.2.10 Delayed Ventilation

For witnessed OHCA[18] with a shockable rhythm, it may be reasonable for EMS[19] systems with prioritybased, multitiered response to delay positive-pressure ventilation (PPV[20]) by using a strategy of up to 3 cycles of 200 continuous compressions with passive oxygen insufflation and airway adjuncts.

1.2.11 Ventilation During CPR With an Advanced Airway

It may be reasonable for the provider to deliver **1 breath every 6 seconds** (10 breaths per minute) **while continuous chest compressions** are being performed (ie, during CPR[21] **with an advanced airway**).

1.2.12 Mechanical Chest Compression Devices

The evidence does not demonstrate a benefit with the use of mechanical piston devices for chest compressions versus manual chest compressions in patients with cardiac arrest. **Manual chest compressions remain the standard** of care for the treatment of cardiac arrest. However, such a device may be a reasonable alternative to conventional CPR in specific settings where the delivery of high-quality manual compressions may be challenging or dangerous for the provider (eg, limited rescuers available, prolonged CPR, CPR during

[18] OHCA : Out-of-Hospital Cardiac Arrest
[19] EMS : Emergency Medical Services
[20] PPV : Positive-Pressure Ventilation
[21] CPR : Cardiopulmonary Resuscitation

hypothermic cardiac arrest, CPR in a moving ambulance, CPR in the angiography suite, CPR during preparation for ECPR[22]).

1.2.13 Opioid Overdose Treatment

Empirical administration of naloxone intramuscularly or intranasally to all unconscious victims with a life-threatening emergency possibly associated with opioid overdose may be warranted as an adjunct to first aid and SIR protocols administered by lay rescuers.

For patients with known or suspected opioid overdose, in whom a pulse is detected, but who are not breathing normally or who have agonal breathing only (i.e., in respiratory arrest), **it is justified that appropriately trained first responders administer naloxone** intramuscularly or intranasally, in addition to standard care, if they have an opioid-related respiratory emergency. **Respondents should not delay access to more specialized medical services while waiting for the patient to respond to naloxone** or other interventions. Empirical administration of naloxone intramuscularly or intranasally to all unconscious patients with an opioid overdose-related emergency requiring resuscitation may be warranted as an adjunct to standard first aid and SIR protocols administered by lay rescuers. **Standard resuscitation procedures**, including activation of EMS, **should not be delayed by the administration of naloxone.**

1.2.14 CARDIAC ARREST IN PATIENTS WITH KNOWN OR SUSPECTED OPIOID OVERDOSE

Patients in whom **no pulse is detected** may be in cardiac arrest or may have an undetectable slow, weak pulse. These patients should **be managed in the same manner as patients in cardiac arrest.** Standard resuscitation measures should take precedence over naloxone administration, and emphasis should be placed on high-quality CPR (compressions plus insufflation). Intramuscular or intranasal **administration of naloxone** may be warranted, depending on the **possibility that the patient is in respiratory arrest**, not cardiac arrest. Respondents should **not delay access to more specialized medical services** while waiting for the patient to respond to naloxone or other interventions.

1.2.15 Cardiac Arrest in Pregnancy: Provision of CPR

Priorities for the pregnant woman in cardiac arrest are provision of high-quality CPR and relief of aortocaval compression. **If the fundus height is at or above the level of the umbilicus,**

[22]ECPR : Extracorporeal Cardiopulmonary Resuscitation

manual left uterine displacement can be beneficial in relieving aortocaval compression during chest compressions.

1.2.16 DEBRIEFINGS AT THE END OF A CPR INTERVENTION

Debriefings and referral sharing for follow-up emotional support for lay rescuers, inpatient and outpatient healthcare workers after a cardiac arrest event can be beneficial.

1.3 Children and Infant Basic Life Support and CPR Quality

1.3.1 C-A-B Sequence

Although the amount and quality of supporting data are limited, it may be reasonable to maintain the sequence from the 2010 Guidelines by **initiating CPR[23] with chest compressions (C-A-B[24]) over breaths (A-B-C[25])**. Knowledge gaps exist, and specific research is required to examine the best sequence for CPR in children.

CPR must be performed at **a ratio of 30 compressions for 2 breaths when one rescuer and at a ratio of 15 compressions for 2 breaths when two rescuers**.

1.3.2 Chest Compression Depth

It is reasonable that rescuers provide **chest compressions that depress the chest at least one third the anteroposterior diameter of the chest in pediatric patients** (infants [younger than 1 year] to children up to the onset of puberty). This equates to **approximately 1.5 inches (4 cm) in infants to 2 inches (5 cm) in children**. Once children have reached puberty (ie, adolescents), the recommended adult compression depth of at least 2 inches (5 cm) but no greater than 2.4 inches (6 cm) is used.

1.3.3 Chest Compression Rate

To maximize simplicity in CPR training, in the absence of sufficient pediatric evidence, it is reasonable to use the recommended adult **chest compression rate of 100 to 120/min** for infants and children.

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[23] CPR : Cardiopulmonary Resuscitation
[24] C-A-B : Compression, Airway, Breathing
[25] A-B-C : Airway, Breathing, Compression

1.3.4 Compression-Only CPR

Conventional CPR (rescue breaths and chest compressions) should be provided for infants and children in cardiac arrest. The asphyxial nature of **most pediatric cardiac arrests necessitates ventilation as part of effective CPR**. However, because compression-only CPR can be effective in patients with a primary cardiac arrest, if rescuers are unwilling or unable to deliver breaths, we recommend rescuers perform compression-only CPR for infants and children in cardiac arrest.

1.3.5 PEDIATRIC RESPIRATORY ASSISTANCE

For infants and children with a **pulse rate above 60 BPM** but with **absent breathing or insufficient respiratory effort**, it is reasonable to give **1 breath every 2 to 3 seconds** (20-30 breaths / min).

1.3.6 VENTILATORY ASSISTANCE DURING CPR WITH AN ADVANCED AIRWAY PROTECTION DEVICE

When performing CPR in infants and children **with advanced airway protection,** it may be reasonable to target a breathing rate range of **1 breath every 2 to 3 seconds** (20-30 / min), considering age and clinical status. Care should be taken not to exceed these recommendations as too rapid a ventilation rate may compromise the victim's hemodynamics.

1.3.7 OPIOID OVERDOSE

For **children with respiratory arrest**, **artificial respiration or bag mask ventilation** should be **maintained until spontaneous, standard breathing returns**. Measures should continue if spontaneous breathing does not return.

For a **child** with a **suspected opioid overdose**, with a defined **pulse rate greater than 60BPM**, but with **abnormal or gasping respiration** (i.e., respiratory arrest), in addition to **providing ventilatory assistance**, it is reasonable for responders to **administer intramuscular or intranasal naloxone**.

For a **child** with **suspected opioid overdose**, with a **pulse rate of less than 60BPM or no pulse and abnormal or gasping respiration** (i.e. respiratory arrest), in addition to **providing CPR maneuvers,** it is reasonable for providers to **administer intramuscular or intranasal naloxone.**

1.4 Blended Learning Formats

Effective education is an element in improving cardiac arrest survival outcomes. Without the presence of effective education, rescuers and healthcare professionals would have difficulty applying the science behind the basis of cardiac arrest treatment (CPR). **Evidence-based instructional design is essential for rescuers and healthcare professionals to improve their performance and outcomes related to the treatment of cardiopulmonary arrest.**

The use of practice to master the learning of sustained resuscitation techniques throughout training **can enhance skill acquisition. Repetition, practice including a feedback tool and a minimum standard passing grade, greatly promotes mastery of learning and integration.**

Refresher training should be added to traditional course-based learning to help maintain CPR skills.

Multi-session training (i.e., spaced learning) **is preferable to traditional classroom-based training** where the subject matter is taught in a single session, provided that students are able to attend all sessions.

For first responders or healthcare professionals, **self-directed training**, alone or in combination with instructor-led training, **is recommended to improve the willingness and ability to perform CPR**. Greater use of self-directed training can remove a barrier to more extensive CPR training for first responders.

Children of primary and secondary school age should be trained in high-quality CPR.

Virtual reality, which uses a computer interface to create an immersive environment, and game-based learning, which is play and competition with other students, **can be integrated into resuscitation training for first responders and healthcare professionals.**

First responders should receive training on how to respond to victims of opiate overdose, including the administration of naloxone.

The use of play-based learning and virtual reality may be considered for basic or advanced resuscitation training for lay rescuers and/or health care providers.

It is reasonable to increase the willingness of the population to perform CPR with chest compressions only. This can be accomplished by training the population in CPR, increasing CPR awareness initiatives and promoting CPR with chest compressions only.

Self-directed CPR training using video or computer-based modules, combined with hands-on exercises, may be a reasonable alternative to instructor-led courses.

Learning outcomes are more important than the course format. The acquisition and retention of skills and techniques and, ultimately, clinical performance and patient outcomes should guide resuscitation training**. New evidence indicates that specific formats, such as self-directed CPR learning from video or computer-based modules, can produce similar results to instructor-led courses.** The ability to effectively use other course formats is particularly important in resource-limited settings, where the costs of instructor-led training are too high. Self-directed learning offers the potential to train more people in CPR while reducing the costs and resources required for training, important factors when considering the large population of potential rescuers to be trained.

1.5 BLS Retraining Intervals

Given the rapidity with which BLS[26] skills decay after training, coupled with the observed improvement in skill and confidence among students who **train more frequently**, it may be reasonable for BLS retraining **to be completed more frequently** by individuals who are likely to encounter cardiac arrest.

[26] BLS : Basic Life Support

1.6 Cardiopulmonary resuscitation and emergency cardiovascular care **in pandemic time (COVID-19[27])**

It is stated **that chest compressions and cardiopulmonary resuscitation have the potential to generate aerosols**.

It is suggested that **a cloth, towel or piece of clothing be placed over the victim's mouth** and nose to prevent the virus from spreading.

It is suggested that in the current COVID-19 pandemic, **rescuers are considering chest compressions only and public access defibrillation**.

It is suggested that in the current COVID-19 pandemic, rescuers who are willing, trained and able to do so, consider providing rescue breaths to infants and children in addition to chest compressions.

It is suggested that in the current COVID-19 pandemic, health care professionals should use personal protective equipment for procedures that generate aerosols during resuscitation.

It is suggested that it may be reasonable for healthcare providers to consider defibrillation before putting on personal protective equipment for aerosol generating procedures in situations where the provider assesses the benefits may outweigh the risks.

[27] COVID-19 : CoronaVirus December 2019

2 First Aid Science With Treatment Recommendations

2.1 First aid **general**

2.1.1 First Aid Training

Education and training in first aid can be useful to improve morbidity and mortality from injury and illness, and we recommend that it be universally available.

2.1.2 Oxygen Administration for First Aid

There is no evidence supporting the routine administration of supplementary oxygen by first aid providers. Supplementary oxygen may be of benefit in only a few specific situations such as decompression injury and when administered by providers with training in its use.

2.1.3 Optimal Position for Shock

It is suggested that first aid providers **place individuals with shock in the supine position** as opposed to the upright position. In the event of trauma, the rescuer will have to **keep the victim in the found position by maintaining immobilization of the cervical spine while ensuring that his respiratory tract remains clear**. In the event of an airway obstruction, the rescuer should use **the mandibular subluxation technique** to ensure that the cervical spine is maintained.

2.2 AIRWAY CLEARANCE (CHOKING)

2.2.1 CHOKING IN ADULTS AND CHILDREN

Teaching methods involving **abdominal or thoracic thrusts**, back pats, or both can be used. **It is possible to use more than one technique when using choking methods**. In terms of effectiveness, abdominal or thoracic thrusts as well as back slapping are all equivalent techniques in terms of effectiveness.

2.3 Fisrt aid **medical care**

2.3.1 Bronchodilator Use for Asthma with Difficulty Breathing

When an individual with asthma is experiencing difficulty breathing, it is suggested that trained first aid providers assist the individual with administration of a bronchodilator

2.3.2 Stroke Recognition

The use of a stroke assessment system by first aid providers is recommended. Compared with stroke assessment systems that do not require glucose measurement, assessment systems that include glucose measurement have similar sensitivity but higher specificity for recognition of stroke. **The Face, Arm, Speech, Time (FAST[28])** or Cincinnati Prehospital Stroke Scale (CPSS[29]) stroke assessment systems are the simplest of these tools for use by first aid providers, with **high sensitivity for the identification of stroke**.

2.3.3 Hypoglycemia Treatment

For diabetics with mild symptomatic hypoglycemia who are able to follow commands and swallow safely, the use of oral glucose in the form of glucose tablets provides more rapid clinical relief compared with other forms of sugar found in common dietary products. Glucose tablets, if available, should be used to resolve hypoglycemia in these individuals. If glucose tablets are not available, other specifically evaluated forms of foods and liquids containing sugars such as sucrose, fructose, and oligosaccharides can be effective alternatives **for reversal of mild symptomatic hypoglycemia.**

2.3.4 Chest Pain

While waiting for emergency services to arrive, first responders **can encourage alert adults with non-traumatic chest pain to chew and swallow aspirin (160-325mg) unless** the person with pain has a **known allergy to aspirin or has been advised by a health care provider not to take aspirin.**

[28] FAST : Face, Arm, Speech, Time
[29] CPSS : Cincinnati Prehospital Stroke Scale

2.3.5 Anaphylaxis

When a person with anaphylaxis does not respond to an initial dose of epinephrine, and arrival of advanced care will exceed 5 to 10 minutes, a repeat dose may be considered.

2.4 First aid **traumatic care**

2.4.1 Positioning an Ill or Injured Person

The recommended recovery position has changed from supine to a lateral side-lying position for patients without suspected spine, hip, or pelvis injury. There is little evidence to suggest that any alternative recovery position is of greater benefit for an individual who is unresponsive and breathing normally.

2.4.2 Control of Bleeding

It is suggested that **localized cold therapy** with or without pressure may be beneficial in hemostasis **for closed bleeding in extremities**.

2.4.3 Hemostatic Dressings

First aid responders may consider the **use of hemostatic dressings when standard measures to control bleeding** (by applying direct pressure with or without gauze or tissue bandaging) **are not effective for severe or life-threatening bleeding.**

2.4.4 Use of a Tourniquet

A military-type (commercial) tourniquet should be used as first-line therapy for limb hemorrhages involving life-threatening bleeding and should be placed as soon as possible after the injury.

If a military-type (commercial) tourniquet is not immediately available, or if a properly applied makeshift tourniquet fails to stop the bleeding, direct manual pressure, with the use of a hemostatic dressing if available, should be used to treat life-threatening bleeding from the extremities.

For persons with life-threatening external bleeding, direct manual pressure should be applied to achieve initial cessation of bleeding for injuries that do not lend themselves to a

military (commercial) tourniquet or when a makeshift tourniquet is not immediately available.

If a haemostatic dressing is available, it may be useful as adjunctive therapy to direct manual pressure for the treatment of life-threatening external haemorrhage.

2.4.5 Spinal Motion Restriction

With a growing body of evidence showing harm and no good evidence showing clear benefit, **routine application of cervical collars by first aid providers is not recommended**. A first aid provider who suspects a spinal injury **should have the injured person remain as still as possible** while awaiting arrival of EMS providers.

2.4.6 Treatment of Open Chest Wounds

A first aid provider caring for an individual with an open chest wound may leave the wound open. If a dressing and direct pressure are required to stop bleeding, care must be taken to ensure that a blood-saturated dressing does not inadvertently become occlusive.

2.4.7 Concussion

An HCP should evaluate any person with a head injury that has resulted in a change in level of consciousness, progressive development of signs or symptoms of concussion, or other causes for concern to the first aid provider. The evaluation should occur as soon as possible.

2.4.8 Cervical Spinal Motion Restriction

The studies suggests taht they are against the use of cervical collars by first aid providers.

2.4.9 Dental Avulsion

First aid providers may be unable to reimplant an avulsed tooth due to lack of protective medical gloves, training and skill, or fear of causing pain. When immediate reimplantation is not possible, it may be beneficial to temporarily store an avulsed tooth in a solution shown to prolong viability of dental cells (compared with saliva). Solutions with demonstrated efficacy at prolonging dental cell viability from 30 to 120 minutes include Hank's Balanced Salt Solution (containing calcium, potassium chloride and phosphate, magnesium chloride and sulfate, sodium chloride, sodium bicarbonate, sodium phosphate dibasic, and glucose), propolis, egg white, coconut water, Ricetral, or whole milk.

2.4.10 Eye Chemical Injury: Irrigation

In making this recommendation, we value the preservation of vision.

We recommend that the **local poison center be called** to assist with identification of any chemical involved in an ocular injury. Because of the dangers associated with chemical eye injuries, a healthcare professional should **evaluate these injuries immediately**.

It is recommend that **continuous irrigation of corneal injuries caused by alkaline substances with clean or tap water** and to continue until a healthcare professional evaluates the injury and determines that the pH[30] of the eye has returned to normal.

2.4.11 Cooling of Burns

It is recommend that first aid providers actively cool thermal burns.

In these recommendations, they place higher value on decreased burn depth over the potential risk of infection or hypothermia.

Method/temperature of cooling: Forms of active cooling evaluated in this review included cool/cold nonfreezing water and mechanical devices (eg, cold probes, cooled gel pads), but there is no evidence to recommend a specific temperature or method of cooling.

It is recommanded that suggests that active cooling should take place as soon as possible for a minimum of 10 minutes.

2.4.12 Wet Compared With Dry Burn Dressings

There is insufficient evidence to show any benefits of wet compared with dry dressings applied to thermal burns in the prehospital setting.

2.4.13 Cooling Techniques for Hyperthermia and Heat Stroke

For adults and children **suffering from hyperthermia** on exertion **or heat stroke**, rescuers must **remove the person from the hot environment, remove excess clothing, limit the effort** and activate emergency services.

For adults suffering from exercise-induced hyperthermia or heat stroke, it is reasonable to immediately initiate active cooling using whole-body (lying) immersion techniques in cold water (1°C to 26°C [33.8°F to 78.8°F]), when safe to do so, until body temperature is below 39°C (102.2°F) or neurological symptoms disappear.

[30] pH : Potential for Hydrogen

For adults with hyperthermia or heat stroke, it may be reasonable to use other forms of active cooling, including commercial ice packs, cold showers, ice packs and towels, cooling vests and jackets, evaporation, ventilation, or a combination of techniques when immersion in water is not possible.

For children with exercise-induced hyperthermia or heat stroke, it may be reasonable to immediately initiate active cooling using whole body (lying) immersion techniques in cold water (1°C to 26°C [33.8°F to 78.8°F]), when safe to do so, until core body temperature is below 39°C (102.2°F) or neurological symptoms resolve.

For children with hyperthermia or heat stroke, it may be reasonable to provide other forms of active cooling, including commercial ice packs, cold showers, ice packs and towels, cooling vests and jackets, evaporation, ventilation or a suit when immersion in water is not possible.

3 REFERENCES

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3.9 2020 Highlights - Guidelines for CPR & ECC

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