

2016 Canadian Consensus Guidelines on First Aid and CPR



The Canadian Guidelines Consensus Task Force was established in 2015 and comprises Heart and Stroke Foundation, Canadian Red Cross, St. John Ambulance, Lifesaving Society, and Canadian Ski Patrol. The Canadian Guidelines Consensus Task Force was constituted to review the consensus on science completed by the International Federation of Red Cross/ Red Crescent (IFRC) and the International Liaison Committee on Resuscitation (ILCOR) in 2015.

This document reflects the Task Force’s collaborative discussion and interpretation of the new science and best practice recommendations as applicable to first aid and resuscitation training. Its intent is to build consensus on guideline changes for adoption across Canada in an effort to ensure current training practises and standards are accessible and will be used by each agency to develop materials and Instructor updates. Some agencies may release bridging materials as an interim measure until the final products are available. The new guidelines are not a suggestion that old methods are ineffective, incorrect, or dangerous, but reflect new techniques and approaches with proven benefits and improved outcomes.

The tables below highlight First Aid & Resuscitation guideline changes for Canada.

Principles

Topic	2016 Canadian Consensus	Rationale
Chain of Survival	<ul style="list-style-type: none"> • Training should be tailored to the audience to provide the best level of care and outcomes. • Lay rescuers should continue to use the current chain of survival. • When training is being provided to in-hospital/in-facility providers the In-Hospital Chain of Survival should be emphasized. 	<ul style="list-style-type: none"> • A person experiencing an Out of Hospital Cardiac Arrest (OHCA) is dependent on their community for support. Lay rescuers must recognize the arrest, call for help, and initiate CPR and provide defibrillation until professional rescuers respond. • A person experiencing an In-Hospital Cardiac Arrest (IHCA) depends on the system of appropriate surveillance to prevent cardiac arrest, and then the smooth interaction of the various departments of the hospital to respond when a cardiac arrest occurs.
Mobile Phones	<ul style="list-style-type: none"> • Training should emphasize on the use of mobile technologies to call 9-1-1 sooner and receiving dispatch-assisted CPR instructions. • Bystanders should use mobile phones to immediately call 9-1-1, placing phones on speaker mode, so the dispatcher can 	<ul style="list-style-type: none"> • When available use of a mobile phone to activate the Emergency Response System may decrease delays in response time. • Use of a mobile phone, with a speaker mode, may enhance rescuer effectiveness through supportive communication with dispatch (e.g. dispatch-assisted CPR).

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	<p>help bystanders check for breathing, get the precise location and provide instructions for performing CPR.</p> <ul style="list-style-type: none"> Mobile-technology and social media applications that notify rescuers of a nearby cardiac arrest may increase the rate of bystander-initiated CPR. 	
Chest Compression Fraction as a percentage of care activities	<ul style="list-style-type: none"> Interruptions in chest compressions should be minimized. A target should be to perform chest compressions a minimum of 60% of the total resuscitation time. <p>Special Considerations 2016</p> <ul style="list-style-type: none"> In multi-rescuer scenarios with a high performance team chest compression should be performed a minimum of 80% of the total resuscitation time. 	<ul style="list-style-type: none"> Chest compression fraction is a measurement of the proportion of total resuscitation time that compressions are performed. Interruptions in chest compressions can be intended (ventilations, AED analysis, etc.) as part of required care or unintended (rescuer distraction).
HCP Team Approach	<ul style="list-style-type: none"> When multiple trained rescuers are available, it is recommended that a team approach with clear pre-assigned roles is implemented.ⁱ 	<ul style="list-style-type: none"> Integrated teams of highly trained rescuers may use a choreographed approach that accomplishes multiple steps and assessments simultaneously rather than the sequential manner used by individual rescuers (e.g., one rescuer activates the emergency response system while another begins chest compressions, a third either provides ventilation or retrieves the bag-mask device for rescue breaths, and a fourth retrieves and sets up a defibrillator).

Changes to First Aid Knowledge, Skills and Practice

Topic	Pre- 2016 Practice	2016 Canadian Consensus	Rationale
Anaphylaxis	First aid providers will continue to be taught the signs and symptoms and	A person with symptoms of anaphylaxis, treated with epinephrine, may be given a second dose if the first dose is not effective after 5	A person suffering an anaphylactic reaction may require a second dose of epinephrine if the first dose is not effective in

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	how to assist with auto injectors but will be taught to seek medical advice before helping with a second injection.	minutes.	relieving symptoms.
Aspirin & Chest Pain		A person experiencing chest pain, believed to be cardiac in origin, should chew 1 adult or 2 low-dose aspirins while waiting for health-care professional assistance to arrive, unless there is a contraindication, such as an allergy or bleeding disorder. ⁱⁱ	<ul style="list-style-type: none"> • One of the most important considerations is heart attack, which usually is caused by atherosclerosis acutely complicated by thrombosis (blood clot) in the heart vessels. Therefore, antithrombotic treatment is desirable as soon as possible. • Prehospital administration of aspirin is safe and effective in early reperfusion in acute myocardial infarction.
Bleeding	In delayed care situations, when direct pressure is not effective to control massive bleeding, properly trained persons should apply a tourniquet.	<ul style="list-style-type: none"> • First aid providers must control external bleeding by applying direct pressure. • The use of a tourniquet should be considered for life-threatening external limb bleeding that is not controlled by direct pressure, or for circumstances such as wound inaccessibility, multiple injuries, multiple people/disaster setting, remote locations. 	Because the rate of complications is low and the rate of hemostasis is high, first aid providers should consider the use of a tourniquet when standard first aid hemorrhage control does not control severe external limb bleeding.
Concussion	Signs and symptoms of concussion are discussed in classrooms and included in reference materials.	A person who has experienced a blow to the head, consistent with concussion, should be encouraged to discontinue activity (sport or other recreational activity) and seek medical aid.	<ul style="list-style-type: none"> • Head injuries can range from: severe with loss of consciousness, brief with loss of consciousness, to those without loss of consciousness. • Due to the complexity of signs and symptoms, first aid providers can find the recognition of concussion difficult, resulting in the delay in receiving proper concussion management and post-concussion advice and treatment.

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Conscious Choking	There is no change to this guideline from 2010.	Teaching methodologies that support back-blows, abdominal or chest thrusts or a combination may be employed. More than one technique is usually required, all techniques are equally effective.	<ul style="list-style-type: none"> There is no evidence for improved outcomes between back-blows/abdominal or chest thrusts, all techniques are equally effective. Each method of choking relief has proven to be effective. Selection of one technique over the other, or a combination of techniques is acceptable.ⁱⁱⁱ
Dental Avulsion	<ul style="list-style-type: none"> Control any bleeding by having the person bite down on a sterile or clean dressing. Carefully pick up the tooth by the crown (the white part), not the root. Gently rinse off the tooth in water. Do not scrub it or remove any tissue fragments that are attached. Put the tooth in milk, if available, or in water and keep it with the person. If there is no milk or water, wrap the tooth in a clean cloth or gauze with some of the person's own saliva. Seal the container with tape and label it with the name of the person, date, and time. 	<ul style="list-style-type: none"> First aid providers who are not trained to re-implant an avulsed tooth should transport the person and tooth to a first aid provider capable of re-implanting the tooth or a dentist as rapidly as possible. The avulsed tooth should be held at the crown, not the root. Do not clean the avulsed tooth, as this could damage tissues. The avulsed tooth may be placed in a balanced salt solution. If not available the tooth may be placed in propolis, egg white, coconut water, ricetral, whole milk, saline or phosphate buffered saline (in order of preference). If none of these solutions is available it may be reasonable to store an avulsed tooth in the injured person's saliva (not in the mouth). 	<ul style="list-style-type: none"> A tooth will have the greatest chance of survival if it is replanted immediately. However many first aid providers do not have the skills for this procedure. The first aid provider should bring the person and the avulsed tooth to first aid provider or dentist who can accomplish the procedure. Based on evidence alone, it is not possible to determine which solution is best. However based on the evidence evaluated, availability and feasibility, following solutions in order of preference, could be used for temporary storage of an avulsed tooth: balanced salt solution, propolis, egg white, coconut water, ricetral, whole milk, saline, Phosphate Buffered Saline. Some of these solutions might not be available, and thus the choice of the storage solution can be made based upon availability.
Fractures	First Aid providers should protect the injured person, which may include splinting in a way that limits pain, reduces the chance for further injury-where ever possible in the position	<ul style="list-style-type: none"> First aid providers should assume an injury to an extremity can include a potential bone fracture and manually stabilize the injured extremity in situ. Cold treatments should not be applied for longer than 20 minutes.^{iv} 	<ul style="list-style-type: none"> The goals of first aid in situations of extremity fractures are: to preserve the extremity, to limit pain and bleeding and to seek further medical assistance. To prevent cold injury to the skin and superficial nerves, the application of ice is best limited to periods of less than

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	<p>found- and facilitates safe and prompt transport. If an injured extremity is blue or extremely pale, activate EMS immediately.</p>	<ul style="list-style-type: none"> Based on training and circumstance, first aid providers may need to move an injured limb or person. In such situations, providers should protect the injured person, which may include splinting in a way that limits pain, reduces the chances for further injury, and facilitates safe and prompt transport. <p>Special Considerations</p> <ul style="list-style-type: none"> In remote situations, wilderness environments or special circumstances with a cool and pale extremity, it may be appropriate for specially trained first aid providers to straighten an angulated fracture 	<p>20 minutes at a time with a protective barrier.</p> <p>Special Consideration Rationale</p> <ul style="list-style-type: none"> For remote situations, wilderness environments or special circumstances with a cool and pale extremity, it may be necessary for specially trained first aid providers to straighten an angulated fracture
Frostbite	<ul style="list-style-type: none"> Remove the person from the cold environment. Ensure ABCs are present. Perform secondary survey and treat any non-life-threatening conditions. Warm the affected area gradually using warm water or body heat. Don't break any blisters! Protect them with loose, dry dressings. Place gauze between the fingers or toes if they are affected. If you suspect the person may have frostbite, seek medical attention. 	<ul style="list-style-type: none"> When providing first aid to a person with frostbite, re-warming of frozen body parts could be done only if there is no risk of refreezing. Re-warming should be achieved by immersing the affected part in water between 37° Celsius (body temperature) and 40° Celsius (98.6° Fahrenheit and 104° Fahrenheit) for 20-30 minutes. For severe frostbite, re-warming should be accomplished within 24 hours. Chemical warmers should not be placed directly on frostbitten tissue, because they can reach temperatures that can cause burn and exceed the targeted temperatures. After re-warming, protect frostbitten parts from re-freezing and quickly transport the person for further care. Affected body parts may be dressed with sterile gauze and gauze placed between digits until the person can reach medical care. 	<ul style="list-style-type: none"> Scientific review showed that rapid re-warming with water baths between 37° C and 42° C for 20-30 minutes improved outcomes and reduction in tissue loss. Studies of chemical heat-generating devices for hand and foot warming generated temperatures significantly above this range (69° C to 74° C). Two cases indicated caution as to the danger of re-freezing once warmed.
Hypoglycemia		<ul style="list-style-type: none"> Glucose tablets should be used for treating symptomatic 	<ul style="list-style-type: none"> Recognizing hypoglycemia is most important because the

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Topic	Pre- 2016 Practice	2016 Canadian Consensus	Rationale
		<p>hypoglycemia in conscious individuals.</p> <ul style="list-style-type: none"> • Administration of glucose may be repeated if symptoms persist after 10 minutes . • If glucose tablets are not available, other types of dietary sugars recommended (in order of preference): Glucose candy (Mentos), Sucrose candy (Skittles), Jelly beans, Orange Juice, Fructose (fruit leather), whole milk. 	<p>person requires rapid treatment. For adults, 15 to 20 grams of sugars or carbohydrates are needed to raise blood glucose levels in people with diabetes experiencing hypoglycemia. There is a 10-15 minute delay between ingesting sugar for hypoglycemia and the return of blood glucose levels and improvement of symptoms.</p> <ul style="list-style-type: none"> • Glucose tablets are the preferred treatment for hypoglycemia where the person is awake, able to respond and swallow. Less effective but acceptable forms of sugars can also be used in the absence of glucose tablets.
Open Chest wounds	Apply an occlusive dressing over all open chest wounds.	<ul style="list-style-type: none"> • For open chest wounds, first aid providers may leave the wound exposed or a non-occlusive-type dressing may be applied, but saturation must be avoided. • If a dressing becomes saturated, it must be changed. • If there is significant external bleeding, direct pressure to the chest wound with a hand and/or a non-occlusive dressing should be applied. 	<ul style="list-style-type: none"> • The published literature indicates the importance of correct management of an open chest wound. In the training the avoidance of an occlusive dressing has to be stressed to prevent the development of a potential life-threatening complication of tension pneumothorax. Previously the standard treatment for a sucking chest wound was to place a three sided occlusive dressing on the chest. If an open chest wound has an occlusive dressing applied, or if a non-occlusive dressing becomes saturated with blood and inadvertently becomes occlusive, it may cause air to build up between the chest wall and the lung, leading to life-threatening tension pneumothorax.
Oxygen	The use of supplementary Oxygen by first aid providers is reasonable for anyone experiencing dyspnea or signs of hypoxemia.	<ul style="list-style-type: none"> • Administration of supplementary oxygen is recommended to maintain oxygen saturation greater than 94%. • Supplementary oxygen should not be administered without the measurement of SpO₂ via pulse oximetry, indicating oxygen saturation of less than 94%. • The use of supplementary oxygen if indicated should be limited to first aider providers with specific training in oxygen administration. 	<ul style="list-style-type: none"> • Measurement of oxygen saturation is essential in assessing the need for oxygen supplementation. Education in interpreting oxygen saturation through pulse oximetry is required. • Limited evidence exists for or against routine administration of supplementary oxygen by first aid providers. Supplemental oxygen resulting in hyperoxemia (SpO₂ greater than 94%) in persons with STEMI appears to

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		<ul style="list-style-type: none"> • Exceptions: <ul style="list-style-type: none"> ○ Giving supplementary oxygen by a specifically trained first aider is reasonable for first aid in scuba divers with a decompression injury and asphyxia (e.g. drowning). ○ Giving supplementary oxygen by a specifically trained first aider for persons with advanced cancer having dyspnea and hypoxaemia may be reasonable. ○ Giving supplementary oxygen by a specifically trained first aid provider might be useful as soon as possible for breathing persons after carbonic monoxide exposition until emergency medical care is available. 	<p>increase myocardial injury and myocardial infarct size. However, hypoxemia is also associated with worse outcomes.</p> <ul style="list-style-type: none"> • Providing oxygen for relief of decompression sickness is supported by evidence.
Positioning an unresponsive Person	Place person into a recovery position; if there was any suspicions of spinal injury a HAINES recovery was to be utilized.	<ul style="list-style-type: none"> • First aid providers should position individuals who are unresponsive and breathing normally into a lateral, side-lying recovery position as opposed to leaving them supine. • The HAINES recovery position is no longer supported. 	<ul style="list-style-type: none"> • Evidence indicated there is improvement to respiratory indices when the ill or injured person is in a lateral position compared with a supine position, for persons without suspected spine, hip or pelvis injury. • The HAINES position is no longer recommended, due to the lack of and very low quality of evidence to support this position.
Spinal Motion Restriction	First Aid providers should not use immobilization devices because their benefit has not been proven.	<ul style="list-style-type: none"> • For first aid providers, the routine application of cervical collars is not recommended. • In a suspected cervical spine injury, it is recommended to manually support the person's head in a position limiting angular movement until more advanced care arrives. <p>Special Consideration(s)</p> <ul style="list-style-type: none"> • In special circumstances, traditional immobilization devices may be used for extrication. 	<ul style="list-style-type: none"> • Since incorrect application of a cervical collar could result in further injury, and since evidence is available to adverse events (e.g. raised intracranial pressure) when applying such collar, it is decided not to recommend routine application of a cervical collar by a lay person first aid provider. Correct application would require training, regular practice and the ability of the first aid provider to distinguish between high risk and low risk injuries.
Wounds and	<ul style="list-style-type: none"> • Wash the wound thoroughly with 	<ul style="list-style-type: none"> • Superficial wounds and abrasions should be irrigated with 	<ul style="list-style-type: none"> • There is strong evidence that wound irrigation using clean,

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Abrasions	<p>soap and water.</p> <ul style="list-style-type: none"> • If possible, rinse the wound for five minutes with clean, running tap water. • If an antibiotic ointment or cream is available, put it on the wound as recommended by a pharmacist after checking the Five Rights of Medication. Ask the person if she or he has sensitivity to any antibiotics, such as penicillin. If so, do not apply the ointment. 	<p>clean water, preferably tap water because of the benefit of pressure.</p> <ul style="list-style-type: none"> • First aid providers may apply antibiotic ointment to skin abrasions and wounds to promote faster healing with less risk of infection. • First aid providers may apply an occlusive dressing to wounds (excluding open chest wounds) and abrasions with or without antibiotic ointment. • Persons with wounds that develop redness, warmth or become painful; or persons with wounds who develop fever should seek medical attention. 	<p>running tap water is at least as effective as wound irrigation with normal saline and may be better. Studies have shown that using running tap water versus normal saline was more effective in improving wound healing and lowering infection.</p> <ul style="list-style-type: none"> • One clinical trial demonstrated no benefit from soap and water applied to an open wound. Several studies demonstrated possible toxicity to cells when exposed directly to soap and water. However, there is support for using soap and water for decreasing skin bacterial counts when applied to closed wounds. • Studies also compared the effectiveness of triple antibiotic ointment with that of single antibiotic ointment or no ointment at all. Results showed triple antibiotic ointment treatment healed wounds significantly faster and with lower infection rate than those treated with either single ointment or no ointment. Both triple and single antibiotic ointments were superior to no treatment in promoting healing of contaminated blisters.
Stroke		<ul style="list-style-type: none"> • Use of a stroke assessment system, such as FAST should be employed. <ul style="list-style-type: none"> ○ Face, Arms, Speech, Time • First Aid providers should note the time of stroke symptoms/signs onset. • First aid providers should be encouraged to seek immediate medical attention for persons who have experienced a stroke. 	<ul style="list-style-type: none"> • Stroke is a medical emergency requiring immediate medical attention. The goal is for a person to receive definitive treatment as soon as possible (ideally in under 3 hours from onset of stroke symptoms).

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Changes to Resuscitation Knowledge, Skills and Practice

Topic	Pre- 2016 Practice	2016 Canadian Consensus	Rationale
Chest Compression Depth - Adult	The adult sternum should be depressed at least 5 cm.	<ul style="list-style-type: none"> First aid providers should compress the chest at least 5 centimetres for an average adult. Compression depths exceeding 6 centimetres should be avoided. 	<ul style="list-style-type: none"> A single small study found that compression depths exceeding 6 centimetres in an adult may be associated with increased rates of non-life threatening injury when compared with compression depths of 5 to 6 centimetres.
Chest Compression Depth - Child	First aid providers should compress the chest at least one third the anteroposterior diameter of the chest in infants [younger than 1 year] and children up to the onset of puberty	<ul style="list-style-type: none"> First aid providers should compress the chest at least one third the anteroposterior diameter of the chest in infants [younger than 1 year] to children up to the onset of puberty. 	No change
Chest Compression Rates	First aid providers should perform chest compressions at a rate of at least 100/min.	<ul style="list-style-type: none"> First aid providers should to perform chest compressions at a rate of 100-120/min. To simplify training, a goal of 30 compressions in 15 to 18 seconds should be encouraged. 	<ul style="list-style-type: none"> The actual number of chest compressions delivered per minute is determined by the rate of chest compressions and the number and duration of interruptions in compressions (e.g., to open the airway, deliver rescue breaths, allow AED analysis). See also Chest Compression Fraction description in the Principles section. In most studies, more compressions are associated with higher survival rates, and fewer compressions are associated with lower survival rates. Provision of adequate chest compressions requires an emphasis not only on an adequate compression rate but also on minimizing interruptions to this critical component of CPR.
HCP Assessment Sequence	Algorithm identifies this as separate steps.	<ul style="list-style-type: none"> In order to reduce the time to first compressions, when assessing an unresponsive person simultaneous assessment of breathing and pulse is recommended. 	<ul style="list-style-type: none"> Trained rescuers are encouraged to simultaneously perform some steps (i.e., checking for breathing and pulse at the same time), in an effort to reduce

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<p>HCP Child/Infant CPR (Witnessed vs. Unwitnessed)</p>	<p>No difference between treatment of witnessed vs. unwitnessed.</p>	<ul style="list-style-type: none"> • Witnessed: Follow Adult/Adolescent steps • Unwitnessed: Give 2 minutes of CPR, leave person to activate EMS and obtain AED, return and resume CPR, use AED as soon as it is available. 	<p>the time to first chest compression.</p> <ul style="list-style-type: none"> • If you have a witnessed arrest, the chances are extremely high the arrest is a VF arrest, the highest priority is to activate 9-1-1 (or emergency response system) and get the Defibrillator. The Defibrillator will provide you with the greatest chance of survival in VF arrest. • If the arrest is unwitnessed, the rescuer has no certainly it was sudden arrest or not. As most infants and children with cardiac arrest have an asphyxial rather than a VF arrest; 2 minutes of CPR are recommended before the rescuer activates 9-1-1 (or emergency response system) and gets an AED if one is nearby.
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Special Circumstances

Topic	Current	2016 Canadian Consensus	Rationale
Opioid-related life-threatening emergencies (aka: opioid overdose)	None	<ul style="list-style-type: none"> • There is an increased incidence of opioid-related deaths, and the prevalence of overdose education and naloxone distribution programs that equip laypeople to provide first aid in an opioid-related emergency. • A responder who has naloxone available may administer naloxone. • Basic life support (CPR/AED) should not be delayed to administer naloxone. • Responders should always activate emergency medical services and stay with the person until help arrives. • First aid and naloxone administration is not a substitute for definitive medical care. All people who receive naloxone should access professional care. • Availability of naloxone and naloxone training vary by region and jurisdiction. 	<ul style="list-style-type: none"> • Naloxone has an excellent safety profile and can rapidly reverse central nervous system (CNS) and respiratory depression in a person with an opioid-related life-threatening emergency. • It is reasonable to administer naloxone whenever an unresponsive person's condition is thought to be related to opioid intoxication. Naloxone is neither beneficial nor harmful in cardiac arrest, whether or not the cause is opioid-related. First aid providers should not perform pulse checks or attempt to distinguish cardiac arrest from severe respiratory depression in persons of opioid overdose. • In Canada, at the time of print (February 2016), naloxone is a Prescription Only Medication. At the time of print, naloxone kits and first aid training are available to the lay public under medical directives through public health agencies in Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. • Health Canada is advancing a proposal to remove Naloxone from the Prescription Drug List (PDL), allowing access to naloxone without a prescription or medical directive. Naloxone administration devices designed for lay rescuers are being evaluated by Health Canada.
Methods of Providing		<ul style="list-style-type: none"> • A single rescuer providing ventilations should use the mouth-to-mask ventilations. 	<ul style="list-style-type: none"> • Mouth-to-mask ventilation may be easier to learn and perform than the one-rescuer BVM technique.

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<p>Ventilations</p>		<ul style="list-style-type: none"> In situations where at least two rescuers are available to support ventilations, and are properly trained, the two-person BVM technique is preferred. 	<ul style="list-style-type: none"> When a single rescuer is required to perform both ventilations and compressions during one-rescuer CPR, the mouth-to-mask technique is simpler and faster, and results in shorter interruptions of chest compressions. One-rescuer BVM ventilation is a complex skill that is harder to learn and perform. In order to use this technique, the rescuer has to select the appropriate-sized mask and bag. Using one hand, the rescuer needs to open the person's airway and form an adequate seal between the mask and face. Then, using the other hand, the rescuer has to deliver the necessary tidal volume by squeezing the bag with one hand, while observing the person for visible chest rise. Mask designs and variations in technique influence the results.
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ⁱ Highlights of the 2015 Guidelines Update for CPR and ECC
ⁱⁱ 2015 Guidelines Update for CPR and ECC
ⁱⁱⁱ Circulation, part 5, S696, 2010 Guidelines for CPR and ECC
^{iv} IFRC, pp 22-23