2017 CPR & FIRST AID UPDATE GUIDE

WITH 2015 CPR AND FIRST AID RESUSCITATION GUIDELINES

LIFESAVING SOCIETY SASKATCHEWAN BRANCH
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The Lifesaving Society is Canada’s lifeguarding expert. The Society works to prevent drowning and water-related injury through its training programs, Water Smart® public education initiatives, water-incident research, aquatic safety management services, and lifesaving sport.

Annually, over one million Canadians participate in the Society’s swimming, lifesaving, lifeguard, and leadership training programs. The Society sets the standard for aquatic safety in Canada and certifies Canada’s National Lifeguards.

The Society represents Canada internationally as an active member of the royal Life Saving Society and the International Life Saving Federation. The Society is the Canadian governing body for lifesaving sport - a sport recognized by the International Olympic Committee and the Commonwealth Games Federation.

Did you know - Beginning in 1891 with the first Bronze Medallion, the Lifesaving Society recognized that first aid skills were a critical part of the lifesaving process. In the 1950s, the Society was the first Canadian organization to adopt mouth-to-mouth over manual methods of artificial respiration and since then has endeavored to maintain the most up-to-date and comprehensive first aid program in the country.

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2015 FIRST AID AND CPR GUIDELINES BACKGROUND OVERVIEW

The Lifesaving Society – Saskatchewan Branch is pleased to present the 2017 CPR and First Aid Update which covers the 2015 Canadian Consensus Guidelines on First Aid and CPR. All Lifesaving Society Instructors are required to review this document and follow the update process (see page 4 for process explanation).

International recommendations for resuscitation and first aid are currently updated on a five-year cycle to reflect recent advances in clinical research. The Lifesaving Society contributes research and reviews scientific evidence through the Royal Life Saving Society Commonwealth and International Life Saving Federation. In October 2015, the 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiac Care Science with Treatment Recommendations was published by the International Liaison Committee on Resuscitation (ILCOR). The ILCOR document in conjunction with the American Heart Association 2015 AHA Guidelines for CPR and ECC presents the latest treatment recommendations for CPR, ECC and First Aid. These recommendations and guidelines are based on a comprehensive, international evaluation of the best research available. In Canada and around the world, the ILCOR guidelines are used by organizations such as the Lifesaving Society to review and revise the standards and techniques for resuscitation and first aid skills within our programs.

As a member of the Canadian Guidelines Consensus Task Force, the Lifesaving Society worked with the Heart and Stroke Foundation, Canadian Red Cross, St. John Ambulance and Canadian Ski Patrol to review the new science and build consensus on the 2015 guideline changes. The building of consensus ensures that current and consistent training protocols and standards are used by all agencies across the country and are published in the 2015 Canadian Consensus Guidelines on First Aid and CPR.

The consensus document along with other research and position statements from the European Resuscitation Council (ERC) and the International Lifesaving Federation (ILS) were used to guide revisions to Lifesaving Society programs. This package explains the guideline changes and how they will be interpreted and used in Lifesaving Society training programs.
2017 FIRST AID AND CPR UPDATE FORM

All Lifesaving Society Instructors must complete the First Aid and CPR Update in order to continue teaching Society programs. In order to streamline and simplify the process of updating all Lifesaving Society Instructors across the province, the 2017 First Aid and CPR Revisions Update consists of an online video and quiz. This process must be completed by all Lifesaving Instructors, First Aid Instructors, National Lifeguard Instructors and all Instructor Trainers.

This update must be completed by **April 1st, 2017**. Instructors and/or Examiners may not instruct or examine Society programs until the update process has been completed. Test sheets will NOT be accepted if the award was instructed or examined by individuals that have not completed the update process.

**Three Step Update Process:**

1. Watch the video.
   *The video is 46 minutes long and was filmed at the BC & Yukon Lifesaving Society Branch. It reviews all of the changes to first aid and CPR as well as provides some video skits on treatment.*

2. Take the quiz.
   *The quiz consists of 25 multiple choice questions that come directly from the video. You must receive 80% or higher in order to pass the quiz (20/25). If you do not pass the quiz the first time, you can watch the video again and retake the quiz. At the end of the quiz your mark will be shown.*

3. Send in the 2017 First Aid and CPR Update Form
   *Please include payment ($20) when sending to the Branch Office. You will receive an email confirmation that your update has been received and processed.*

Once the processing form and payment is received the Branch will review the instructors grade and will input it into our computer system. At this point the instructor will be considered updated and can begin teaching the new information within their classes.

First & Last Name: ________________________________
Email: ________________________________
Grade received on Quiz: ____ / 25

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**FOR OFFICE USE ONLY**

Date Received ____________
Payment Received ☐Grade Verified ☐Verified in MM ☐

Invoice Number ____________
**Updated Materials**

All Lifesaving Society Instructors are encouraged to purchase updated manuals which contain the 2015 First Aid and CPR Guidelines. Updated Manuals and Award Guides will be made available through the Lifesaving Society office to ensure that instructors and candidates will have access to training that applies the latest research and is designed to improve survival and enhance the effectiveness of the Canadian Chain of Survival. Manuals with the *2010 CPR guidelines* are still considered “good” and can continue to be used until they are circulated out of stock. The most current versions of the literature will be:

- **Canadian First Aid Manual**
  You can identify the updated printing at a glance: the front cover reads “With the 2015 CPR guidelines” in upper left corner. The publication date on the inside cover will be Fourteenth Printing, revised October 2016.

- **Canadian CPR-HCP Manual**
  You can identify the updated printing at a glance: the front cover reads “With the 2015 CPR guidelines” in upper left corner. The publication date on the inside cover will be Fourth Printing, revised October 2016.

- **Alert: Lifeguarding in Action**
  You can identify the updated printing at a glance: the publication date on the inside cover will be Nineteenth Printing, October 2016.

- **Bronze Medals Award Guide**
  You can identify the updated printing at a glance: the front cover reads “With the 2015 CPR guidelines.” The publication date on the inside cover will be Sixteenth Printing, revised, October 2016.

- **National Lifeguard Award Guide**
  You can identify the updated printing at a glance: the front cover reads “With the 2015 CPR guidelines.” The publication date on the inside cover will be Fourth Printing, revised, October 2016.

- **First Aid Award Guide**
  You can identify the updated printing at a glance: the front cover reads “With the 2015 CPR guidelines.” The publication date on the inside cover will be Tenth Printing, revised, October 2016.

- **Canadian CPR Manual**
  You can identify the updated printing at a glance: the front cover reads “With the 2015 CPR guidelines.” The publication date on the sixth page will be Fourth Printing, revised, October 2016.
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SUMMARY OF CHANGES IN RESUSCITATION

This section summarizes the changes in basic life support and first aid as published in:

- The ILCOR guidelines document in conjunction with the 2015 AHA Guidelines for CPR and ECC (the guidelines are published in Circulation and are available at http://circ.ahajournals.org as well as through the link in the Instructor Log-In).
- The 2015 Canadian Consensus Guidelines on First Aid and CPR.

For more detailed information, the reader is encouraged to review the referenced documents as identified in each section below.

THE CHAIN OF SURVIVAL

KEY MESSAGE

Instructors can use both Chains of Survival to emphasize the importance of further medical care both in and out of hospital care.

CHANGES IN LITERATURE

None

RATIONALE

In order to improve victim outcomes, two separate ‘Chains of Survival’ have been recommended to reflect the differences when responding to a cardiac arrest when in and out of the hospital (Circulation Part 4, page S397-S398).

A person experiencing an ‘Out-of-Hospital Cardiac Arrest’ (OHCA) is dependent on their community and first responders for support. A person experiencing an ‘In-Hospital Cardiac Arrest’ (IHCA) depends on the smooth interaction of various departments to respond when a cardiac arrest occurs (Canadian Consensus Guidelines page 1).

The OHCA chain, found below, will be taught in all Lifesaving Society programs. Instructors qualified to teach Health Care Provider (HCP) courses may reference the IHCA chain, found in the HCP section of this document, if teaching or recertifying hospital employees (such as nurses or doctors).
HANDS-ONLY CPR

KEY MESSAGE

Hands only CPR can be taught as a knowledge component to educate lay rescuers. Evaluation of CPR in Lifesaving Society programs must include both compressions and rescue breaths.

CHANGES IN LITERATURE

None

RATIONALE

It is important to note that there has been no change regarding hands-only (compression-only) CPR in Society programs.

If a bystander is not trained in CPR, EMS dispatchers will direct them to provide hands-only CPR for the adult victim who suddenly collapses. Discomfort with the application of rescue breaths was the primary reason cited for lay rescuers not providing resuscitation. Trained rescuers will continue to provide rescue breaths along with compressions when performing CPR (30:2).

Hands-only CPR can be taught as a knowledge item as it would be appropriate for trained rescuers who do not have access to a pocket mask and are uncomfortable with direct mouth-to-mouth contact. Candidates must perform rescue breaths as per the standard in order to be certified in the level being taught.

EMS & USE OF MOBILE PHONES

KEY MESSAGE

Use of mobile technologies for quick activation to call EMS and use of speakers mode to communicate with EMS dispatchers is emphasized.

CHANGES IN LITERATURE

Canadian First Aid Manual
- EMS (pg. 8)
- Action: ABC Priorities (pg. 22)

Canadian Lifesaving Manual
- One rescuer CPR procedure (pg. 7-13)
- Two rescuer CPR procedure (pg. 7-17)

RATIONALE

In the Canadian First Aid Manual, this principle will be incorporated in revised wording in EMS (p. 8) and in Action: ABC Priorities (p. 22).

In addition to the traditional methods of contacting Emergency Medical Services (EMS), it is recommended that the use of mobile phones be taught in order to better reflect current technology and to decrease delays in EMS response times.
If a mobile phone/service is available, it is recommended that the rescuer or bystander call EMS and then put the phone on speaker mode. This allows the rescuer to talk to dispatch while assessing and treating the victim and may enhance rescuer effectiveness through supportive communication with EMS (Circulation Part 5, page S414-S416/Canadian Consensus Guidelines page 1-2).

If a mobile phone and/or service is not available, the traditional method of sending a bystander to find a phone and to call EMS is still appropriate.

The lone rescuer (no bystanders or access to a mobile phone/service) will immediately activate EMS, retrieve an AED (if available) and then start CPR on an adult. The lone rescuer will perform 5 cycles (2 minutes) of CPR on a child or infant prior to calling 911 and retrieving the AED (if available).

**THE BREATHING CHECK**

**KEY MESSAGE**

Instructors should ensure that they are including education on ineffective or abnormal breathing during the primary assessment instruction.

**CHANGES IN LITERATURE**

None

**RATIONALE**

As per the 2010 ILCOR/AHA guidelines, if a victim is not breathing or not breathing effectively, the rescuer will immediately start CPR with compressions (or with 2 rescue breaths for drowning victims).

The 2015 ILCOR/AHA guidelines show that lay rescuers still mistake seizure-like activity and/or ineffective or abnormal breathing (to include agonal breathing) as signs of life resulting in the delay of CPR (Circulation Part 5, page S415).

Use of approved videos can be used to train rescuers in recognizing ineffective breathing and seizure-like activity resulting in a quicker response and better victim outcomes.

**EFFECTIVE CPR**

**KEY MESSAGE**

For adult victims, rescuers should compress the chest at least 5 cm but no more than 6 cm. “Push hard, Push fast” remains valid for effective CPR. In the 2015 Guidelines “Fast” means 100 to 120 compressions per minute. The Guidelines suggest rescuers aim for 30 compressions in 15 to 18 sec.

**CHANGES IN LITERATURE**

Canadian First Aid Manual

- Depth: How far to push down the breastbone (pg. 27)
- Three tips for good, effective CPR (pg. 28)
• Counting (pg. 28)

Canadian Lifesaving Manual

• One rescuer CPR procedure (pg. 7-13)
• Compression Rate (pg. 7-14)
• Three tips for good effective CPR (pg. 7-15)
• Two rescuer CPR procedure (pg. 7-17)

Bronze Medals Award Guide

• Bronze Star – Item 10 Notes (pg. 11)
• Bronze Medallion – Item 7 Notes (pg. 26)
• Bronze Cross – Item 5 Notes (pg. 44)
• Bronze Cross – Item 7c Notes (pg. 48)

National Lifeguard Award Guide

• Cardiopulmonary Resuscitation Notes (pg. 80/81)

RATIONALE

Data collected from 2010 to 2015 reinforces that high quality CPR (to include adequate rate, depth and recoil) improves survival rates (Circulation Part 5, page S419-S420/Canadian Consensus Guidelines page 2 and 9).

A small study found that compression depths exceeding 6 centimeters (2.4 inches) in an adult may be associated with increased rates of non-life threatening injury when compared with compression depths of 5 to 6 centimeters (2.0-2.4 inches).

Recent studies suggest that a rate of 100-120 compressions/minute were linked to the highest survival rates. Often, the faster a rescuer compresses the chest, the shallower the compression depth (or they do not allow the chest to fully rise) resulting in a decrease in circulation.

It is important not to confuse compression rate (the speed at which compressions are performed) with compression fraction (the amount of time on the chest during a rescue). In most studies, more time on the chest is associated with higher survival rates. As such, rescuers should minimize the frequency and duration of interruptions (no more than 10 seconds) and maximize time on the chest (a target of 60%). See Appendix A: CPR Process Chart for Lay Rescuers.

<table>
<thead>
<tr>
<th></th>
<th>Compression Depth</th>
<th>Landmarking</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult (8 years +)</td>
<td>At least 5cm but not greater than 6cm (2.0 to 2.4 inches)</td>
<td>The centre of the chest on the sternum (Figure 2)</td>
<td>A compression rate of no less than 100/minute and no more than 120/minute for all age groups (30 compressions in 15-18 seconds). Allow the chest to fully recoil or release after each compression (Figure 3).</td>
</tr>
<tr>
<td>Child (1-8 years)</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (about 5cm or 2 inches)</td>
<td>The centre of the chest on the sternum (Figure 2)</td>
<td></td>
</tr>
</tbody>
</table>
**OBSTRUCTED AIRWAY PROCEDURES**

**Key Message**

As indicated in the 2010 ILCOR/AHA guidelines, abdominal thrusts, back blows, and chest thrusts are all effective in clearing a severe obstruction in a conscious victim. Candidates may use whatever technique is the most effective and are encouraged to change techniques if one is not effective.

**Changes in Literature**

None

**Rationale**

Although there is no change to this guideline from 2010, the Canadian Guidelines Consensus Task Force has agreed that a principle-based approach to clearing a severe airway obstruction would be the recognized standard (Canadian Consensus Guidelines page 4). The Lifesaving Society standard for dealing with a severe conscious airway obstruction (adult/child) is to clear the airway. As such, a candidate can start with abdominal thrusts, back blows or chest thrusts provided the technique is appropriate (e.g. abdominal thrusts are not appropriate for pregnant victims) and if the selected technique does not work, the rescuer selects another (e.g. after 5 attempts).

It is the responsibility of each Branch to determine if they want to select a specific starting point (e.g. start with back blows versus abdominal thrusts) for ease of teaching, however, a candidate cannot be failed if they start with a different technique provided that it is appropriate and clears the airway.
SUMMARY OF CHANGES IN FIRST AID

The ILCOR First Aid Task Force was formed in 2013 to review and evaluate scientific literature on first aid in preparation for the development of international first aid guidelines.

VICTIM POSITIONING

KEY MESSAGE
Victims should be left in the position found unless breathing can not be assessed. If no spinal injury is suspected and the victim is unconscious and being left unattended you may put them into a recovery position.

CHANGES IN LITERATURE
None

RATIONALE
All victims should be left in the position found unless breathing cannot be assessed. If breathing cannot be assessed, then the victim should be rolled into the supine position (on the back). Whenever a victim is being left unattended or is breathing on their own, they should be placed in the lateral, side-lying recovery position (where a spinal injury is not suspected). This position is designed to maintain a patent airway and reduce the risk of airway obstruction and aspiration.

In the lateral, side-lying recovery position, the victim should be stable with the torso approaching true lateral (no pressure on the chest to impair breathing). The head can be dependent or lying on the arm (Circulation Part 15, page S575/Canadian Consensus Guidelines page 7).

SPINAL MOTION RESTRICTION

KEY MESSAGE
The 2015 Guidelines acknowledge a lack of evidence to support the benefits of spinal immobilization and the use of immobilization devices by first aiders. In a water rescue, a spineboard is mainly an extraction device for a breathing victim with a suspected spinal injury. However, when the need for CPR is indicated, use of a spineboard should never delay victim removal and the immediate commencement of CPR.
**Changes in Literature**

Canadian First Aid Manual
- Circulation (pg. 58)
- Use of spine boards (pg. 59)

Canadian Lifesaving Manual
- Sidebar (pg. 5-19)
- EMS transport and spineboards (pg. 5-22)

Alert: Lifeguarding in Action
- Management of Spinal Injuries (pg. 53)

National Lifeguard Award Guide
- Pool - Management of spinal injured victim Notes, Item 9c (pg. 20)
- Waterpark – Management of spinal injured victim Notes, Item 11c (pg. 40)
- Waterfront – Management of spinal injured victim Notes, Item 10c (pg. 59)
- Surf Item - Management of spinal injured victim Notes, 9c (pg. 77)

**Rationale**

The terms spinal immobilization and spinal motion restriction have been used synonymously over the past several years. The term spinal motion restriction is now being used to describe the practice of attempting to maintain the spine in anatomical alignment and minimizing gross movement since true spinal immobilization is not possible to achieve (Circulation Part 15, page S579/Canadian Consensus Guidelines page 7).

A large amount of force is required to fracture the spine, as such; spinal motion restriction should only be used for victims whose injuries were incurred via high impact/high risk activity (to include a fall of greater than 3 feet/1 metre or 5 stairs) and who have signs of unreliability (a decreased level of consciousness or intoxication) or injury (paralysis).

The 2015 scientific review will not result in any changes to the current treatment protocols for lay rescuers (Emergency First Aid and Standard First Aid).

If a spinal injury is suspect and effective breathing is present, the rescuer will manually support the person’s head in the position found.

If a spinal injury is suspect and effective breathing is not present, carefully roll the person onto their back (unstable spinal injuries are extremely rare) and start resuscitation protocols.

The routine application of cervical collars is not recommended and traditional immobilization devices should only be used for extrication if the rescuer has been trained in its use (e.g. lifeguards).
**CONCUSSION**

**KEY MESSAGE**

Concussions are difficult for first aiders to recognize, however the 2015 Guidelines further discuss the mechanism of injury, how to recognize a concussion, and the importance of removing the victim for the activity to further see medical attention.

**CHANGES IN LITERATURE**

Canadian First Aid Manual
- “Concussion” sidebar (pg. 52)
- Concussion Signs and Symptoms (pg. 52)
- Concussion Treatment (pg. 52)

Canadian Lifesaving Manual
- “Concussion” sidebar (pg. 8-11)

**RATIONALE**

The signs and symptoms of concussion (mild traumatic brain injury) can include loss of consciousness (or changes in LOC), confusion, loss of memory, dizziness, headache, vision problems, unsteadiness and nausea. Due to the complexity of the signs and symptoms (victim may suffer all, some or none of these signs), rescuers can find the recognition of concussion difficult.

A rescuer should call EMS for any person who has experienced a loss of consciousness due to a blow to the head. All other persons who have sustained a head injury should be encouraged to discontinue activity (sport or other recreational activity) and seek medical aid (Circulation Part 15, page S579/Canadian Consensus Guidelines page 3).

**ANAPHYLAXIS**

**KEY MESSAGE**

The 2015 Guidelines recommend a second dose of epinephrine be administered after 5 minutes if the signs and symptoms do not improve after the initial dose. Twinject auto-injectors are under recall and are no longer being manufactured.

**CHANGES IN LITERATURE**

Canadian First Aid Manual
- Severe Allergies/Anaphylaxis Treatment (pg. 45)

Canadian Lifesaving Manual
- Anaphylaxis Treatment (pg. 8-3)

Alert: Lifeguarding in Action
- Epinephrine Auto-injectors (pg. 3 of insert)
Rationale
A severe anaphylactic reaction involves two or more body systems and can be life-threatening if not recognized and treated promptly. As per the 2010 guidelines, it is important that rescuers continue to be taught the signs and symptoms of anaphylaxis, the importance of calling EMS and how to assist with (or administer) epinephrine to a victim suffering a severe allergic reaction.
If a person suffering from a severe anaphylactic reaction does not respond to the initial dose of epinephrine, a second dose may be given if symptoms are not relieved or are worsening after 5 minutes (Circulation Part 15, page S577/Canadian Consensus Guidelines page 2-3).

Non-Traumatic Chest Pain (Heart Attack/Angina)

Key Message
Victims suffering chest pain are encouraged to chew aspirin/ASA.

Changes in Literature
Bronze Medals Award Guide
- Notes-Bronze Medallion, Item 9b (pg. 31)
National Lifeguard Award Guide
- Heart Attack of Angina Notes (pg. 83)

Rationale
Although ASA will not make the pain go away, it can help to stop clotting in the arteries, thus reducing damage to the heart. If the victim has their own ASA (acetylsalicylic acid/Aspirin), assist them in taking it provided:
- They are not Allergic to ASA or ibuprofen
- They do not have a history of recent or Active bleeding
- They do not have a history of Asthma
- Their doctor has not Advised Against taking ASA
- They do not have a history of a recent traumatic head injury
Have the victim chew (1) adult ASA tablet or (2) 'low dose' ASA tablets. DO NOT substitute acetaminophen (Tylenol) or ibuprofen (Advil/Motrin) as they block the blood-thinning effect of ASA (Circulation Part 15, page S577/Canadian Consensus Guidelines page 3).
If an angina victim is prescribed nitroglycerine, they can take up to 3 doses at intervals of 3-5 minutes provided that their level of consciousness remains good. Victims should not take nitroglycerine if they have taken sexual performance enhancing drugs (ie. Cialis, Viagra, Levitra) within 24 hours.
**STROKE ASSESSMENT**

**KEY MESSAGE**

The 2015 Guidelines suggest first aiders can use the acronym “F.A.S.T.” (Face. Arms. Speech. Time) to help assess a suspected stroke victim.

**CHANGES IN LITERATURE**

Canadian First Aid Manual
- “Stroke” sidebar (pg. 35)

Canadian Lifesaving Manual
- “Stroke” sidebar (pg. 8-8)

National Lifeguard Award Guide
- Stroke/TIA Notes (pg. 83)

**RATIONALE**

A stroke is a medical emergency requiring immediate medical attention. The goal is for a victim to receive definitive treatment as soon as possible, ideally in less than 3 hours from the onset of symptoms.

Early stroke recognition through the use of stroke-assessment systems decreases the interval between the time of stroke onset and arrival at the hospital and definitive treatment. This is associated with better outcomes, such as improved neurologic function.

The Face, Arm, Speech, Time (FAST) stroke assessment system is a simple tool that can be used with high sensitivity for the identification of stroke (Circulation Part 15, page S576 to S577/Canadian Consensus Guidelines page 8).

- F (face drooping)
- A (arm weakness)
- S (speech difficulty)
- T (time of onset of symptoms)

It is difficult to differentiate between a transient ischemic attack (TIA) and a stroke. If any of the above signs and symptoms are present (regardless of duration), treat as a stroke.

**HYPOGLYCEMIA**

**KEY MESSAGE**

The 2015 Guidelines suggest the preferred first aid treatment option is to provide glucose tablets to an individual suffering hypoglycemia. Hard candy like Mentos, Skittles, or Jelly beans are a second choice. Last choice would be orange or other fructose juice drinks.

**CHANGES IN LITERATURE**

Canadian First Aid Manual
- Diabetes Treatment (pg. 46)
RATIONALE
Evidence from the 2015 ILCOR systematic review identified that glucose tablets are more effective in the treatment of hypoglycemia compared to dietary sugars such as candy, chocolate bars, orange juice or milk (Circulation Part 15, page S577 to S578/Canadian Consensus Guidelines page 5-6).
If a person with diabetes reports low blood sugar or exhibits signs or symptoms of mild hypoglycemia, oral glucose should be given if the person can follow simple commands and swallow. If glucose tablets are not available, the following dietary sugars are recommended (in order of effectiveness):
- Mentos (5-10 mints)
- Skittles (20-25 candies)
- Jelly beans (15-20 beans)
- Unsweetened orange juice from concentrate (200ml)
Symptoms of hypoglycemia can take 10 to 15 minutes to resolve after ingesting glucose tablets or dietary sugars, as such, rescuers should wait at least 10 minutes before calling EMS and/or providing additional oral sugars.

TREATMENT OF SEVERE BLEEDING

KEY MESSAGE
The 2015 Guidelines suggest the use of a tourniquet when direct pressure fails to control life-threatening external limb bleeding.
Use of tourniquets is not required in any of the programs, but candidates should understand the purpose of a tourniquet.

CHANGES IN LITERATURE
Canadian First Aid Manual
- Treatment for Major Bleeding (pg. 36)
Bronze Medals Award Guide
- Bronze Medallion – Item 9c Notes (pg. 31)
National Lifeguard Award Guide
- External Bleeding Notes (pg. 83)

RATIONALE
Severe bleeding is best controlled by applying and maintaining firm, direct pressure to the wound. There continues to be no evidence to support the use of pressure points or elevation of an injury to control external bleeding.
The use of a tourniquet should be considered when direct pressure fails to control life-threatening external limb bleeding (or for circumstances such as wound inaccessibility, multiple injuries, multiple people/disaster settings or remote locations) since the rate of complications is low and the chance of significant blood loss is high (Circulation Part 15, page S578 to S579/Canadian Consensus Guidelines page 3).

A tourniquet should be approximately 5cm (2 inches) wide, placed as close to the wound as possible (at least 5cm/2 inches above the injury while avoiding joints) and applied directly onto exposed skin to avoid slipping. Effectiveness of the tourniquet use will be determined by cessation of external bleeding, not by the presence or absence of a distal pulse (Emergency Medicine Journal; Tourniquet use in the civilian prehospital setting. 2007 Aug; 24(8): 584–587).

It is important to note that a wider tourniquet does not necessarily reduce damage to the limb. Tourniquets that are more 5cm (2 inches) in width increase the amount of tissue that must be compressed, requiring an increased effort to produce tension. As the width of the strap increases, the strap tends to bow, resulting in more pressure to the centre rather than the edges and therefore reducing functional width.

**OPEN CHEST WOUNDS**

**Key Message**

The 2015 Guidelines recommend that leaving an open chest wound exposed is preferable to taping the wound with plastic because of the life-threatening adverse effects this may have. A non-adhering and permeable dressing that allows liquids or gasses to pass through is preferred.

**Changes in Literature**

Canadian First Aid Manual
- Open chest wound Treatment (pg. 63)

Canadian Lifesaving Manual
- Chest wounds Treatment (pg. 8-13)

**Rationale**

Management of an open chest wound is challenging and requires immediate activation of EMS. Use of an improperly applied occlusive (air-tight) dressing to treat an open pneumothorax can result in a fatal tension pneumothorax, as such, the use of a three-sided occlusive dressing is no longer recommended (Circulation Part 15, page S579/Canadian Consensus Guidelines page 6).

A rescuer can leave an open chest wound exposed to ambient air without a dressing if bleeding is minor. A non-occlusive dressing (dry gauze) can applied for active or severe bleeding, however, the dressing must be changed if it becomes...
saturated (can lead to partial or complete occlusion that can result in a tension pneumothorax).

MINOR WOUND CARE

KEY MESSAGE
The use of antibiotic ointment on superficial wounds may be used to promote healing as long as the individual has no sensitivity to antibiotics such as penicillin.

CHANGES IN LITERATURE
Canadian First Aid Manual
- Wounds (pg. 49)

Canadian Lifesaving Manual
- External Bleeding Treatment (pg. 8-9)
- “Applying a tourniquet” sidebar (pg. 8-9)

RATIONALE
Studies have shown that clean running tap water to irrigate a wound was more effective than normal saline in improving wound healing and lowering infection. The use of soap and water to clean an open wound is no longer recommended as soap has been found to be toxic to the cells. Where provincial legislation allows, a triple antibiotic ointment can be applied to minor wounds to help reduce the risk of infection and promote faster healing (Canadian Consensus Guidelines page 7-8).

DENTAL INJURIES

KEY MESSAGE
Do not try to reinsert any teeth that may have dislodged from a victim’s mouth.

CHANGES IN LITERATURE
None

RATIONALE
Rescuers should not attempt to reinsert an avulsed tooth due to the increased likelihood of additional soft-tissue injury to the gums, risk of infection and the possibility of an obstructed airway (Circulation Part 15, page S580/Canadian Consensus Guidelines page 4).
The avulsed tooth should not be cleaned (damage to the tissues) and should be held at the crown, not the root. The avulsed tooth may be placed in a balanced salt solution, egg whites, coconut water, or whole milk (in order of preference). If none of these solutions are available, it may be reasonable to store an avulsed tooth in the injured person’s saliva (not in the mouth).
**FRactures**

**Key Message**

Rescuers should limit the movement of any bone or joint injuries. Unless a victim needs to be moved a significant distance, avoid using a splint on the injury.

**Changes in Literature**

None

**Rationale**

As a general rule, rescuers should not move or try to straighten an injured extremity. In the event that the person will be transported by EMS, rescuers should not splint the fracture in order to prevent unnecessary pain or soft tissue damage. Ice can be applied (with a barrier between the skin and the ice) for up to 20 minutes if there is good circulation distal to the injury site (Circulation Part 15, page S580/Canadian Consensus Guidelines page 4-5).

In the event that the rescuer needs to move the victim (wilderness settings, unsafe environment), they should splint in a way that limits pain, reduces the chance for further injury, and facilitates safe and prompt transport.

If an injured extremity is blue or extremely pale, activate EMS immediately (only realign if next level of care is more than 2 hours away and directed by EMS dispatch).

**Frostbite**

**Key Message**

The 2015 Guidelines for treatment of frostbite support rewarming body parts with warm water immersion for 20-30 min and avoid chemical warmers.

**Changes in Literature**

Canadian First Aid Manual
- Frostbite Treatment (pg. 76)

Canadian Lifesaving Manual
- Frostbite Treatment (pg. 8-23)

**Rationale**

Evidence has shown that rapid re-warming of frostbitten areas with water baths between 37° C and 42° Celsius (98.6-104 degrees Fahrenheit) for 20-30 minutes improved outcomes and reduced tissue loss for victims who are not suffering low levels of consciousness. Chemical warmers should not be used as they can reach temperatures that often exceed 40 degrees Celsius (can cause burns). Rescuers should only attempt re-warming frostbitten areas if there is no risk of the area refreezing. For severe frostbite, re-warming should be accomplished within 24 hours of the injury. After re-warming, protect frostbitten parts from re-freezing.
(dressed with sterile gauze and gauze placed between digits) and quickly transport to medical care (Canadian Consensus Guidelines page 5).

**HYPOTHERMIA**

**KEY MESSAGE**

Treatment for hypothermic victims has been streamlined.

**CHANGES IN LITERATURE**

None

**RATIONALE**

As per the 2015 IFRC guidelines, passive rewarming should be performed on victims suffering from mild to moderate hypothermia and active rewarming should be performed for victims suffering from moderate to severe hypothermia. Rescuers can identify the three stages of hypothermia based on the following signs and symptoms (*State of Alaska Cold Injuries Guidelines for Wilderness Emergency Care*) and the treatment options for mild-moderate and moderate-severe hypothermia (*Dr. Gordon Giesbrecht, University of Manitoba Faculty of Kinesiology and Recreation Management*):

**STAGES OF HYPOTHERMIA CHART**

<table>
<thead>
<tr>
<th>Classifications of Hypothermia</th>
<th>Core Body Temperature</th>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Above 95°F 35°C</td>
<td>Cold sensation shivering</td>
</tr>
<tr>
<td>Mild</td>
<td>95-90°F 35-32°C</td>
<td>Shivering Minor physical or mental impairment</td>
</tr>
<tr>
<td>Moderate</td>
<td>90-82°F 32-28°C</td>
<td>Below 90°F (32°C) shivering stops Below 86°F (30°C) consciousness is lost</td>
</tr>
<tr>
<td>Severe</td>
<td>Below 82°F 28°C</td>
<td>Rigidity Vital signs reduced or absent Severe risk of cardiac arrest from rough handling</td>
</tr>
<tr>
<td></td>
<td>Below 77°F 25°C</td>
<td>Spontaneous cardiac arrest</td>
</tr>
</tbody>
</table>
## Treatment of Mild to Moderate and Moderate to Severe Hypothermia

<table>
<thead>
<tr>
<th>Mild to Moderate Hypothermia</th>
<th>Moderate to Severe Hypothermia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove wet clothing and insulate body from the cold. Rewarm if more than 30 minutes to a hospital (37°C - 42°C or 98.6°F - 104°F). Shivering should be fueled by calorie replacement with fluids containing sugars (ensure victim can swallow). External heat can be applied to high heat transfer areas such as the underarms and sides of the chest.</td>
<td>Call EMS immediately. Handle with great care (minimal gross motor movement). Place in a horizontal position. Gently remove wet clothing. Insulate body from the cold. If the victim is not breathing/not breathing effectively, begin CPR as per the current resuscitation standards.</td>
</tr>
<tr>
<td>A warm shower or bath may be tolerated by an individual that is alert and mobile.</td>
<td>External heat can be applied if responsive (37°C - 42°C or 98.6°F - 104°F).</td>
</tr>
<tr>
<td>Alcohol and tobacco use should not be permitted as they constrict blood flow.</td>
<td>Arms, hands, feet and legs should not be rubbed or manipulated. Do not place in a warm shower or bath. Do not give fluids or food.</td>
</tr>
</tbody>
</table>

## Sun Exposure

**Key Message**
Lifeguards should practice self safety by following the Canadian Cancer Society’s recommendations of wearing SPF 30+.

**Changes in Literature**
Alert: Lifeguarding in Action
- The Sun (pg. 24)

**Rationale**
In 2016, the Canadian Cancer Society updated its sun protection recommendations which should be of special interest to all lifeguards working in outdoor settings.

## Poisoning/Drug Use

**Key Message**
Rescuers may choose to take additional training to supplement their current training.
**Changes in Literature**

None

**Rationale**

In recent years, there has been a significant rise in the number of unintentional deaths due to opioid overdoses (e.g. oxycontin, vicodin, morphine, codine, heroin). In an effort to combat opioid-related deaths, community-based harm reduction programs have been established in many Canadian cities. These programs educate lay rescuers on how to administer naloxone (Narcan) to a person suffering from an opioid-related emergency (Circulation Part 10, page S504 to S506/Canadian Consensus Guidelines page 11).

At the time of print (February 2016), naloxone was still considered a prescription-only medication, as such, only rescuers trained in its use should administer the medication to a person suffering from an opioid overdose. If a rescuer is not trained in the use of naloxone, they will still call EMS and provide resuscitation as needed.
SUMMARY OF CHANGES IN DROWNING & WATER RESCUE

DROWNING CHAIN OF SURVIVAL

KEY MESSAGE

The Drowning Chain of Survival is a simple and clear tool to refine the call for prevention and action in Canada.

![Drowning Chain of Survival Diagram]

CHANGES IN LITERATURE

None

RATIONALE

The Lifesaving Society has created a Drowning Chain of Survival and accompanying position statement to align with the International Lifesaving Federation. International and national cooperating organizations, including the Lifesaving Society, are contributing to the reduction of drowning worldwide by providing consistent messaging to communities world wide. Drowning is a major global public health problem and effective prevention of drowning requires programs and policies that address known risk factors throughout Canada. Drowning prevention through Water Smart® education and lifesaver/lifeguard training has always been a focus of the Lifesaving Society. Canadian Lifesaving programs and National Lifeguard prepares candidates for service beyond the instructional setting to be able to make Water Smart® choices,
educate/inform others on Water Smart® choices, recognize distress, safely complete rescues, and provide care following removal from water. It is important for candidates in Lifesaving Society programs to understand the Drowning Chain of Survival and the role they play in implementing the Drowning Chain of Survival.

THE TEAM APPROACH

KEY MESSAGE
Having multiple rescuers working on multiple components of the rescue will help to streamline the rescue process.

CHANGES IN LITERATURE
None

RATIONALE
The concept of a team approach to resuscitation as discussed in the Health Care Provider section can be easily applied to a team of trained lifeguards. A team of trained lifeguards may use a choreographed approach to resuscitation where multiple assessments and/or treatments are performed simultaneously rather than in the sequential manner used by individual rescuers (e.g., one rescuer activates the emergency response system, a second begins CPR, and a third retrieves and sets up a defibrillator). Lifeguard training should focus on building the team as each member arrives or delegating roles if multiple rescuers are present. This better reflects real life applications in most supervised aquatic settings.

USE OF OXYGEN

KEY MESSAGE
The 2015 Guidelines caution oxygen supplementation may be contraindicated for some victims who do not warrant its use. Recommendations include the use of oxygen for drowning victims, decompression sickness, carbon monoxide poisoning, respiratory arrest, and for victims with a pulse oximetry reading of less than 94%.

CHANGES IN LITERATURE
Canadian First Aid Manual
- Oxygen Administration (pg. 84)
- Pulse Oximetry (pg. 88)
Alert: Lifeguarding in Action
- Oxygen (pg. 83)

RATIONALE
Although oxygen has proven beneficial in the treatment of some hypoxic conditions, several studies indicate that it can be harmful in the treatment of a victim suffering

It is recommended that oxygen be provided to any victim suffering from drowning, decompression sickness, and carbon monoxide exposure. Supplemental oxygen should only be given to victims suffering from other emergencies (e.g. chest pain, shock, bleeding) if they have a blood oxygen saturation of less than 94% as measured by a pulse oximetry device.

A pulse oximeter is easy to use and can be easily incorporated into oxygen therapy programs (follow the manufacturer's directions on use. It is important to note that a pulse oximeter can be used on a wet victim, but is not always reliable on a cold victim (hypothermia).

**Spinal Motion Restriction**

**Key Message**

**Changes in Literature**

**Rationale**

Although the 2015 scientific review did not result in any changes to the treatment protocols for lay rescuers (Emergency First Aid and Standard First Aid), there is a change on how trained rescuers will treat a suspected spinal-injured victim in the water.

If a suspected spinal-injured victim requires CPR, the rescuers will take a 'life over limb' approach and immediately remove the victim from the water (protecting the head from any unnecessary movement) and start resuscitation efforts.

If a suspected spinal-injured victim is breathing, there will be no changes to the current protocols since traditional immobilization devices can still be used for extrication (removal of the victim from the water).

**High Voltage Wires**

**Key Message**

First aiders should never attempt to move or remove high-voltage wires and power lines.

**Changes in Literature**

Canadian First Aid Manual
Electrical Burns Treatment (pg. 69)
Canadian Lifesaving Manual
- Illustration removed (pg. 6-2)
Rationale
Any high voltage lines present a hazard to the rescuer and

Summary of Changes for Health Care Providers

Unless otherwise stated, all resuscitation recommendations as outlined in the previous section will also be applied to the Health Care Provider (HCP) level.

The Chain of Survival

Key Message
The 2015 Guidelines outline 2 distinct “chains of survival” which reflect the setting as well as the availability of rescuers and resources. The updated Canadian CPR-HCP Manual will describe chains of survival for: the In-hospital cardiac arrest (IHCA); and the Out-of-hospital cardiac arrest (OHCA).

Changes in Literature
Canadian CPR-HCP Manual
Chain of Survival (pg. 1)

Rationale
As mentioned previously, in order to improve victim outcomes, two separate ‘Chains of Survival’ have been recommended to reflect the differences when responding to a cardiac arrest when in and out of the hospital (Circulation Part 4, page S397-S398).
The ‘Out-of-Hospital Cardiac Arrest’ (OHCA) chain will be taught in all Lifesaving Society programs. Instructors qualified to teach Health Care Provider (HCP) courses may reference the IHCA chain if teaching or recertifying hospital employees (such as nurses or doctors).
THE TEAM APPROACH

KEY MESSAGE

The 2015 Guidelines recommend dedicated in-hospital resuscitation teams that specialize in cardiac arrest response. These teams will perform best when they know who is leading the resuscitation effort, who is performing what role, and how to communicate and work together most effectively.

CHANGES IN LITERATURE

Canadian CPR-HCP Manual
- High Performance Teams (pg. 3)

RATIONALE

The concept of a team approach to resuscitation was first introduced in 2010 and is reinforced in the 2015 guidelines (Circulation Part 5, page S415/Canadian Consensus Guidelines page 2).

A team of trained rescuers may use a choreographed approach to resuscitation where multiple assessments and/or treatments are performed simultaneously rather than in 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).

HCP training should focus on building the team as each member arrives or delegating roles if multiple rescuers are present. This better reflects real life applications in ambulance or hospital settings.
ASSESSMENT

KEY MESSAGE

CHANGES IN LITERATURE

RATIONALE

The assessment steps for health care providers are essentially unchanged from the previous guidelines (a health care provider could assess breathing and pulse separately or simultaneously). In 2010, the Lifesaving Society supported the individual assessment approach for ease of teaching and to provide consistency in training across the country. As per the 2015 guidelines, a simultaneous assessment of breathing and pulse should be performed (for less than 10 seconds) in an effort to reduce the time to the first chest compression (Circulation Part 5, page S415 and S418/Canadian Consensus Guidelines page 9).

NON-TRAUMATIC CHEST PAIN (HEART ATTACK/ANGINA)

KEY MESSAGE

Victims suffering chest pain are encouraged to chew aspirin/ASA.

Treatment and descriptions are being changed to be consistent with the Canadian First Aid Manual.

CHANGES IN LITERATURE

Canadian CPR-HCP Manual

- Angina and Heart Attack Description and Treatment (pg. 4)

RATIONALE

Although ASA will not make the pain go away, it can help to stop clotting in the arteries, thus reducing damage to the heart. If the victim has their own ASA (acetylsalicylic acid/Aspirin), assist them in taking it provided:

- They are not Allergic to ASA or ibuprofen
- They do not have a history of recent or Active bleeding
- They do not have a history of Asthma
- Their doctor has not Advised Against taking ASA
- They do not have a history of a recent traumatic head injury

Have the victim chew (1) adult ASA tablet or (2) ‘low dose’ ASA tablets. DO NOT substitute acetaminophen (Tylenol) or ibuprofen (Advil/Motrin) as they block the blood-thinning effect of ASA (Circulation Part 15, page S577/Canadian Consensus Guidelines page 3).

If an angina victim is prescribed nitroglycerine, they can take up to 3 doses at intervals of 3-5 minutes provided that their level of consciousness remains good.
Victims should not take nitroglycerine if they have taken performance enhancing drugs within 24 hours.

**VENTILATIONS & CPR**

**KEY MESSAGE**

One a single rescuer situation, a mouth to mask technique is encouraged. For two rescuers, a bag-valve-mask technique is encouraged. For adult victims, rescuers should compress the chest at least 5 cm but no more than 6 cm. “Push hard, Push fast” remains valid for effective CPR. In the 2015 Guidelines “Fast” means 100 to 120 compressions per minute. The Guidelines suggest rescuers aim for 30 compressions in 15 to 18 sec.

**CHANGES IN LITERATURE**

Canadian CPR-HCP Manual
- Circulation (pg. 6)
- Cardiopulmonary Resuscitation chart (pg. 8)
- “Tips for effective CPR” sidebar (pg. 9)

**RATIONALE**

If a single rescuer is required to perform CPR, the mouth-to-mask technique for ventilations is preferred as it is simpler, faster and results in shorter interruptions of chest compressions (Circulation Part 5, page S421/Canadian Consensus Guidelines page 11-12).

In situations where there are a minimum of two rescuers present to support ventilations, the 2 person Bag-Valve-Mask technique is preferred over the 1 person Bag-Valve-Mask method. The 2 person Bag-Valve-Mask technique ensures a good airway, a proper seal of the mask and helps to decrease the risk of gastric distension.

Data collected from 2010 to 2015 reinforces that high quality CPR (to include adequate rate, depth and recoil) improves survival rates (Circulation Part 5, page S419-S420/Canadian Consensus Guidelines page 2 and 9).

A small study found that compression depths exceeding 6 centimeters (2.4 inches) in an adult may be associated with increased rates of non-life threatening injury when compared with compression depths of 5 to 6 centimeters (2.0-2.4 inches). Recent studies suggest that a rate of 100-120 compressions/minute were linked to the highest survival rates. Often, the faster a rescuer compresses the chest, the shallower the compression depth (or they do not allow the chest to fully rise) resulting in a decrease in circulation.
It is important not to confuse compression rate (the speed at which compressions are performed) with compression fraction (the amount of time on the chest during a rescue). In most studies, more time on the chest is associated with higher survival rates. As such, rescuers should minimize the frequency and duration of interruptions (no more than 10 seconds) and maximize time on the chest (a target of 60%). See Appendix B: CPR Process Chart for Health Care Providers.

<table>
<thead>
<tr>
<th></th>
<th>Compression Depth</th>
<th>Landmarking</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult (8 years +)</td>
<td>At least 5cm but not greater than 6cm (2.0 to 2.4 inches)</td>
<td>The centre of the chest on the sternum (Figure 2)</td>
<td>A compression rate of no less than 100/minute and no more than 120/minute for all age groups (30 compressions in 15-18 seconds). Allow the chest to fully recoil or release after each compression (Figure 3). Minimize the frequency and duration of interruptions (no more than 10 seconds) and maximize time on the chest.</td>
</tr>
<tr>
<td>Child (1-8 years)</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (about 5cm or 2 inches)</td>
<td>The centre of the chest on the sternum (Figure 2)</td>
<td></td>
</tr>
<tr>
<td>Infant (0 to 1 year)</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (about 4cm or 1.5 inches)</td>
<td>Two fingers on the lower half of the sternum (one finger width below the nipple line).</td>
<td></td>
</tr>
</tbody>
</table>
**CHILD & INFANT CPR – WITNESSES VS. UNWITNESSED**

**KEY MESSAGE**
In the event that a lone rescuer is in a situation where the nature of a child’s collapse is known, the quick retrieval and access to EMS and AED are the first priority over performing 2 minutes of CPR.

**CHANGES IN LITERATURE**
- Canadian CPR-HCP Manual
  - Early EMS Activation - Step 3: Phone EMS and get AED (pg. 5)

**RATIONALE**
The 2010 guidelines identified that a lone rescuer should perform 2 minutes of CPR on a child/infant prior to activating EMS and obtaining an AED due to the hypoxic nature of most pediatric arrests.
As per the 2015 guidelines, if a lone rescuer witnesses a child/infant collapse they should immediately call EMS and obtain an AED (in a witnessed arrest, there is a high probability that the child/infant is in ventricular fibrillation, as such, the AED will provide the greatest chance of survival).
In the event of an unwitnessed collapse, a lone rescuer will perform two minutes of CPR prior to activating EMS and obtaining an AED as per the previous guidelines (Circulation Part 11/Canadian Consensus Guidelines page 10).
### APPENDIX A: CPR PROCESS CHART FOR LAY RESCUERS

<table>
<thead>
<tr>
<th>Adults (8+ years of age)</th>
<th>Children (1 year to 8 years old)</th>
<th>Infants (&lt; 1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scene Assessment</strong></td>
<td>Check for hazards/ mechanism of injury?</td>
<td></td>
</tr>
<tr>
<td><strong>Recognition</strong></td>
<td>Unresponsive to verbal and painful stimuli (tap or pinch and shout).</td>
<td></td>
</tr>
<tr>
<td><strong>EMS</strong></td>
<td>Lone Rescuer (activate EMS and retrieve AED if immediately available)</td>
<td>Lone Rescuer (2 minutes of care/activate EMS/retrieve an AED if immediately available)</td>
</tr>
<tr>
<td><strong>Assess Airway &amp; Breathing</strong></td>
<td>Open the airway (head-tilt/chin-lift) and look/listen/feel for absent or abnormal (agonal, gasping, severe respiratory distress) breathing for 5 seconds.</td>
<td></td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Begin CPR if breathing is absent or abnormal.</td>
<td></td>
</tr>
<tr>
<td><strong>CPR Sequence</strong></td>
<td>C-A-B (30 Compressions – open Airway – 2 Breaths)</td>
<td></td>
</tr>
<tr>
<td><strong>Compression Rate</strong></td>
<td>No less than 100/minute and no more than 120/minute (30 compressions in 15-18 seconds).</td>
<td></td>
</tr>
<tr>
<td><strong>Compression Depth</strong></td>
<td>At least 5cm but not greater than 6cm (2.0 to 2.4 inches)</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (5cm or 2 inches)</td>
</tr>
<tr>
<td><strong>Compression Ratio</strong></td>
<td>30:2</td>
<td>1 or 2 rescuers</td>
</tr>
<tr>
<td><strong>Compression Interruptions</strong></td>
<td>Allow the chest to fully recoil or release after each compression. Minimize the frequency and duration of interruptions (no more than 10 seconds) and maximize time on the chest. If possible, rotate compressors every 2 minutes. Immediately start CPR after a shock or a ‘no shock advised’ if no obvious signs of life present.</td>
<td></td>
</tr>
<tr>
<td><strong>Airway</strong></td>
<td>Head-tilt/chin-lift</td>
<td>Initially perform a jaw thrust (suspected spinal injury), if air does not go in, reposition with a head-tilt/chin-lift.</td>
</tr>
<tr>
<td><strong>Breathing</strong></td>
<td>Initially provide 2 rescue breaths (1 second breaths - observe chest rise and fall). Take regular rather than deep breaths to prevent gastric distention and/or over inflation of the lungs.</td>
<td></td>
</tr>
<tr>
<td><strong>Defibrillation</strong></td>
<td>Attach an AED as soon as it becomes available.</td>
<td></td>
</tr>
<tr>
<td><strong>Reassessment</strong></td>
<td>Only reassess ABCs on a pulseless victim if life signs are present.</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX B: CPR PROCESS CHART FOR HEALTH CARE PROVIDERS

<table>
<thead>
<tr>
<th></th>
<th>Adults (onset of puberty onward)</th>
<th>Children (1 year to onset of puberty)</th>
<th>Infants (&lt; 1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scene Assessment</strong></td>
<td>Check for hazards/ mechanism of injury?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recognition</strong></td>
<td>Unresponsive to verbal and painful stimuli (tap or pinch and shout).</td>
<td>Lone Rescuer Unwitnessed (2 minutes of care/activate EMS/retrieve an AED)</td>
<td></td>
</tr>
<tr>
<td><strong>EMS</strong></td>
<td>Lone Rescuer (activate EMS and retrieve AED if immediately available)</td>
<td>Lone Rescuer Witnessed (activate EMS and retrieve AED if immediately available)</td>
<td></td>
</tr>
<tr>
<td><strong>Assess Breathing &amp; Pulse</strong></td>
<td>Perform a quick breathing (absent or abnormal) and pulse check for no more than 10 seconds.</td>
<td>Begin CPR if no pulse is present.</td>
<td>Begin CPR if no pulse is present or the pulse is less than 60 beats/min with poor perfusion.</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Begin CPR if no pulse is present.</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (5cm or 2 inches)</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (4cm or 1.5 inches)</td>
</tr>
<tr>
<td><strong>CPR Sequence</strong></td>
<td>C-A-B (start with compressions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression Rate</strong></td>
<td>No less than 100/minute and no more than 120/minute (30 compressions in 15-18 seconds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression Depth</strong></td>
<td>At least 5cm but not greater than 6cm (2.0 to 2.4 inches)</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (5cm or 2 inches)</td>
<td>At least 1/3 the anterior-posterior diameter of the chest (4cm or 1.5 inches)</td>
</tr>
<tr>
<td><strong>Compression Ratio</strong></td>
<td>30:2</td>
<td>30:2 for 1 rescuer/15:2 for 2 rescuers</td>
<td></td>
</tr>
<tr>
<td><strong>Compression Interruptions</strong></td>
<td>Allow the chest to fully recoil or release after each compression. Minimize the frequency and duration of interruptions (no more than 10 seconds) and maximize time on the chest. If possible, rotate compressors every 2 minutes. Apply AED pads during CPR. Immediately start CPR after a shock or a ‘no shock advised’ if no obvious signs of life present.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Airway</strong></td>
<td>Head tilt-chin lift. Initially perform a jaw thrust (suspected spinal injury), if air does not go in, reposition with a head tilt-chin lift.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Breathing</strong></td>
<td>Initially provide 2 rescue breaths (observe chest rise and fall). Take regular rather than deep breaths to prevent gastric distention and/or over inflation of the lungs. 1 rescue breath every 5 seconds (child/infant every 3 seconds).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Defibrillation</strong></td>
<td>Attach an AED as soon as it becomes available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reassessment</strong></td>
<td>ABC reassessment every 2 minutes on a victim with a pulse. Only reassess ABCs on a pulseless victim if life signs are present.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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