Heart and Stroke Foundation of Canada

Position Statement

PUBLIC ACCESS TO AUTOMATED EXTERNAL DEFIBRILLATORS (AEDs)

FACTS

- Cardiac refers to the heart. Arrest means stop. Sudden cardiac arrest is the sudden and unexpected loss of heart function in a person.
- Signs of cardiac arrest include: no breathing, no movement or response to initial rescue breaths, and no pulse.
- In Canada, 35,000 to 45,000 people die of sudden cardiac arrest each year.[1]
- An automated external defibrillator (AED) is a device containing sophisticated electronics used to identify cardiac rhythms, and to deliver a shock to correct abnormal electrical activity in the heart. An AED will only advise the individual using the device to deliver a shock if the heart is in a rhythm which can be corrected by defibrillation.
- AEDs are safe, easy to use, and can be used effectively by trained medical and non-medical individuals. Trained responders have effectively used AEDs in many public settings, including casinos, airport terminals, and airplanes.[2-4] Trained laypersons can use AEDs safely and effectively.[5]
- An AED is an efficient and effective means of achieving rapid defibrillation in both the out-of-hospital and in-hospital setting.
- For every one minute delay in defibrillation, the survival rate of a cardiac arrest victim decreases by 7 to 10%. After more than 12 minutes of ventricular fibrillation, the survival rate of adults is less than 5%.[6]
- Currently there is insufficient evidence to support a recommendation of whether or not to use AEDs for children less than 1 year of age.

RECOMMENDATIONS

The Heart and Stroke Foundation of Canada recommends that:

Canadians

1. Have widespread access to automated external defibrillators.
2. Be trained and encouraged to apply cardiopulmonary resuscitation (CPR) and AED skills when needed.
3. Who are targeted responders be authorized, trained, equipped and directed to operate an AED if their responsibilities require them to respond to persons in cardiac arrest.

Governments

4. Establish provincial regulations or legislation to ensure immunity of the overseeing physician and responders from liability, excluding gross negligence or willful misconduct.

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Training Agencies

5. Ensure that AED programs meet or exceed guidelines for AED and CPR training established by the Heart and Stroke Foundation of Canada (HSFC).
6. Consider the use of a medical director for Instructor or Instructor Trainer courses. A medical director may not be required for AED provider courses.

Pre-hospital Planners and Providers

7. Advocate for strengthening the Chain of Survival™ and ensure access to AEDs by responders in all Canadian communities. In the future, efforts to expand the use of AEDs by the general public may be warranted.
8. Plan for early defibrillation initiatives to be implemented within the community Chain of Survival™.
9. Include AED programs as part of comprehensive emergency response plans that are linked with the emergency medical services system, and implemented within systems which provide transfer of care protocol, medical oversight, training, continual readiness, quality assurance, data collection, and evaluation.
10. Follow provincial guidelines for physician oversight for AED programs where such guidelines have been established. Where no guidelines exist, a physician should, at minimum, establish the AED protocol, review the conduct of each resuscitation attempt and make recommendations for improvement. Physicians overseeing emergency medical services (EMS) programs are well placed to perform this review.

Hospitals

11. Examine policies and procedures for cardiac arrest and resuscitation to ensure that the time to defibrillation using AEDs within the hospital setting is as short as possible. In settings where professionals trained in advanced cardiac life support are not immediately available (less than three minutes from arrest to defibrillation), AED training should be provided as a basic skill for healthcare providers.

BACKGROUND

Arrhythmias (abnormal heart rhythms) such as ventricular fibrillation cause most sudden cardiac arrests. Early defibrillation is the intervention that is most likely to improve survival rates. The time between the onset of cardiac arrest and the use of an AED is the major determinant for success of the resuscitation attempt. While CPR helps to maintain circulation and ventilation in a victim of cardiac arrest for a short period of time, it is unlikely to convert ventricular fibrillation to a normal heart rhythm. Restoring a normal heart rhythm requires defibrillation to be provided within a few minutes of the arrest.

If an AED is immediately applied to a victim of cardiac arrest due to ventricular fibrillation, the likelihood of survival is high. Survival rates in cardiac rehabilitation programs that provide defibrillation within the first few minutes after a cardiac arrest are higher than 85%.[7] With each passing minute from the time of the arrest, the probability of survival declines about 7% - 10%.[6] Studies show that few patients survive if the time from collapse to defibrillation is greater than 12 minutes.[8,9] If CPR is performed from the time of collapse to the time the defibrillator arrives, survival may be possible after a longer time interval. Therefore, the HSFC supports efforts to provide prompt defibrillation to victims of cardiac arrest.

Defibrillation is a key link in the Chain of Survival™. The Chain of Survival™ consists of a series of seven links that give the victim of a medical emergency the best chance of living. These links are:

- Healthy choices;
- Early recognition;

- Early access to emergency care;
- Early CPR;
- Early defibrillation;
- Early advanced cardiac care; and
- Early rehabilitation.

All links in the Chain of Survival™ are important to reduce death and disability from heart disease and stroke.

The Chain of Survival™ is only as strong as its weakest link. The success of each link depends on the link immediately before and after. Recognizing the warning signals of cardiac arrest and reacting by rapid notification of the EMS system (by calling 9-1-1 or other emergency response number), helps to get the AED to the victim quickly and reduce delay to defibrillation.

Almost all clinical studies have shown that bystander CPR can help to improve survival rates. Bystander CPR is the best treatment that a cardiac arrest patient can receive until a defibrillator and advanced medical care arrive.[7] CPR training teaches Canadians how to recognize the signals of a heart attack and cardiac arrest, how to react, and how to provide CPR until EMS arrive, shortening the time to defibrillation.

Early Defibrillation

Targeted Responders in the Community

HSFC recommends that targeted responders be authorized, trained, equipped, and directed to operate an AED safely and effectively. A targeted responder is any person who, as a part of their job description as a professional primary health care provider or a professional first responder, has the duty to respond to a medical emergency. Targeted responders may include any healthcare provider, or any first responder whose occupation or volunteer activities demand proficiency in the knowledge and skills of basic life support (BLS).

Lay Responders

Lay responders in facilities with a high likelihood of a cardiac arrest event (1 every 2 years) can also be effective. The Public Access Defibrillation (PAD) trial demonstrated a doubling of survival rates (from 15% to 30%) in facilities with high likelihood and with trained staff always available.[5] All facilities with a high likelihood of cardiac arrest should incorporate AED programs into more comprehensive emergency response plans.

In-hospital

The concept of early defibrillation can be applied to the in-hospital resuscitation setting. The goal of early defibrillation in-hospital is a collapse-to-shock interval of less than 3 minutes in all areas of the hospital and ambulatory care facilities.[7] AED technology poses unique opportunities for in-hospital resuscitation. Hospitals are encouraged to examine their policies and procedures for cardiac arrest and resuscitation to determine if use of AEDs within the hospital setting could reduce time to defibrillation. In settings where professionals trained in advanced cardiac life support are not immediately available, AED training should be provided as a basic skill for healthcare providers. AEDs should be made readily available in strategic areas throughout hospitals to help reduce the time from collapse to defibrillation.

Unique Situations

Current data suggests that AEDs are an effective intervention for sudden cardiac arrest and may be an effective intervention in settings where there is a high likelihood of cardiac arrest such as airports, casinos, commercial aircraft cabins and in other settings where large numbers of high-risk adults may be located.[2-6]

Defibrillation is effective only if performed shortly after cardiac arrest. Urban and rural communities need to determine the degree to which they are capable of getting an AED to a victim of cardiac arrest in time for resuscitation efforts to be effective, and consider placement of AEDs where the chance of ambulance response is low, such as on ferries or airplanes.

Access to Defibrillation

HSFC encourages widespread access to AEDs in Canada. In some provinces, enabling legislation and regulatory changes may be required. HSFC recommends that early defibrillation programs operate within systems which:

- integrate basic life support and/or advanced cardiac life support training with AED training, as appropriate;
- integrate the provision of AEDs within the health care system and establish linkages with the EMS system;
- consider the response time of the local EMS system when acquiring and placing AEDs in a community and/or workplace;
- place the program within the medical oversight of a physician and ensure immunity of the overseeing physician and responders from liability;
- establish a system of quality assurance to include the review of all clinical events when an AED is used;
- include a mechanism for data collection, evaluation, and reporting of outcomes;
- comply with accepted guidelines for training and retraining;
- enhance public awareness of the role of early defibrillation in cardiac arrest; and
- receive training from an accepted and recognized training agency.

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