COMMITTEE OF THE WHOLE JUNE 18, 2001

INTERIM REPORT ON PUBLIC ACCESS DEFIBRILLATION

Recommendation

The Fire Chief recommends:

1. THAT the interim report of the Fire Chief regarding Public Access Defibrillation be received;

2. THAT the Fire Chief pursue discussions with the Regional Municipality of York Health Services / Emergency Medical Services and the Base Hospital Program Director, regarding partnership opportunities in the proposed 'Heart Alive' Public Access Defibrillation program; and

3. THAT the Fire Chief submits a final report to a future Committee of the Whole meeting regarding Public Access Defibrillation.

Purpose

Council, on May 14, 2001 endorsed Item 30, Presentation – Mr. Blake Hurst, with respect to Community Access to Defibrillation, Committee of the Whole, Report No. 36:

"THAT the presentation…be received and referred to staff for a report…respecting the benefits of introducing the Community Access to Defibrillation program in the City of Vaughan."

Background - Analysis and Options

Sudden Cardiac Arrest (SCA)

Every year, several thousand people in Ontario die of a sudden cardiac arrest (SCA). Most sudden cardiac arrests are caused by a disturbance in the heart's electrical system. It is common knowledge that when electricity touches muscle it contracts. As an organ made primarily of muscle, the heart is no different--in fact, electrical impulses are responsible for telling the heart when and how quickly to contract, thus sending blood throughout our bodies. When this system malfunctions, lethal cardiac rhythms can occur. Statistics show that most of these people who are in sudden cardiac arrest are in ventricular fibrillation--a state where the heart muscle itself quivers and does not pump blood. Victims collapse and quickly lose consciousness, often without warning. Unless normal heart rhythm is restored, death follows within a matter of minutes. Cardiac arrest is the single leading cause of death in Canada and often strikes without warning.

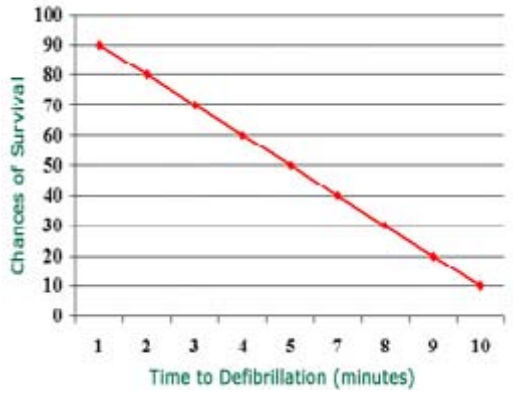
Cardiopulmonary Resuscitation (CPR)

While cardiopulmonary resuscitation (CPR) can maintain circulation for a very short period of time after a sudden cardiac arrest occurs, early defibrillation (or electric shock), if administered within a few minutes, is the only intervention that can convert ventricular fibrillation into a normal heart rhythm. Every minute that the defibrillation is delayed results in a 10% decrease in surviving the sudden cardiac arrest.

Time is Critical

During a cardiac arrest, a person's heart stops and that means that every second counts. Most people know that chances for survival increase with early CPR. What most people do not know is that for every minute that the patient is not defibrillated, chances of survival decrease by 10

percent. The challenge for our community is to attend to sudden cardiac arrest victims, defibrillator in hand, within minutes.



Automated External Defibrillator (AED)

AED stands for *automated external defibrillator*. A defibrillator is a medical device that delivers an electric shock to a patient's chest, which in turn passes through the heart. This is done to terminate lethal cardiac rhythms and cause the heart to resume normal pumping activity.

AEDs are called automated because they take the decision to deliver a shock out of the hands of rescuers and place it in an internal computer chip. Audible prompts tell the rescuer what to do, from attaching electrodes to the patient's chest to pushing a button to deliver a shock.

AEDs have been commercially available for the past ten years. Early units were large and expensive and hampered by regulatory issues. Designed for use by hospitals and ambulances, these devices never entered the public market.

In the early 90s things began to change. Manufacturers debuted the first new generation AEDs--ones that were light, inexpensive and easy for properly trained laypersons to use.

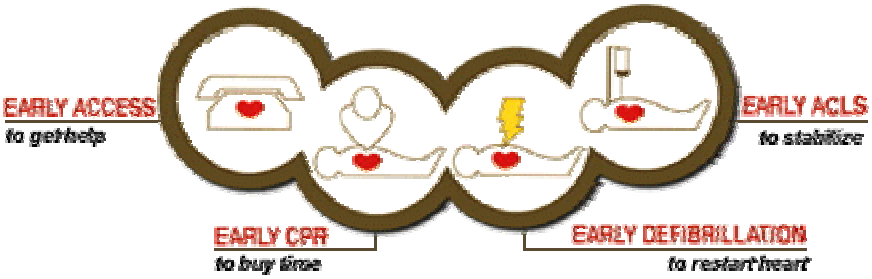
Today's AED can weigh as little as 4 pounds and are as portable as they are automated.

This is all good news for cardiac arrest victims! With proper training a person can learn to use these simple devices and really make a difference.

The Chain of Survival

Working to strengthen the "Chain of Survival" in the community, together with the existing Emergency Medical Services response system, trained citizens can improve cardiac arrest survival.

When a heart stops beating, for whatever reason, early intervention can often get it going again and save a life. The following four links, referred to as "The Chain of Survival" are critical to ensuring the survival of an individual who experiences cardiac arrest.



1. Early Recognition and Access to 911: Recognition of the signs and symptoms of an impending cardiac arrest and calling 9-1-1.
2. Early CPR: Performing CPR keeps vital organs alive until medical help is available.
3. Early Defibrillation: Automated External Defibrillators (AEDs) that deliver an electric shock in order to restart a fibrillating heart back to a normal rhythm.
4. Early Advanced Life Support: Paramedics on our ambulance service.

Each link in the chain depends on the successful completion of the previous link.

AEDs are very important to the chain of survival. With AEDs on-site, survival rates for anyone who suffers cardiac arrest are significantly increased. When site-staff or volunteers are trained in AED use, they are actually trained to complete the first three of the four links in the chain of survival. Training includes recognition of the signs of a heart trouble, (Link 1), CPR (cardiopulmonary resuscitation) (Link 2) and, of course, automated external defibrillation (Link 3).

The Heart Alive (also known as: 'Heart Safe City' or 'Cardiac Safe City') program enhances the pre-hospital emergency medical services response to citizens who experience a sudden cardiac arrest. The program encourages the purchase of Automated External Defibrillators (AEDs) for public facilities and various work places and the training of staff or volunteers required to use these life-saving devices.

Many Canadian cities recognize the value of adding AEDs to the ambulance and fire emergency response systems. The City of Ottawa has recently announced that all marked police cars will be equipped with an AED and trained police officers will now be able to better help cardiac-arrest victims.

The City of Ottawa also purchased over 300 AEDs for properties such as community centres and public pools. The City will ensure that staff and volunteers in each location are trained on defibrillators and taught Cardio-pulmonary Resuscitation (CPR).

The cities of Toronto, Mississauga, Vancouver and Calgary are just a few of the many cities implementing similar programs.

Vaughan Firefighter Defibrillation Program

In 1998, Council endorsed the Vaughan Firefighter Defibrillation Program under the auspices of the York Region Base Hospital Program Medical Director, in that funding was provided to purchase the automated external defibrillators for every emergency response fire apparatus in the City of Vaughan and to train Vaughan's firefighters in the operation of the new equipment.

The program included the establishment of a Defib Program Coordinator/Liason officer, as a portion of the job function of the fire department Training Officer position. Several Vaughan firefighters are cross-trained as Firefighter Defib Instructors and now conduct all of the in-house firefighter defib training courses, monthly practice/review sessions and annual re-certification

testing, under the supervision of the Defib Program Coordinator, who must also liaise with the Base Hospital Program Manager, as per the Agreement between the City of Vaughan and Markham Stouffville Hospital (Base Hospital Program).

At that time, Council also endorsed the recommendation to pursue discussions with the District Health Council on the establishment of an initiative to encourage public participation in citizen CPR training programs. Since then, there have been changes in the structure of the District Health Council and resulting less-participation in such programs in the local areas. However, such a Citizen CPR program is understood to be within the interest and mandate of the Region's recently created Emergency Medical Service, and may now be expanded to include the newest concept of publicly placed automatic defibrillators.

'Heart Alive Program'

Management of the York Region Emergency Medical Service (EMS) has advised that the EMS 2001 Business Plan includes the provision of resources to coordinate the Heart Alive Program, ensuring that the stakeholders are brought together to develop a program that will provide guidance, education and program support to the community in the areas of:

Chain of Survival including EMS access;
CPR/Defibrillation training; defibrillator equipment;
Defibrillator placement target areas;
EMS system integration; and,
Quality Assurance initiatives.

The role of York Region EMS will be primarily coordination. As there are more-and-more private businesses / organizations providing public access defibrillation programs, the goal will be to ensure programs have been standardized and endorsed by the medical authorities prior to implementation, etc.

York Region EMS anticipates presenting the 'Heart Alive' program to Regional Council for approval in the fall of 2001.

Public Access Defibrillation (PAD)

The objective of the PAD program is to train targeted "first responders" to use an AED on victims of Sudden Cardiac Arrest (SCA). A first responder is someone who, at minimum, has received first aid, CPR, and AED training. They are "targeted" because they are the staff that would respond in their work site in the event of an emergency. With early recognition, early access to 911 and initiation of CPR, a targeted responder can save a life!

Impact

The ensuing discussions will establish criteria for recommended locations for new AEDs in the community. Similar to Ottawa, the City of Vaughan may eventually consider the installation of AEDs in City-owned public buildings. The financial impact would include equipment purchase, maintenance agreements, testing, re-capitalization and training costs, which would include staff time, instructor fees and certifications.

Although the existing fire department Training Officer is responsible for general firefighter and officer training programs and first aid, CPR and Defib training within the department, the additional role of Heart Alive program coordinator and consultation, etc., with local AED sites, Base Hospital and York EMS, would likely require one 'full time equivalent' complement position for the emergency medical programs. Given that 50% of the emergency response call volume is to rescue/medical emergencies, the increased staff resource may also be appropriate.

The final report would address the various operational and funding impacts of various degrees of participation in the proposed Heart Alive program.

Conclusion

Defibrillation by lay responders / bystanders is on the horizon and it has the potential to increase survival after sudden cardiac arrest.

A partnership with the Emergency Medical Services and the Base Hospital Program with its physician supervision is vital in establishing medically sound defibrillation protocols, transfer of patient care, preservation of clinical data and continuous quality improvement programs.

CPR performed by bystanders, in addition to early defibrillation, is essential if survival rates are to be improved. Given the potential for public-access AED programs to save lives, the City of Vaughan should cautiously embrace their promotion. These programs must be implemented under the supervision of responsible medical personnel to ensure integration with emergency medical service responders (e.g., paramedics, firefighters, police), who ultimately become responsible for every patient treated under a public access AED program. Only then can the public be assured that AED use by lay people is safe and effective.

Manufacturers of public access defibrillation equipment have been hurrying to provide a "fire extinguisher" type of defibrillator that is quick and easy to apply. This would accurately determine cardiac rhythm and deliver appropriate energy safely and effectively. The manufacturers claim the current generation automated external defibrillator (AED) is such a machine. Over the last decade it has been used effectively by trained first responders such as paramedics and firefighters, and is now poised to enter the marketplace for public use in cardiac resuscitation.

Early defibrillation can save someone's life!

Links

http://www.cardiacsafecity.org

http://www.city.mississauga.on.ca/commsvcs/fire/html/pad.htm

http://www.gov.calgary.ab.ca/EMS/aed.htm

http://www.city.vancouver.bc.ca/fire/about/padtrial.html

http://www.ottawa.on.ca/city_services/emergencyserv/5_1_2_en.shtml

Respectfully submitted,

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