

PUBLIC ACCESS DEFIBRILLATION RESPONDER (PAD-R)



Public Access Defibrillator On-Site

ACTIVITY GUIDE



Second Edition 2005

Medcontrol Consultants Inc. - Public Access Defibrillation (PAD-R) Activity Guide
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Corporate Introduction

Medcontrol Consultants Inc. (MCI) has been committed to strengthening the “Chain of Survival” since its inception in 2000. MCI provides a complete corporate turnkey solution offering: consultation, training and medical direction. MCI expertise is in the fields of Medical and Legal Risk Management. Medical program design and implementation are the cornerstones of MCI.

Programs

Medcontrol Consultants Inc. has developed a variety of programs, which meet or exceed current provincial guidelines.

To meet the growing challenges facing emergency health response services in Ontario, many municipalities are expressing an interest in introducing a rapid defibrillation program in their community through Public Access Defibrillation Responders (PAD) and First Responder (FR) services. As CPR and defibrillation work in tandem, a high percentage of cardiac arrest victims can be saved if reached within a reasonable time. PAD and FR programs are not designed to replace existing paramedic/ambulance personnel but to augment the existing EMS system by decreasing time to the provision of defibrillation and therefore improve survival rates.

The 2001, Heart and Stroke Foundation of Ontario (HSFO) convened an Automated External Defibrillator (AED) Advisory Committee and in 2002 convened the Experts Guideline Committee, to create the AED guidelines for prehospital Defibrillation programs. Officers of Medcontrol Consultants Inc. were invited to help form and create the recommendations and the guidelines as part of these committees.

Program Prerequisites/ Pre-course Required Reading

Entry into PAD-R courses will be based on having certification in CPR, following the Heart and Stroke Foundation of Ontario (HSFO), Basic Cardiac Life Support (BCLS) Guidelines (Level A). You will be required to provide proof of certification and demonstrate proficient skills in basic life support. Defibrillation is a separate skill beyond basic training requiring special instruction. Review Heart Saver or Basic Rescuer CPR Guides. CPR works in tandem with Defibrillation. The PAD-R course builds on your existing CPR skills and knowledge base.

Medical Director

Dr. J.C. Fedoruk, BA, LLB, MD, CCFP (EM), FACEP, FCLM, DABAM, was one of three medical directors that pioneered Public Access Defibrillation programs in Canada, and the first to introduce PAD programs in Ontario. He is considered the authority on PAD legal risk management issues in Canada, as is an expert in establishing guidelines for medical programs whether in the Public or Private Sectors of Ontario.



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Course Overview and Introduction

Overview

The goal of the **Public Access Defibrillation –Responder (PAD-R)** course is to provide any individual who may be required to respond to a cardiac emergency as part of a workplace On-Site Defibrillation program, with a logical approach to confidently manage the emergency in a safe and efficient manner to increase the chances of survival for the victim in cardiac arrest. **This program complies with and exceeds the Heart and Stroke Foundation of Ontario (HSFO), AED Guidelines established in 2002.**

Introduction

According to the Heart and Stroke Foundation of Canada (HSFC), every year there are 35,000–40,000 deaths in Canada due to sudden cardiac arrest (SCA). Currently, only 5% of these victims survive; the HFSC expects up to 30% of the victims could be saved if access to defibrillation is introduced into a strong community or workplace, and if defibrillation occurs quickly following the SCA event. Placement of automated external defibrillators (AEDs), within PAD programs can shorten the time from collapse to first shock for the victims in cardiac arrest thereby improving the chances of survival.

Your place as the PAD-Responder (PAD-R)



Saving a life requires a combination of responders and citizens with a variety of skills and knowledge. Fire and Ambulance services normal referred, as the Emergency Medical Services require quick intervention in cardiac arrest emergencies to be effective. You the PAD-Responder will become the initial and critical link in the chain of survival.

Legal Aspects of Automated External Defibrillators (AED's)

Currently in Ontario defibrillation is considered to be a medical act. This means that corporations, workplaces or venues that place an AED on-site must ensure compliance with the Heart and Stroke Foundation of Ontario, AED guidelines.

HSFO AED Program Guidelines (2002)

- AED's should be made available within 5 minutes in every workplace and community.
- Every AED program must have:
 - A Medical Director
 - Emergency response protocols
 - Program policies and procedures
 - AED responders

“Remember Saving Lives is Everyone’s Business”

The Chain of Survival

The chain of survival was created by the emergency medical community as the symbol of the events that need to occur in pre-hospital emergency cardiac care (ECC).



(Circulation, Heart and Stroke Foundation of Ontario)

1. **Healthy Heart Choices**
2. **Early Recognition of the Symptoms**
3. **Early Access to 911** (call first, call fast)
4. **Early CPR** (individuals attempt CPR only 15% of the time after calling 911 for help, identified in a multi-city study conducted in Ontario). When approximately 75% of cardiac arrests occur in the home, public education is the key to strengthening the early CPR link. The more individuals trained in CPR, the more likely that CPR may be started and continued until a trained and certified PAD-R arrives.
5. **Early Defibrillation** (In a six year study conducted in Southwestern Ontario (Windsor, Essex County and Chatham-Kent) over 15% of cardiac arrests occur in public locations, the top locations to suffer a cardiac arrest were identified;
 - Casinos,
 - Medical Facilities,
 - Industrial/ Manufacturing Sites (medium and large size),
 - Shopping Centres/Malls,
 - Bingo Halls,
 - Civic/ Fraternal Halls,
 - Golf Courses.

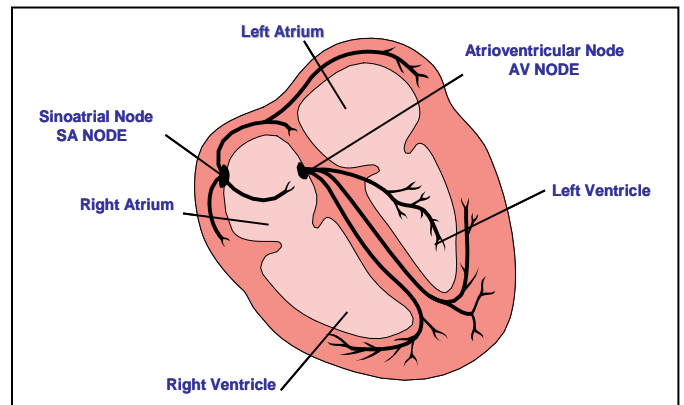
Public Access Defibrillation (PAD) programs have been shown to have the biggest impact in increasing your chances for survival rate after suffering a cardiac arrest. In a five-year survival rate comparison study between the Greater City of Windsor and the Casino Windsor Limited, the survival rate for out of hospital cardiac arrests in the Greater City of Windsor (with both firefighter, primary and advanced care paramedics defibrillation programs) was 5.5% versus a survival rate of 65% for the on-site Defibrillation program at the Casino Windsor Ltd. The key to the success of the Casino Windsor On-Site Defibrillation program was the ability to reduce the time from collapse to first shock from a defibrillator.
6. **Early Advanced Care** (access to Advanced Care Paramedics and Emergency Room Personnel)
7. **Early Rehabilitation**

Anatomy and Physiology

Cardiac Structure

The heart is divided into left and right sides that are separated by a muscular wall called the septum. Each side is further divided into upper chambers (**Atrium**) and lower chambers (**Ventricle**).

The stimulus for the heart muscle to contract is involuntary and comes from its own electrical system. The **Sinoatrial (SA) Node**, known as the heart's natural pacemaker is located in the right atrium. Impulses from the SA Node are sent out at a rate between 60 to 100 per minute. The impulses spread through the muscle fibres causing them to contract and pump blood.



Without the electrical signal the heart will not pump blood.

The impulses travel from the SA Node through the muscle to the **Atrioventricular (AV) Node** located on the junction between the left and right sides of the heart.

Electrocardiograms (ECG) -An ECG is a measurement of the electrical activity in the heart. The following ECG's form part of the knowledge base of the Public Access Defibrillation Responder (PAD-R) program.

Normal Sinus Rhythm (NSR) -A ECG of an organized, uniform rhythm of a healthy heart



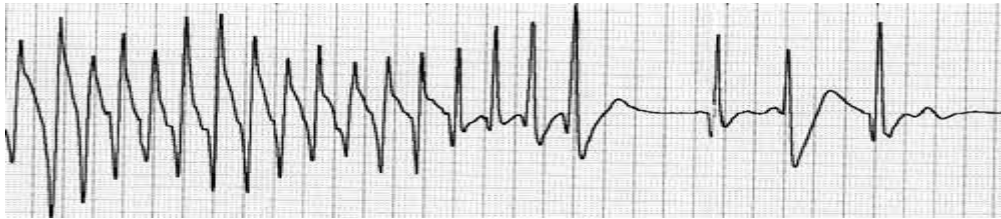
Electrical problems affecting the heart rate or rhythm are called dysrhythmias and may impair the ability of the heart to pump blood effectively. There are numerous causes of dysrhythmias, which include:

- Coronary Heart Disease
- Trauma to the heart
- Hypothermia
- Central Nervous System damage
- Oxygen deficiencies
- Electrocutation
- Chemical imbalances
- Drug and medications

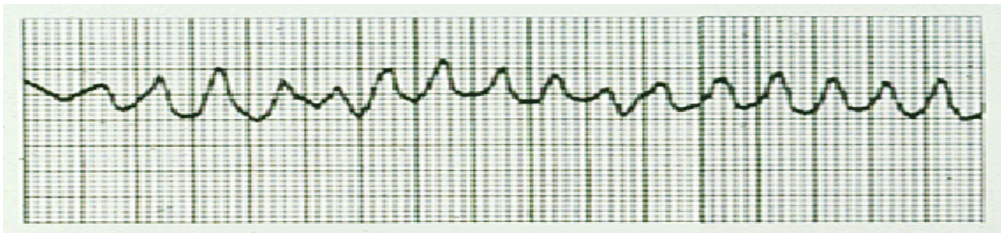


Common Types of Dysrhythmias

Ventricular Tachycardia (VT) -A abnormal contraction of the ventricles that lead to ventricular fibrillation and sudden death

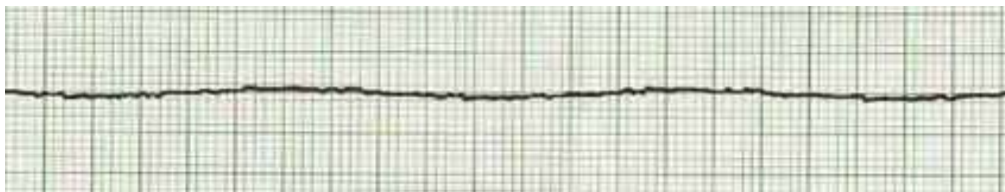


Ventricular Fibrillation (VF) -A chaotic heartbeat that often precedes cardiac arrest



When the heart is in fibrillation, there is no effective blood being supplied from to any part of the body, breathing stops and cardiac arrest occurs. The most common heart rhythm at the beginning of a cardiac arrest is V.F.

Asystole (flat line) –This dysrhythmias cannot be treated with electrical shocks from AEDs.





Public Access Defibrillation and its Importance

Understanding where cardiac arrests occur with frequency has been the subject of several studies across North America. During a six-year (1994-2000) study conducted within several communities in Ontario, cardiac arrests occurred in the home 73% of the time, while occurring in public locations slightly over 15% of the time. Planning for placement of defibrillators in high-risk areas could help increase community survival rates.

Research shows that 5-6 minutes after collapse approximately 50-60% of patients are still in VF. The only effective treatment for VF is defibrillation. Defibrillation is a process in which an electronic device is used to stop a fast, chaotic heart rhythm by delivering an electrical shock to the heart. The goal of defibrillation is to reorganize the chaotic electrical activity of VF/VT and return the heart to a NSR. Automated External Defibrillators will only shock VF/VT. Depending on the response time of the emergency system, a number of lives could be saved. The Ontario Prehospital Advanced Life Support



A survival study at the Casino Windsor identified the average time to initial shock was 7 minutes and VF/VT was the presenting rhythm in 91% of the cases. CPR was administered until the arrival of the Defibrillator in these cases, which could account for the high number of patients presenting in VF/VT.

Management of the Cardiac Arrest Patient

Step 1: Anticipation/Planning

A defibrillator checks sheet **must** be filled out and signed daily. Survey findings suggest that these checks are the single most important factor in preventing defibrillation failures due to equipment malfunctions.

Operator's Daily Checklist LIFEPAK® automated external defibrillator		Month of _____, 20__
Unit Serial No.:	_____	Date
Location of Unit:	_____	Initials
INSTRUCTIONS	RECOMMENDED CORRECTIVE ACTION	INSERT A CHECK MARK IN BOX WHEN COMPLETE
1. Examine the AED case and connectors:		
Foreign Substances	Clean the device	<input type="checkbox"/>
Damage or Cracks	Contact authorized service personnel	<input type="checkbox"/>
2. Check expiry date of QUICK-COMBO electrodes.		
	Replace if expired or opened	<input type="checkbox"/>
WEEKLY CHECKS ONLY		WEEKLY CHECKS ONLY
3. Perform download procedure to review and possibly download stored calls if applicable.		
	Use printer or Data Transfer or Code-stat Program	<input type="checkbox"/>
4. Ensure TIME & DATE on defibrillator are within 10 seconds of established time source.		
	Use official time clock	<input type="checkbox"/>
5. Examine the battery pins for bending or discoloration.		
	Discard and replace battery	<input type="checkbox"/>

1. Prepare and inspect resuscitation equipment. Inspection records must be kept and made available for site inspections. The LifePak 500 or the CR Plus Defibrillator with pocket mask and gloves must be brought on all possible cardiac emergencies.



2. Responders should anticipate the upcoming arrest and mentally visualize your roles and actions. Responders should participate in the six-month cardiac arrest drills or review workbook or electronic learning tools. Age appropriate electrodes should be reviewed if applicable.

Step 2: Scene Entry/Placement

1. Ensure **911** is notified, giving details to the nature of the emergency and provide access details, such as which level, entrance or gate information.
2. Pinpoint the exact location of the patient at the scene. Allow for Fire or EMS access to the scene. Observe any environmental hazards such as pools of water or flammable gases or liquids.
3. Bring the lifesaving equipment (defibrillator with pocket-mask/gloves) to manage the cardiac arrest to the patient's side.
4. Position the patient for effective CPR and defibrillation. Ideally, place the defibrillator close to the patient's head.

Step 3: Assess Patient (ABCs) (Adult/Child)

Verify the patient is unconscious. (Remember to put gloves on and use a pocket mask to give ventilations)

Airway:

- Open airway, head tilt/chin lift.
- Look, Listen and Feel for breathing. (no longer than 10 seconds)



Breathing:

- Breathing normally? No?
- Give 2 ventilations with pocket mask. (Only perform mouth-to-mouth on family or friends)



Circulation:

- Look for normal signs of circulation. (chest rising/falling, breathing)
- Check for carotid pulse? (no longer than 10 seconds)
- Start cardiac compressions. Adult (15 compressions: 2 ventilations) until defibrillator arrives.
Child (5 compressions: 1 ventilations)



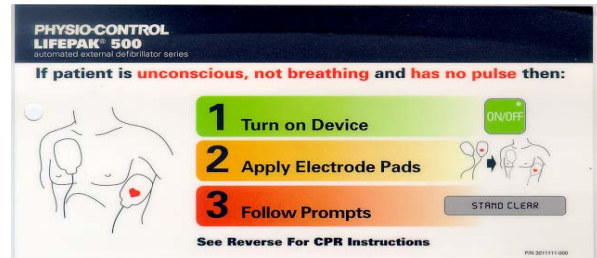
“Time is the Crucial Factor in Survival”

Step 4: Prepare Patient/Turn Unit On

- Turn the defibrillator on by firmly pressing the “ON/OFF” button or opening the lid, attach the electrodes if necessary.
- Expose the patient’s chest by moving /or removing the clothing.
- Wipe the chest dry if necessary (cardiac arrest victims are often sweaty). Remove any patches on the chest where the electrodes will be placed (remember to have latex type gloves on).

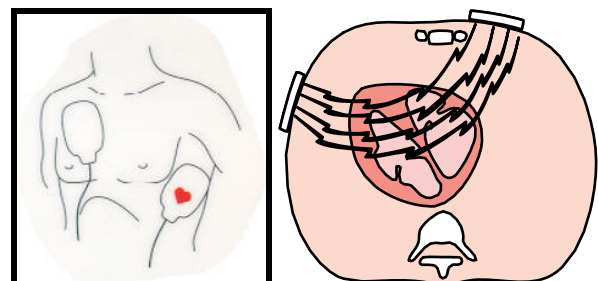
Notes:

- Improper pad placement and poor adhesive contact are the **most common errors** in pre-hospital defibrillation.
- Place electrodes **1-2 inches** away from pacemakers or implantable defibrillators, which are placed under the skin.
- Improper positioning, electrodes not plugged in or poor connection of the electrodes will result in either:
 - An error message of “**CONNECT ELECTRODES**” signal from the AED.
 - Less energy delivered to the heart muscle, lowering the chances for a successful defibrillation.
- **Motion Detected** – due to patient movement, CPR, ventilations or electrode/cable movement.



Correct Adult (8years and up) Electrode Placement: see page 14 for information on children electrodes.

1. Open the packaging for the adhesive pads, remove both electrodes.
2. Peel off the adhesive backing prior to placement of each pad.
3. Position each pad correctly on the chest using a rolling motion to expel air under the pad.



Adapted from Medtronic Physio Control, Early Defibrillation, Training and Implementation Guide



This placement ensures correct "positioning" of the patient's ECG signal into the monitor circuitry. Keep in mind that the person doing CPR must briefly move his hands while the pads are being positioned and placed. Taking the additional time to shave chest hair at the pad sites may not be worth the effort, as every second counts.



Certified PAD Responders, will be responsible to know and follow the Medical Directors Standing Order whenever they use the AED on a cardiac arrest patient.

Step 5: Defibrillation

- On all possible cardiac emergencies, bring defibrillator with pocket mask/gloves.
- Confirm ABC's and if patient is unconscious, not breathing and has no pulse proceed to step 3. If a Second Responder is available to provide assistance, begin CPR, while proceeding to step 3 for Vital Signs Absent (VSA) patient.
- Turn AED on, attach proper (age guideline) electrodes and follow AEDs visual and verbal prompts. **Clear any bystanders, from the patients' immediate area. Ensure responders are clear.**
- If **"Shock advised"** Announce and verify **"I'm Clear"** **"Everyone's Clear"** then defibrillate. (Note: the defibrillators default settings will attempt to shock a patient in stacks of three) After 3rd shock, check patient's vital signs. If still VSA, then do CPR for one minute and follow prompts.
- If at anytime during step 4, there is a **"No Shock Advised"**, then check patient pulse. If no pulse, resume CPR for one minute and follow instructions. Continue with these protocols until Fire or EMS arrival.
- If patient has a pulse, follow rescue breathing rates and check vital signs frequently until Fire or EMS arrival.
- If vomiting occurs during any step, clear the airway (finger sweep) patient as needed.
- **If the AED is analyzing or is in the shock protocol, you are still in charge of patient care working under physician directives.** Transfer of care to Fire or EMS on their arrival when the "No Shock Advised" message appears or if you are performing CPR.
- Provide a verbal report to Fire or EMS and provide a written/electronic Medical Assist Report (MAR) to Medical Director following the call for auditing.
- Restock used equipment immediately to ensure program readiness.



Step 6: Patient Stabilization/Maintenance

If a palpable pulse and respirations return, maintain a good airway, be prepared for the possibility of return to cardiac arrest and refrillation at any point. To date, available evidence indicates that refrillation is likely to occur in greater than 25 percent of patients. Check pulse frequently while ventilating the patient. Vital signs that appear stable now, were not even there moments ago! Leave the defibrillator pads in place and connected. Observe the patient closely!

Step 7: Privacy/Confidentiality

Even though the primary concern of the pre-hospital defibrillation team is the patient, it is both appropriate and necessary to communicate effectively with the other people at the scene: emergency services personnel and direct family. Honour and respect the patient's and families right to privacy. Do not discuss any patient treatment details with friends, co-workers, neighbours or the media.

Step 8: Submission of Reports

1. Any responses where the patient is Vital Signs Absent a Medical Assist Report (MAR) must be completed and submitted.
2. The MAR is completed and submitted to the MCI for review by the Medical Director. The importance of complete and accurate documentation to the success of the PAD Responder program cannot be overemphasized.
3. Download AED information via transfer to computer, printer or modem cable and send to your Medical Director. (refer to your program policy for this step)

Medical Assist Report

SECTION I. Agency Information

Run Date: 03/11/2004 Agency: [] Station: []

Incident No. [] Nature of Dispatch []

Apparatus No. [] Total Number of FD units on scene: 1

Responder 1 [] Responder 2 []

Incident Commander [] Responding from []

SECTION II. Call Information

LOCATION OF CALL (Street & Apt #) []

DISPATCH TIMES

Recd. Call: 00:00:00

EMS INFORMATION

Ambulance Run No. []



Troubleshooting and Safety Issues

PAD-Responders must learn to recognize situations where it is not safe or appropriate to use the AED. Strict adherence to all protocols and familiarity with the LP500 and or CR Plus operating manual is absolutely essential when using this equipment.

The defibrillator is to be used by trained and currently certified personnel only, acting as part of this formal on-site AED program.

- **Do not** connect the defibrillator pads to a patient with a pulse. The only time that a patient with a pulse may have defibrillator pads attached is when the patient has been defibrillated and presently has a pulse.
- **Do not** come into contact with the patient during defibrillation, including any equipment that may be in contact with the patient. Ensure others are clear both visually and by announcing, "**I am clear. Everyone is clear.**" immediately prior to delivering each shock.
- **Do not** allow the use of radio transmitters (transmit only) in the immediate vicinity of the defibrillator while analyzing. Radio transmitters **may** introduce artifact and prevent the shocking of patients who are in an otherwise "shockable" rhythm. (Operating Manual – Possible electrical interference indicates to maintain at **least four feet** away and do not rapidly key radios on and off).
- Be familiar with and follow all **cautions** and **warnings** or **symbols** and **messages** of the LP500 and or CR Plus operating manual. Be familiar with proper **electrode placement** following the age guidelines.

Low Battery Detection



When the battery symbol **is lit**, the battery is low but can still be used. On the LP 500 when the battery symbol **flashes** and the **replace battery** message is displayed the battery is very low and should be replaced immediately. Revert to basic life support CPR skills and document actions on your reports.

Service Indicator



When the service indicator is lit the defibrillator detects a problem that requires immediate service. On the LP 500 the service indicator will flash on the **flashes** and the **call service** message appears. Turn the defibrillator off and on if the message still appears turn unit off and revert to basic life support CPR skills and document actions on your reports.



Special Considerations:

Age Limits



Review: Children Electrodes Placement

Do not attach the defibrillator to **anyone less than eight (8) years of age** when using the adult electrodes, **unless** the defibrillator is utilizing the **paediatric electrodes**. (Which are the pink electrodes with a child/infant picture on the electrodes). In this case using the Paediatric Electrodes are for those patients **one to 8 years of age**. Do not attempt to use the AED on anyone under the age of 12 months. Infant, (under 12 months) defibrillation has not been endorsed by the HSFC or the AHA at this time. In this case perform infant CPR until the paramedics arrive.

Defibrillation for Hypothermia Patient

Hypothermia is a condition where a person's core body temperature has cooled to 35 degrees Celsius or less. This addresses severe hypothermic patients. (Example: patient is VSA and is very cold to the touch.) Verify absence of pulse for min. of 45 seconds. Remove patient from exposure to elements and avoid rough handling. Remove wet clothing and prevent further heat loss with blankets. If shock advised prompts appear, **deliver shocks to a maximum of 3 in total**. Continue with CPR and notify Fire and EMS service of your actions on their arrival.

Defibrillation in Pregnant VSA Patients

There is **no change** in defibrillation protocol for pregnant patients. Proceed as per VSA protocol from the Medical Directors Standing Orders.

Defibrillation on Metal Surfaces, in Standing Water, Ice Surfaces, in Flammable Environments

Defibrillation on metal or conductive surface should be cautioned. Ideally, victims should be treated on concrete surfaces that do not conduct electricity, but metal platforms, grading and stretchers should not pose a risk to responders. Do not defibrillate victims lying in a pool of standing water. Remove the victim if immersed in water before beginning defibrillation protocols. Even if the ground area is slightly wet or damp it should be safe to start defibrillation protocols. Defibrillation on ice surfaces can be attempted, ideally place the patient on a backboard and ensure the electrodes are in their proper placement on the chest. Defibrillation in flammable areas or in enriched oxygen rooms or areas should not be attempted. In all these cases, when in doubt move the patient to a safe area where there is no longer, any risk to either the patient or the rescuer.



Transfer to EMS Personnel (Fire or Ambulance)

Certain information is important for EMS Personnel such as the time of collapse, when was CPR started, the number of shocks. Try to provide accurate verbal details to these responders. Written reports are not necessary to turn over to EMS personnel at the time of the emergency, these can be made available to receiving hospitals through your Medical Director after the reports have been reviewed. Exchange procedures for replacement of electrodes may be in place within your medical system. Ask for a replacement set to ensure your AED unit is ready for another emergency.

Remember: " Saving Lives is Everyone's
Business "



PAD-Responder (PAD-R) -Self Evaluation

Please read each question carefully and choose the most correct answer.
You must obtain a score of 10/14 to be successful.

1. What is ventricular fibrillation?
 - a. Rapid, but organized heart rate.
 - b. Period prior to heart attack, patient describes as palpitations.
 - c. The heart quivering without rhythm.

2. How far away should the electrode be placed on a patient with an implanted pacemaker?
 - a. 2 to 4 inches
 - b. 1 to 2 inches
 - c. Placement does not matter if the patient is in cardiac arrest.

3. The defibrillator pads should be attached to:
 - a. All patients with a pulse.
 - b. Patients for potential defibrillation whether a pulse is present or not.
 - c. Patients without a pulse who are candidates for defibrillation or those patients who have been defibrillated and presently have a pulse.

4. A "wrench symbol" message on screen indicates:
 - a. The unit has a low battery or is disabled and must be removed from service immediately.
 - b. The unit is scheduled for normal routine preventative maintenance.

5. A patient has just been attached to the defibrillator and analyzed. A "No Shock Advised" message was received. The next step is:
 - a. Check pulse and reanalyze immediately.
 - b. Follow prompts, check pulse and perform CPR for one minute.
 - c. CPR for two minutes and analyze.
 - d. Transport immediately with CPR.

6. Radio equipment may interfere with the operation of the defibrillator.
 - a. True
 - b. False



7. You are performing Adult one-rescuer CPR. After completing 15 compressions, your next step is:
 - a. Give one breath
 - b. Give two breaths.

8. In CPR, before beginning chest compressions, you must ensure that the casualty:
 - a. Has no pulse.
 - b. Is not breathing.
 - c. Has an open airway.

9. CPR may be interrupted to apply defibrillator pads.
 - a. True
 - b. False

10. For hypothermic patients, the maximum number of shocks to be delivered is:
 - a. 2
 - b. 3

11. Responders should carefully (while wearing gloves) remove medication patches from the chest before attempting resuscitation, if they are in the way of electrode placement:
 - a. True
 - b. False

12. Improper pad placement and poor adhesive contact are the most common errors in prehospital defibrillation.
 - a. True
 - b. False

13. In keeping with the newest Emergency Cardiac Care Guidelines, for the use of the AED with adult electrodes will be:
 - a. Not less than 5 years of age
 - b. Not less than 8 years of age

14. The age guideline for AED use with pediatrics electrodes is one to 8 years of age.
 - a. True



b. False

MCI

Our Philosophy....

We believe that customers have a choice. We strive to think "Outside the Box" and design innovative solutions. We focus on developing programs that exceed the norm. We do this through building on the expertise and strengths of highly skilled individuals, that form an incredible team that share a common vision. We are committed to saving lives

Mission Statement....

Through expertise and a pioneering spirit we offer "outside the box" thinking to design medical program solutions that offer the customer a choice.

Medcontrol Consultants Incorporated
149 South Middle Road,
P.O. Box 126
Woodslee ON CANADA
N0R 1V0

Toll Free 1-866-244-8044
Fax (519)-975-0343

www.medcontrol.ca
info@medcontrol.ca

