

Primary Health Care Initiatives (PHCI) Project
Contract No. 278-C-00-99-00059-00
Abt. Associates Inc.

CARDIOPULMONARY RESUSCITATION

LEARNING OBJECTIVES

- Describe the definition and priorities in CPR
- Understand the management of airway obstruction
- Describe the technique of CPR in both a witnessed and unwitnessed collapse
- Be able to correctly interpret cardiac fibrillation and apply defibrillation
- Understand the modifications to CPR necessary in resuscitation of infants and children
- Use properly the basic medicines available for CPR

TEACHING STRATEGIES

- Combine didactic teaching with demonstration of CPR techniques – try to give no more than 15 minutes lecture before each demonstration
- Break participants into smaller groups to practice CPR techniques on manikins or each other

MATERIALS AND EQUIPMENT

- Overhead projector and transparencies
- Chalkboard or Whiteboard
- Demonstration manikins for CPR – adult and infant
- Alcohol solution or other disinfectant for cleaning manikins after each use

LEARNING POINTS

- Causes of anoxia and cardiac arrest
 - ◆ Foreign body, especially while eating, or in small children
 - ◆ Drowning
 - ◆ Bronchospasm or laryngospasm, as in severe allergic reaction or severe asthma
 - ◆ Trauma to chest or neck
 - ◆ Myocardial infarction
 - ◆ Pulmonary embolism
- Airway management and ventilation
 - ◆ Airway clearing – Heimlich maneuver
 - ◆ Airway positioning – jaw thrust, neck extension (except in head or neck injury)
 - ◆ Mouth to mouth – adult; mouth to face/nose in children
 - ◆ Bag/mask
- Resuscitation Protocol – unwitnessed collapse - 1 and 2 rescuers
 - ◆ Proper technique – 1 rescuer

- a. Attempt to arouse patient (shake and shout) – confirm unconsciousness
 - b. Clear and Open airway (jaw thrust, neck extension)
 - c. Confirm absence of breathing – give 2 breaths by mouth-to-mouth or mask/Ambubag
 - d. Check carotid pulse, confirm absence – begin chest compressions
 - e. Position of rescuer’s body
 - f. Position of hands on chest
 - g. Correct compression (straight down 2-3 cm.) at 60/minute
 - h. Ratio chest compression to respiration – 15:2 in adult (1 rescuer)
 - i. Check for ventricular fibrillation and defibrillate as soon as possible
- ◆ Resuscitation Protocol – 2 rescuers
 - a. Attempt to arouse patient (shake and shout) – confirm unconsciousness
 - b. Clear and Open airway (jaw thrust, neck extension)
 - c. Confirm absence of breathing – give 2 breaths by mouth-to-mouth or mask/Ambubag
 - d. Check carotid pulse, confirm absence – begin chest compressions
 - e. Position of each rescuer’s body (opposite sides of patient, 1 providing respiration, 1 providing chest compression)
 - f. Position of hands on chest
 - g. Correct compression (straight down 3-4 cm.) at 60/minute
 - h. Ratio chest compression to respiration – 5:1 in adult (2 rescuers)
 - i. Alternate positions frequently to avoid fatigue
 - j. Check for ventricular fibrillation and defibrillate as soon as possible
 - ◆ Resuscitation Protocol – witnessed collapse
 - Same as Unwitnessed protocol, but add strong blow to chest before beginning chest compressions
 - ◆ Risks to patient of cardiac massage
 - Fracture of ribs
 - Pneumothorax
 - Damage to liver or spleen with hemorrhage
 - Need for proper technique to minimize risks
 - ◆ Medications used in CPR in the health center
 - IV fluid – Ringers Lactate at 200 – 250 ml/min, also used to give medication
 - Epinephrine – for improved contractions, fine fibrillation, asystole – 1 mg. IV (10 ml. of a 1:10,000 solution)
 - Sodium Bicarbonate – only given in resuscitation efforts lasting longer than 20 minutes – 50 meq. IV
 - Calcium – asystole or electro-mechanical dissociation (ECG activity with no pulse) – 5 ml. of a 10% solution IV
 - Atropine – for bradycardia <40/min. – 1-3 mg. IV
 - Lidocaine – for ventricular fibrillation, arrhythmia - 1 mg/kg or 50-100 mg IV for adults
 - Defibrillation

- ◆ Recognition of ventricular fibrillation, ventricular tachycardia, asystole, electromechanical dissociation
- ◆ Knowledge of defibrillator machine (how to turn on, how to charge paddles, correct placement of paddles)
- ◆ Correct dosage of joules – increasing strength and protocol
 - Begin with 200 joules, then 200 again, then 360
- Pediatric resuscitation
 - ◆ Infants and children most often have only respiratory arrest, may only need mouth-to-face or mask/Ambubag ventilation for recovery
 - ◆ Initial confirmation of collapse same as for adult:
 - Shake and shout to confirm unconsciousness
 - Clear and open airway (clear foreign bodies, neck extension and jaw thrust) **Especially important in drowning, foreign body choking in children**
 - Confirm absence of spontaneous breathing – give 5 breaths
 - Check carotid pulse, confirm absence – begin chest compressions
 - Use 2 fingertips (infant) or palm of 1 hand (child)
 - Compress chest 1-2 cm.(infant) to 2-3 cm. (child)
 - Ratio of compressions to breaths – 5:1
 - ◆ Airway management – mild neck extension, jaw thrust forward
 - ◆ Foreign body – Back blows alternating with Heimlich maneuver (lower chest compression)

PREVENTION ISSUES AND HEALTH EDUCATION MESSAGES

- Consider holding basic CPR instruction classes for members of the community
- Encourage community vigilance for potential hazards such as unprotected cisterns or other bodies of water, electrical hazards, etc.
- Use every opportunity to promote reduction of risks for coronary artery disease, such as avoidance of smoking, low fat diet, regular exercise.

PATIENT OR FAMILY COUNSELING ISSUES

- When possible, inform family members of CPR activities and explain process
- Deal sympathetically with emotional responses of family members
- Understand that anger and confusion may be an initial response by some family members to a CPR situation – counsel staff members to not over-react to this

CRITICAL POINTS FOR REFERRAL

- ALL patients who are successfully resuscitated with CPR should be transferred to an appropriate hospital as soon as vital functions have been stabilized

CRITICAL ELEMENTS FOR EVALUATION OF COMPETENCE

- Correct application of A,B,C of resuscitation
- Demonstration of correct technique in managing airway obstruction

- Demonstration of correct technique of CPR – witnessed and unwitnessed, one and two rescuer
- Correct identification of ventricular fibrillation, ventricular tachycardia, asystole, and electro-mechanical dissociation
- Proper application and use of the defibrillator
- Demonstration of correct technique of CPR for infants and children

RESUSCITATION PROTOCOL - SUMMARY

| | Child | Adult – 1 Rescuer Unwitnessed Collapse | Adult – 2 rescuers Unwitnessed Collapse |
|----|---|---|---|
| 1 | Confirm unconsciousness (shake and shout) | | |
| 2 | Call for help if available | | |
| 3 | Open airway (neck extension, jaw thrust) | | |
| 4 | Confirm lack of breathing (look, listen, feel chest) | | |
| 5 | Check for and clear foreign bodies | | |
| 6 | Give 5 breaths (mouth-to-mouth or mask/AmbuBag) | Give 2 breaths (mouth-to-mouth or mask/AmbuBag) | Give 2 breaths (mouth-to-mouth or mask/AmbuBag) |
| 7 | Confirm continued absence of respirations and absence of pulse – feel carotid artery | | |
| 8 | Begin chest compressions (2-3 cm at 100/min.) with one hand. Continue respirations at rate of 5 compressions/1 respiration | Begin chest compressions (3-4 cm at 60/min.) with two hands. Continue respirations at rate of 15 compressions/2 respirations | Begin chest compressions (3-4 cm at 60/min.) with two hands. Continue respirations at rate of 5 compressions/1 respiration |
| 9 | Check for ventricular fibrillation and defibrillate as soon as possible (200 – 200 – 360 – 360 joules for adult) | | |
| 10 | Begin IV and Ringers Lactate Give epinephrine IV (0.01mg/kg for a child; 1 mg for adult) Give other medications as appropriate to situation | | |
| | Re-evaluate situation every 5 minutes | Re-evaluate situation every 5 minutes | Alternate positions frequently. Re-evaluate situation every 5 minutes |