

## **CPR**

### ***CARDIO-PULMONARY RESUSCITATION (CPR) IS THE MOST COST-EFFECTIVE HEALTHCARE PRACTICE WHICH CAN SAVE HUMAN LIVES***

J&K has been in the middle of conflict over the last few decades. Emergencies consequent to heart ailments, accidents and injuries have become a part of our day-to-day life. This demands an extensive network of A&E (Accident and Emergency) health units throughout the state which could extend help to the needy at the place of the events. Referral to the central tertiary units wastes crucial time to manage the emergencies and wastes lots of human lives. There are no directed efforts to cater to accident and emergencies at the place of occurrence. This needs a highly coordinated exercise, health planning, budgetary support and strong political will. In addition to building physical infrastructure and manpower development, we need several healthcare practices to be introduced in our system. Of several such practices, cardio-pulmonary resuscitation policy (named in short as CPR) is the basic one and of fundamental importance.

What is CPR? **Cardiopulmonary resuscitation (CPR)** is an emergency procedure which is performed in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person in cardiac arrest. In the event of an emergency, may be heart attack, drowning, serious trauma like road traffic accidents or bomb blasts etc immediate and commonest cause of death is due to cardiac arrest or respiratory obstruction or depression. Both cardiac and/or respiratory depression causes serious loss of blood supply and oxygen to brain and other vital body tissues. In view of so, brain death occurs in a matter of less than 6 minutes. Restoring cardiac or respiratory functions then (when proper medical help is available) after brain death ensues is of no use to the incumbent. Thus first few minutes following an emergency is crucial and if blood supply to brain is maintained in this crucial period, eventual restoration of cardiac or respiratory function can save a life. Thus CPR has to be instituted during that critical period between when an emergency strikes a human being till proper medical help is available to restore cardiac or respiratory function. CPR alone is unlikely to restart the heart; its main purpose is to restore partial flow of oxygenated blood to the brain and heart. The objective is to delay tissue death and to extend the brief window of opportunity for a successful resuscitation without permanent brain damage.

Who should be trained in CPR? Of course all healthcare workers from medical personal to Paramedics and other non-medical staff in healthcare units should be trained in CPR. In fact it is mandatory for all hospital employees in the West to have basic CPR certifications and maintain it on a regular yearly basis. Without this certification, healthcare workers in the West cannot practice medicine. It is extremely useful that CPR training should be extended to a section of interested personal in the community (Bystander CPR). This should include those in the factories, offices, schools, and in the general public. This way CPR can be extended to those coming up with medical emergencies in such places and at homes (out-of-hospital CPR). We must rely on a trained and willing public to initiate CPR and to call for professional help and early defibrillation. Based on these facts, many countries have recently started public training programs that include teaching CPR and first-responder automated external defibrillator (AED) use. However, despite the recent emphasis on the importance of bystander initiated CPR and the expansion of public training programs, CPR is performed in only a third or less of witnessed arrests in western societies. Why bystanders are reluctant to perform CPR is still not clear. Inadequate training methods, complicated

guidelines or fear of transmitted diseases may be responsible. Frequent, shorter and more accessible CPR courses for the public may be an appropriate solution.

What is the basic principle of CPR? CPR involves chest compressions at least 5 cm deep and at a rate of at least 100 per minute in an effort to create artificial circulation by manually pumping blood through the heart. In addition, the rescuer may provide breaths by either exhaling into the subject's mouth (mouth-to-mouth breathing) or utilizing a device that pushes air into the subject's lungs. This process of externally providing ventilation is termed artificial respiration. Current recommendations place emphasis on high-quality chest compressions over artificial respiration; a simplified CPR method involving chest compressions only is recommended for untrained rescuers. Compression only (hands-only or cardio-cerebral resuscitation) CPR is a technique that involves chest compressions without artificial respiration. It is recommended as the method of choice for the untrained rescuer or those who are not proficient as it is easier to perform and instructions are easier to give over the phone. In adults with out-of-hospital cardiac arrest, compression-only CPR by the lay public has a higher success rate than standard CPR. The exceptions are cases of drowning, drug overdose, and arrest in children. Children who receive compression only CPR have the same outcomes as those who received no CPR. The method of delivering chest compressions remains the same, as does the rate (at least 100 per minute). It is hoped that the use of compression only delivery will increase the chances of the lay public delivering CPR. For those with non cardiac arrest and people less than 20 years of age standard CPR is superior to compression only CPR. Next crucial in making CPR successful is the availability of defibrillator which supplies electrical current through the heart and restores the heart rhythm and heart contractions. Such devices are available with the mobile medical ambulances or at each floor in the hospital floor. Automated external defibrillator (AEDs) are lightweight, computerized devices containing a battery, capacitors and electronic circuitry to analyze the cardiac rhythm and inform the operator when a defibrillation shock is needed. AEDs have been described as the single greatest advance in the treatment of VF (Ventricular Fibrillation) cardiac arrest since the development of CPR. These devices have been shown to be extremely safe and highly accurate in detecting life threatening heart rhythms. The sensitivity and specificity for the detection of VF or rapid VT are 98% and 100%, respectively. The efficacy of AEDs in improving survival after out-of-hospital cardiac arrest has been shown in many studies.

CPR is indicated for any person who is unresponsive with no breathing, or who is only breathing in occasional agonal gasps, as it is most likely that they are in cardiac arrest. If a person still has a pulse, but is not breathing (respiratory arrest), artificial respirations may be more appropriate, but due to the difficulty people have in accurately assessing the presence or absence of a pulse, CPR guidelines recommend that lay persons should not be instructed to check the pulse, while giving health care professionals the option to check a pulse. In those with cardiac arrest due to trauma CPR is considered futile but still recommended.

Ischemic heart disease is the leading cause of death in the world. Sudden cardiac arrest (SCA) is responsible for more than 60% of adult deaths from coronary heart disease. Data from the Centers for Disease Control and Prevention in the USA estimates that approximately 330 000 people die annually from coronary heart disease. About 250 000 of these deaths occur in the out-of-hospital setting. The OPALS study in Canada (Ontario Prehospital Advanced Life Support Study) reported out-of-hospital cardiac arrest rates at 0.6 per 1000 population per year. Data from Scotland and

five other European cities showed that the annual incidence of resuscitation for out-of-hospital cardiopulmonary arrest of cardiac aetiology is 50–66 per 100 000 population. Ventricular Fibrillation (VF) is the predominant rhythm encountered in the first 3–5 min after sudden out-of-hospital cardiac arrest. In this rhythm, which is incompatible with life, the left ventricle develops a very rapid rhythm that prevents blood from pumping out to the body. Immediate therapy with defibrillation is the only effective treatment and resuscitation is most successful if defibrillation is performed in about the first 5 min after collapse. Immediate CPR with chest compressions and ventilation provides a small but critical amount of blood to the heart and brain while waiting for a defibrillator to arrive. CPR increases the likelihood that a shock will terminate VF. CPR is especially important if a shock is not delivered for 5 min or more after collapse. Many victims of SCA, therefore, can survive if bystanders act immediately while VF is still present, but successful resuscitation is unlikely once VF has deteriorated to asystole. Since its introduction more than four and half decades ago, the science of CPR has been enriched with a significant amount of scientific evidence. This in turn has led to the birth of new evidence based guidelines for resuscitation published by the European Resuscitation Council (ERC) and the American Heart Association (AHA) in late 2005.

Thus if we have to save lives from medical emergencies in our community especially in the middle of conflict zone we are in, we must extend a network of A&E health units to far flung regions of our society and implement a series of healthcare practices, one of which is CPR. This way we shall save numerous valuable lives with minimal costs. Building tertiary care state-of-art structures which drain state finances are too far away from the site of such events to extend such help and save such lives.

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