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EDITORIAL :

Proposed modifications to CPR guidelines:

The Cardio Pulmonary Resuscitation or CPR is an emergency medical procedure consisting of rapid chest compressions to maintain artificial blood circulation, along with artificial respiration. It is continued either till the Return of Spontaneous Circulation (ROSC) or declaration of death. The purpose of CPR is to maintain a flow blood to brain & heart, thereby postpone the tissue death & brain damage, until cardiac activity is restarted commonly by Defibrillation.

American Heart Association (AHA) Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) 1997 said "Laypersons should be encouraged to do compression-only CPR if they are unable or unwilling to provide rescue breaths (Class IIa), although the best method of CPR is compressions coordinated with ventilations". The statement contained a secondary conclusion that "...provision of chest compression without mouth-to-mouth ventilation is far better than not attempting resuscitation at all." Reasons cited prospectively for the reluctance to perform CPR included concerns about disease transmission related to performing mouth-to-mouth ventilation.

It is emphasized that chain of Survival depends on following factors.

1. Early Cardio Pulmonary resuscitation CPR, to minimize organ injury & buy time.
2. Early Defibrillation to restore circulation.
3. Early advanced life support & Post resuscitation care, to restore Quality of life by enhancing the recovery of neurological function.

The 2005 CPR guidelines were published by the International Liaison Committee on Resuscitation (ILCOR), and Emergency Cardiovascular Care (ECC) Science with a goal of simplifying CPR for lay rescuers and healthcare providers alike, and to maximize the potential for early resuscitation.

1. A universal compression-ventilation ratio (30:2), instead of 15:2 (except in Infants)
2. The removal of the emphasis on lay rescuers assessing for pulse or signs of circulation for an unresponsive adult victim,
3. Taking the absence of breathing as the key indicator for starting CPR rather than an absent pulse, in an unresponsive victim. It is observed that Lay persons can not detect pulse in 40% of cases & thus it must be performed by health care personnel only.

Following a Sudden Cardiac arrest, three distinct physiological phases in the body, especially Heart & Brain are described.

- a. Electrical phase - In the first 4-5 minutes, Defibrillation has most dramatic effect and it is highly successful.
- b. Hemodynamic phase – In the next 4-5 min due to circulatory failure, the fibrillating heart depletes all the myocardial high energy phosphate bonds and later resuscitation of normal contractile activity becomes more difficult. Hence early uninterrupted chest compressions will provide coronary & cerebral circulations and help the attempts to defibrillate the heart and restore spontaneous circulation. Since the pressures generated by chest compressions are quite low compared to intact circulation, the interruptions are to be strongly discouraged.
- c. Metabolic: CPR is only likely to be effective if commenced within 6 minutes after the blood flow stops,[1]. Later the cells are unable to survive the reintroduction of oxygen in a traditional resuscitation. Hypothermia seems to protect the victim by slowing down metabolic and physiologic processes, greatly decreasing the tissues' need for oxygen.

Compression only (cardio cerebral) resuscitation

The compression-only CPR, also known as cardio-cerebral resuscitation (CCR) is simply chest compressions without artificial respiration. The CCR method has claimed a 300% greater success rate over standard CPR with the exceptions of drowning or drug overdose. A Japanese study published in 2007, claimed strong evidence that compressing the chest, and not mouth-to-mouth (MTM) ventilation, is the key to helping someone recover from cardiac arrest.[2]. On March 30, 2008, the American Heart Association stated that compression-only CPR works as well as, and sometimes better than, traditional CPR.[3]

Advisory statement of the European Resuscitation Council on 31 March 2008 prompted the American Heart Association (AHA) to issue a statement recommending that bystanders who witness a sudden collapse in an adult should give chest compressions without ventilations.

The European Resuscitation Council after reviewing the available published scientific evidence, considered that, "the current evidence is insufficient to alter its guidelines for BLS at this moment". A new consensus on science will be published in 2010 and it is appropriate to await the outcome of this process before new changes in the guidelines are

recommended. It is not in the interest of the quality of CPR, to introduce new changes while the current Guidelines are just being implemented. The resulting confusion will be counterproductive.

The European Resuscitation Council therefore continues to recommend the teaching and administration of high quality, minimally interrupted chest compressions at a rate of 100/minute alternated with two mouth-to-mouth ventilations in a ratio of 30:2. For those rescuers who are unwilling or unable to give mouth-to-mouth ventilations, chest compression-only is much more acceptable than performing no CPR at all.

Defibrillation : The electric current of adequate magnitude passes across the myocardium from the electrode paddles placed over the apex & base of ventricles so that the fibrillating myocardium is depolarized and thus enabling the intrinsic pacemaker of the victim's heart to generate a stable perfusing rhythm. The recent studies have indicated that the Biphasic currents are more effective at cardioversion & cause minimal myocardial injury, compared to Monophasic waveform current. It is also shown that, CPR increases the success rate of Defibrillation by maintaining the coronary perfusion during the interim period after cardiac arrest. It is recommended to use a single shock of 150-200 J for biphasic current and 360 J for Monophasic current, at the earliest possible time. As there is a possible delay in establishment of palpable pulse, CPR must be continued soon after the shock, to minimize the organ damage due to ischemia.

Time Factor		
Type of Arrest	ROSC	Survival
Witnessed In-Hospital Cardiac Arrest	48%	22%
Un witnessed In-Hospital Cardiac Arrest	21%	1%
By stander Cardio cerebral Resuscitation	40%	6%
Bystander Cardiopulmonary Resuscitation	40%	4%
No Bystander CPR (Ambulance CPR)	15%	2%
Defibrillation within 3-5 minutes	74%	30%

The **post resuscitation period** is often marked by hemodynamic instability as well as laboratory abnormalities. This is also a period for which promising technological interventions such as controlled therapeutic hypothermia are being evaluated. Every organ system is at risk during this time, and patients may ultimately develop multi-organ dysfunction.

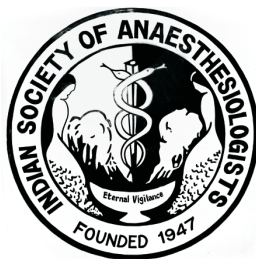
Initial objectives of post resuscitation care are to

- Optimize cardiopulmonary function and systemic perfusion especially perfusion to the brain
- Transport the victim of out-of-hospital cardiac arrest to the hospital emergency department (ED) and continue care in an appropriately equipped critical care unit
- Try to identify the precipitating causes of the arrest
- Institute measures to prevent recurrence
- Institute measures that may improve long-term, neurologically intact survival

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