

Healthy Heart



The Heart Care Clinic

Care Cardiovascular Consultants



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Message from Editor's Desk

Sudden cardiac arrest is an abrupt unexpected cessation of spontaneous and effective circulation alone or circulation and ventilation. As per WHO census statistics, the number of mortality due to cardiac causes has overtaken the number of cancer mortality. Cardiocerebral resuscitation (CCR) is a new approach to patients with an out-of-hospital cardiac arrest that has been shown to improve rates of neurologically intact survival by 25%-30% over the approach advocated by the 2000 American Heart Association guidelines. The new approach emphasises on continuous chest compressions, early defibrillation, more understanding of phases of ventricular fibrillation and post resuscitation care. And these improvements can be implemented without using a single new gadget or device. So, I would like to discuss this subject using "HealthyHeart" as the best platform.



Dr. Niren Bhavsar

Changing face of Cardiopulmonary Resuscitation - Cardiocerebral Resuscitation

Dr. Keyur Parikh: First of all tell me what does CCC-CPR or Cardiocerebral Resuscitation (CCR) means? And how is it different from standard CPR?

Dr. Niren Bhavsar: CCR consists of three major components:

1. Continuous chest compressions (CCC) without mouth-to-mouth ventilation for all bystanders of witnessed Sudden Cardiac Arrest (SCA).
2. A new ACCS algorithm that delays endotracheal intubations, emphasizes minimal interruptions of chest compressions, deemphasizes positive-pressure ventilations, prioritizes defibrillation according to the three-phase time-sensitive model of ventricular fibrillation, and encourages early administration of epinephrine.
3. The newest component of Cardiocerebral

resuscitation is advocating the establishment of cardiac arrest centers to provide urgent cardiac catheterization, controlled mild therapeutic hypothermia and standardized supportive care for patients in coma after resuscitation from cardiac arrest.



All three components of CCR explain the difference very well. In new CCR, there is minimum interruption of external cardiac compressions so as to maximize the duration of perfusion to vital organs like brain and so the name.

Dr. Keyur Parikh: What are the latest published guidelines for CPR?

Dr. Niren Bhavsar: The latest published guidelines for CPR by ACC- AHA came in 2005 and



are based on International Consensus Conference on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations.

Recent supplement for these guidelines was published in April, 2008, which now advocates continuous chest compressions for bystanders to help adults who suffer sudden cardiac arrest by providing "high-quality chest compressions by pushing hard and fast in the middle of the victim's chest, with minimal interruptions."

Dr. Keyur Parikh: Why is there a need to give attention to CCC-CPR?

Dr. Niren Bhavsar: In 2007, the Resuscitation Research Group reported that neurological normal survival was better with Chest-Compression-Only CPR even when compared to the updated guidelines calling for 30 chest compressions between 2 breaths. Because "two quick breaths", called for, in standard CPR between chest compressions took an average of 16 seconds to complete, which reduces the effective time of perfusion to vital organs.

More over, despite 40 years of cardiopulmonary resuscitation (CPR) therapies, overall survival rates after cardiac arrest remain poor.

And, of course, the most common obstacle for lay rescuer CPR is unwillingness on part of the rescuer to give mouth to mouth respiration. This hurdle is removed in CPR or cardiocerebral resuscitation.

Dr. Keyur Parikh: What are the demographics and statistics of sudden cardiac arrest (SCA)?

Dr. Niren Bhavsar: Sudden cardiac arrest is a leading cause of death in the United States killing 325,000 people each year. As I have already mentioned, as per WHO statistics, the number of mortality due to cardiac causes has overtaken the number of cancer mortalities. Approximately, 4280 out of every one lakh people die every year from SCA in India alone. SCA kills 1,000 people a day or one person every two minutes. According to a study, 8-22 % of out-of-hospital SCA patients are resuscitated and hospitalized, out of which only 1-8 % are discharged intact

neurologically, while an average of 30 % in-hospital cardiac arrest patients had Return of spontaneous circulation (ROSC) and 15 % are discharged intact neurologically.

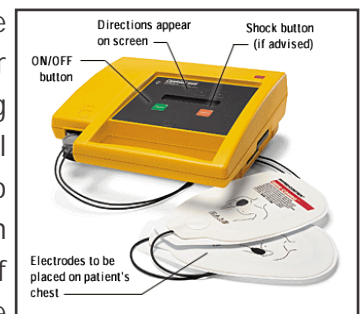
The commonest killer in SCA is coronary artery disease and the commonest rhythm is Ventricular Fibrillation (VF).

Dr. Keyur Parikh: What are the phases of VF and their importance from the management point of view?

Dr. Niren Bhavsar: Current ILCOR guidelines promulgates rhythm-based therapies during cardiac arrest which are static, meaning, they do not consider the passage of time. For example, VF is treated uniformly (with immediate defibrillation) whether the duration is 1 minute or 15 minutes. The concept of CCR or new proposed guidelines are based on triphasic model of Ventricular Fibrillation in context of time. These phases are important because the management differs from phase to phase.

THE ELECTRICAL PHASE [From SCA to 4 minutes]

Early defibrillation is ILCOR class I recommendation. A good example of early defibrillation is ICD which provides it within 15-20 sec and the conversion rate is far superior. Studies using automated external defibrillators (AEDs) to achieve rapid defibrillation (i.e., within 4 minutes of cardiac arrest) have



demonstrated improved survival in a variety of settings and situations. The effectiveness of early defibrillation is well established and can result in survival rates of upto 50%, during electrical phase.

THE CIRCULATORY PHASE [From approximately 4 to approximately 10 minutes of VF]

The most important lifesaving therapy in this phase may be to first provide oxygen delivery (chest compression/ventilation under current guidelines), followed by defibrillation (ie, delaying defibrillation by 1-3 minutes). According to a study, after 5 minutes of cardiac arrest, immediate defibrillation resulted in 30% successful



defibrillation (3/10) and 0% Return of spontaneous circulation (ROSC) (0/10), whereas 1 minute of CPR plus epinephrine before defibrillation resulted in 70% successful defibrillation (7/10) and 40% ROSC (4/10). Outcomes appear to be improved when defibrillation is briefly delayed in favor of providing some limited circulation of blood with partial restoration of substrates including oxygen, or washout of deleterious metabolic factors that have accumulated during ischemia. This change in therapy could affect a large number of cardiac arrest cases because only a minority of patients are currently attended by rescuers within 4 minutes of arrest (i.e., in the electrical phase), and far greater numbers of patients are treated during the circulatory phase.

THE METABOLIC PHASE [After approximately 10 minutes of cardiac arrest]

The effectiveness of both immediate defibrillation and CPR followed by defibrillation decreases rapidly and survival rates appear poor. During the metabolic phase (after approximately 10 minutes of arrest), tissue injury from global ischemic events and from reperfusion can result in circulating metabolic factors that cause additional injury beyond the effects of local or focal ischemia. However, the best cellular protection (decreasing cell death by 73%) occurred when cooling was performed prior to reperfusion, even if reperfusion with oxygenated media plus substrate was delayed for 10 minutes to allow time for cooling (i.e., cooling first, then reperfusion). A possible protective mechanism may involve hypothermia-mediated attenuation of the rapid oxidant burst observed with reperfusion. This challenges the current practice of immediate reperfusion for all ischemic conditions.

Dr. Keyur Parikh: What is basic life support (BLS) and advance cardiac life support (ACLS)?

Dr. Niren Bhavsar: Basic life support (BLS) includes recognition of signs of SCA, heart attack, stroke, and foreign-body airway obstruction (FBAO); cardiopulmonary resuscitation (CPR); and defibrillation with an automated external defibrillator (AED)

Advance cardiac life support (ACLS) includes

Pharmacological and Mechanical interventions to achieve ROSC by means of defibrillation, continuous chest compressions, insertion of advanced airway, i.e. access and administration of pharmacological agents.

Dr. Keyur Parikh: What is required to be done once a patient is revived from a sudden cardiac arrest?

Dr. Niren Bhavsar: The Post Resuscitation care decides the long term outcome of the patient. Initial objectives of post resuscitation care are to:

- Optimize cardiopulmonary function and systemic perfusion, especially perfusion to the brain
- Transporting victim from out-of-hospital cardiac arrest area to the Hospital emergency department (ED) and continue critical 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

The important aspects in post resuscitation care is to achieve and maintain spontaneous circulation, optimize respiratory function, temperature regulation (induction of hypothermia or control of hyperthermia), treating metabolic abnormalities, finding and treating the cause of SCA and organ specific care including CNS.

Dr. Keyur Parikh: Today, in an era of evidence based medicine, is there any evidence that suggests CCC-CPR is better than standard CPR?

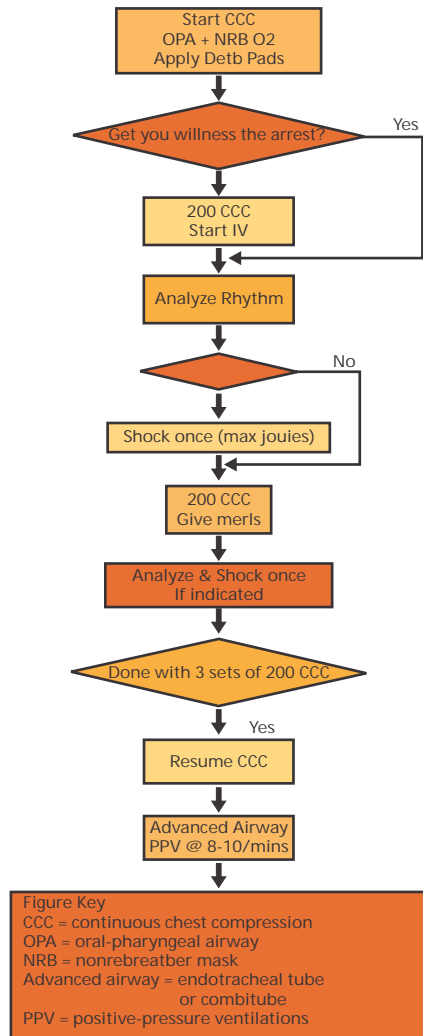
Dr. Niren Bhavsar: To date, there have been three formal publications of outcomes using cardio cerebral resuscitation. The first was from Wisconsin. Neurological normal survival of witnessed arrests with shockable rhythms tripled, from 15% to 45%. The second was from Arizona, including cities in the Phoenix metropolitan area where survival of patients tripled, from 5% -18%. The third was a three-year follow-up of the Rock and Walworth County results, in which survival increased from 15%- 40%, including one patient who received post-resuscitation hypothermia.



Dr. Keyur Parikh: What is the cardiocerebral resuscitation protocol?

Dr. Niren Bhavsar: Following is the protocol for cardiocerebral resuscitation:

The Cardiocerebral Resuscitation Protocol



Dr. Keyur Parikh: Which are the groups of people who can be trained with skills of CPR ?

Dr. Niren Bhavsar: First and foremost in our country all the doctors, paramedical staffs, hospital employees etc. must be skillfully trained to administer basic life support. Also, a few important communities like EMS teams, firemen, police, persons associated with voluntary organizations, etc. can be taught certain technical skills of CCR-CPR. In addition, these basic skills should be taught in schools, colleges, corporate offices, clubs, etc. As it is a matter of human life which can be saved with simple efforts, everybody should learn BLS or 3-C CPR or CCR so that many lives can be saved with bystander CPR.

Attention.....!!!!

Dear friends,
 For young female & male patients we have started minimally invasive cosmetic ASD/ VSD closure and Mitral Valve Repair/ Replacement through thoractom incision. MICAS CABG and Aortic Valve Replacement Surgery to follow soon. Contact our Cardiac Surgeons.

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Abstract of the month

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STATE-OF-THE-ART PAPERS
 Recent Advances in Cardiopulmonary Resuscitation
 Cardiocerebral Resuscitation
 Gordon A. Ewy, MD, FACC,* Karl B. Kern, MD, FACC†
 Tucson, Arizona

Cardiocerebral resuscitation (CCR) is a new approach for resuscitation of patients with cardiac arrest. It is composed of 3 components: 1) continuous chest compressions for bystander resuscitation; 2) a new emergency medical services (EMS) algorithm; and 3) aggressive post-resuscitation care. The first 2 components of CCR were first instituted in 2003 in Tucson, Arizona; in 2004 in the Rock and Walworth counties of Wisconsin; and in 2005 in the Phoenix, Arizona, metropolitan area. The CCR method has been shown to dramatically improve survival in the subset of patients most likely to survive: those with witnessed arrest and shockable rhythm on arrival of EMS. The CCR method advocates continuous chest compressions without mouth-to-mouth ventilations for witnessed cardiac arrest. It advocates either prompt or delayed defibrillation, based on the 3-phase time-sensitive model of ventricular fibrillation (VF) articulated by Weisfeldt and Becker. For bystanders with access to automated external defibrillators and EMS personnel who arrive during the electrical phase (i.e., the first 4 or 5 min of VF arrest), the delivery of prompt defibrillator shock is recommended. However, EMS personnel most often arrive after the electrical phase—in the circulatory phase of VF arrest. During the circulatory phase of VF arrest, the fibrillating myocardium has used up much of its energy stores, and chest compressions that perfuse the heart are mandatory prior to and immediately after a defibrillator shock. Endotracheal intubation is delayed, excessive ventilations are avoided, and early-administration epinephrine is advocated. (J Am Coll Cardiol 2009; 53:149–57) © 2009 by the American College of Cardiology Foundation



Case of the Month

Minimally Invasive Mitral Valve Replacement

A 19 year old girl presented to hospital with h/o DOE since last one year. She had a past history of rheumatic fever and rheumatic heart disease. Severe Mitral Stenosis was diagnosed on investigations.

She underwent Minimally Invasive Mitral Valve replacement through Rt. Forth intercostal space in submammary fold. This is called Bikini Scar. Choice of valve was tissue valve, considering near future marriage



and pregnancy as we did not want to give warfarin for long term, during pregnancy period. Post operative course was uneventful. She spent two days in ICU and was discharged on 5th POD.

The size of scar was just 4 cm in length. In follow up, the scar is practically invisible.

Several reports of minimally invasive valve operations have been published during the last decade. The surgical technique via a right minithoracotomy in the 3rd and 4th intercostal space and application of custom-made armamentarium gives an excellent mitral valve exposure and working field. This approach permits treatment with less invasion and better cosmetic results. Patients have less postoperative pain and a shorter hospital stay. This gives lot of confidence to the patient & also acceptability of open heart surgery becomes easier in young female patients. This minimal invasive surgery can be applied for M.V. repair, ASD closure and VSD closure also.



- Dr. Dhiren Shah, MB, MS, MCh (C.V.T.S.)
- Dr. Dhaval Naik, MS, DNB

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Fees Rs. 60/- (One Year) 12 Issues

Pulmonary Hypertension Clinic

The Heart Care Clinic is conducting Freedom-PAH trial using oral Treprostinil Diethanolamine Sustain Release Drug (Vasodilator) vs. Oral Placebo in a Randomized Trial.

Subcutaneous Treprostinil Sodium has been USFDA approved since 2002. In our past experience with 45 mg I.V as well as oral agent the symptomatic and clinical improvement obtained was satisfactory and the sponsor decided to provide medication life long to the patients.



Treprostinil sodium and Diethanolamine, the Prostacyclin analogues are the newer molecules which by their vasodilatory effect have shown to have a beneficial effect in treating Primary Pulmonary Hypertension. Many more patients of this progressive fatal disease would be benefit from its use.

The Patients will be provided following services FREE of cost:

- | | |
|-------------------------|-------------------------|
| (a) Consultation | (b) Echo |
| (c) V/Q Scan, if needed | (d) CT Angio, if needed |

All the patients will be appropriately sent back to you for further management.

For further details and queries, contact any of our team members listed on the front page or The Heart Care Clinic



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Triglyceride - A new coronary risk factor

The Heart Care Clinic is starting a "hypertriglyceridemia clinic" exclusively for patients with Fasting triglyceride Levels \geq 500 mg/dl with DM or without DM.

The patient who is on conventional treatment for hypertriglyceridemia with or without statin therapy with TG above > 750 will be provided the following services FREE of cost:

- (a) Consultation (b) Follow up (c) Lab tests

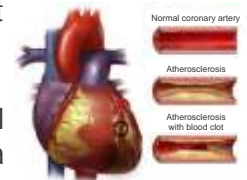
All the patients will be appropriately sent back to you for further management. Newer modalities of treatment and supportive care will be offered to the patient and family.

For further details and queries, contact any of our team members listed on the front page or The Heart Care Clinic



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Quiz of the Month

- What is the commonest ECG Rhythm in sudden cardiac arrest?
 - Ventricular Tachycardia
 - Ventricular Fibrillation
 - Asystole
 - Pure Ion Electrical activity
- What is recommended ratio of chest compression to respiration during CPR according to 2005 ACC-AHA guidelines?
 - 16:2
 - 10:2
 - 30:2
 - None
- What are the phases of VF?
 - Electrical, Mechanical, Chemical
 - Electrical, Circulatory, Metabolic
 - Metabolic, Circulatory, Electrical
 - Circulatory, Electrical, Metabolic
- In which phase of VF earliest defibrillation is effective?
 - Electrical
 - Metabolic
 - Circulatory
 - All
- Arrange the chain of survival in recommended order
 - Chest compression
 - Rescue breathing
 - AED
 - Call EMS/ activate EMS
- What is the telephone number of EMS in India?
 - 108
 - 111
 - 100
 - 420
- What are the drugs recommended for use in SCA?
 - Adrenaline
 - Beta-blockers
 - Vasopressin
 - Dobutamine
- Cardiocerebral Resuscitation concept does not include one of the following
 - Continuous Chest compression
 - Earliest DC in electrical phase
 - Early endotracheal intubation
 - Therapeutic Hypothermia

- How long the circulatory phase of VF last when the earliest DC is most effective?
 - 0-10min
 - 4-10 min
 - 0-4 min
 - >10min
- Give full name of CCR?
 - Cardio Cerebral Resuscitation
 - Cardio Cerebral Resuscitation
 - Cardio Circulatory Resuscitation
 - Continue Compression Resuscitation

Quiz and Answers of Previous Issue "Cardiac Surgery in Septo and Octogenarians: Who, When, and how?"

- (d) 30-50 %
- (a) 0.6cm/m²
- (c) 45-65 %
- (b) 4-20%
- (b) SIRS
- (a) Left internal mammary artery
- (b) Marfan Syndrome
- (c) Chronic stable angina
- (c) Clopidogrel
- (b) Bioprosthetic valve

Winners of Previous Issue



Dr. Vimal Saradava
MD (Medicine)
Morbi



Dr. Mayur Adalaja
MD
Baroda



Dr. Rakesh Ostwal
MD
Balotra (Rajasthan)



Dr. Alpesh Vora
MD
Bhavnagar



Dr. V. B. Kasundra
MBBS
Jasdan

Dr. Vijay Goplani - MBBS, Ahmedabad

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Please send your feedback and answers to the Quiz for this issue and drop it in the post box:

Name: _____
Degree _____ Name of clinic/hospital: _____
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City: _____ State: _____ Pin : _____
Contact No. (O) _____ (Mobile) _____
Email ID: _____

- Did you like this issue? Yes No
- Did you like the Topic of the issue? Yes No
- Do you think this issue updated your academic knowledge? Yes No

- Put a cross ⊗ inside the correct answer
- Only one best answer for each question
- Three correct entries on first-cum-first basis will get prizes with their name, address and photo published in next issue
- Everybody who send replies to all the 10 questions will get a Certificate of CME of One Hour (1 Hour) from 3 C CON
- Please send your answers by post to our office address.

Answer Sheet of the Quiz of Healthy Heart Volume 1 Issue-5 (April 5, 2010)

Question No.	A	B	C	D
Question-1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question-10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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