

**A PILOT STUDY ON THE KNOWLEDGE AND ATTITUDE  
TOWARD THE NEW AMERICAN HEART ASSOCIATION (AHA)  
CARDIOPULMONARY RESUSCITATION 2010 GUIDELINE ON  
“C-A-B” SEQUENCE AND THE CORRELATION WITH THE  
WILLINGNESS TO PERFORM BYSTANDER CPR AMONG  
HEALTH PERSONNEL IN EMERGENCY DEPARTMENT,  
HOSPITAL UNIVERSITI SAINS MALAYSIA (HUSM)**

**DR. NORWANI DERAMAN @ ISMAIL**

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## **LIST OF ABBREVIATIONS**

ACC/AHA	American College of Cardiology/ American Heart Association
ANZCOR	Australian and New Zealand committee on Resuscitation
AED	Automated External Defibrillator
BLS/ ALS	Basic Life Support/Advanced Life Support
CoSTR	Consensus on Science and Treatment Recommendations
CPR	Cardio-Pulmonary Resuscitation
ECC	Emergency Cardiac Care
ED	Emergency Department
EDHUSM	Emergency Department Hospital Universiti Sains Malaysia
EMS	Emergency Medical Service
ERC	European Resuscitation Council
HSFC	Heart and Stroke Foundation of Canada

IAHF	Inter-American Heart Foundation
ILCOR	International Liaison Committee on Resuscitation
OHCA	Out of hospital cardiac arrest
RCA	Resuscitation Councils of Asia
RCSA	Resuscitation Councils of Southern Africa
ROSC	Return of spontaneous circulation
SCA	Sudden cardiac arrest
VF	Ventricular Fibrillation
VT	Ventricular Tachycardia

## **ABSTRAK**

### **KAJIAN PILOT MENGENAI PENGETAHUAN DAN SIKAP TERHADAP TURUTAN CPR BARU IAITU “C-A-B” YANG DIKELUARKAN OLEH AMERICAN HEART ASSOCIATION (AHA), 2010 DAN HUBUNGKAIT DENGAN KESEDIAAN MELAKUKAN “BYSTANDER CPR” DI KALANGAN PEGAWAI KESIHATAN DI JABATAN KECEMASAN , HOSPITAL UNIVERSITI SAINS MALAYSIA (HUSM)**

**Pengenalan:** Resusitasi kardiopulmonari (CPR) yang dilakukan secara sistematik dan mengikut koordinasi yang betul sangat penting dalam perawatan kes serangan jantung mengejut. Penglibatan bystander CPR bagi melakukan rawatan awal resusitasi sementara menunggu ketibaan paramedik bagi kes- kes serangan jantung mengejut di luar kawasan hospital di Malaysia tidaklah membanggakan. Banyak faktor yang membataskan perawatan resusitasi awal ini termasuklah ketidaksediaan melakukan pernafasan mulut ke mulut. Oleh sebab itu, kajian ini dijalankan untuk mengkaji implikasi turutan CPR baru iaitu CAB terhadap kesediaan melakukan bystander CPR di kalangan pegawai kesihatan di Jabatan Kecemasan HUSM.

**Objektif:** 1) Untuk membandingkan tahap pengetahuan dan sikap di kalangan pegawai kesihatan di Jabatan Kecemasan HUSM. 2) Untuk mengenalpasti hubungkait antara turutan CPR dengan kesediaan melakukan bystander CPR. 3) Untuk mengkaji faktor-faktor yang menggalakkan bystander CPR.

**Kaedah:** Ini adalah satu kajian keratan rentas yang menggunakan soal selidik yang telah diubahsuai. Borang kajian telah diedarkan di kalangan pegawai kesihatan di Jabatan Kecemasan HUSM yang memenuhi syarat kajian. Kajian ini telah dijalankan bermula November 2013 sehingga Mac 2014.

**Keputusan:** Daripada 96 peserta yang dikaji, kesemua mereka telah melengkapkan borang kajian dengan sempurna. Terdapat ketidakseimbangan pengetahuan dan sikap di kalangan pegawai kesihatan yang dikaji. Pegawai perubatan memiliki tahap pengetahuan yang agak baik berbanding dengan pegawai kesihatan yang lain dan ini secara tidak langsung mempamerkan tahap keyakinan mereka jika terpaksa mengendalikan kes serangan jantung mengejut. Walaupun majoriti peserta bersetuju bahawa pernafasan mulut ke mulut tidak disukai dan turutan CAB adalah lebih praktikal, namun ia tidak menunjukkan sebarang kaitan antara pemilihan turutan CPR dan kesediaan melakukan bystander CPR. Secara statistik pula, keputusan ini adalah tidak signifikan ( $p=0.554$ ). Walau bagaimanapun, keputusan ini tidak mewakili populasi sebenar penduduk kawasan yang dikaji kerana peserta dalam kajian pilot ini melibatkan pegawai kesihatan yang berpengalaman dalam mengendalikan kes serangan jantung mengejut dan mengetahui akan pentingnya bystander CPR. Oleh sebab itu mana-mana pemilihan turutan CPR tidak menjejaskan kesediaan mereka melakukan bystander CPR kepada pesakit serangan jantung mengejut. Dalam kajiselidik ini hanya 1 faktor dikenalpasti yang mempengaruhi kesediaan melakukan bystander CPR iaitu pengalaman bekerja yang menunjukkan kesediaan melakukan bystander CPR berkurangan dengan peningkatan dalam jangka masa perkhidmatan.

**Kesimpulan:** Orang ramai sedar akan kepentingan bystander CPR dalam kes-kes serangan jantung mengejut. Kebanyakan peserta memilih turutan CAB yang lebih praktikal untuk dilakukan ,terutama sekali apabila berada di luar kawasan hospital. Namun, pemilihan turutan CPR dengan kesediaan peserta melakukan bystander CPR tidak menunjukkan sebarang hubungan kait.

## **ABSTRACT**

**A PILOT STUDY ON THE KNOWLEDGE AND ATTITUDE TOWARD THE NEW AMERICAN HEART ASSOCIATION (AHA) CARDIOPULMONARY RESUSCITATION 2010 GUIDELINE ON “C-A-B” SEQUENCE AND THE CORRELATION WITH THE WILLINGNESS TO PERFORM BYSTANDER CPR AMONG HEALTH PERSONNEL IN EMERGENCY DEPARTMENT, HOSPITAL UNIVERSITI SAINS MALAYSIA (HUSM)**

**Introduction:** Cardiopulmonary resuscitation, carried out in an integrated and coordinated series of actions known as chain of survival is an important element in cardiac arrest case. The presence of bystander CPR to initiate basic life support before arrival of EMS in out of hospital cardiac arrest is not promising in our local setting, even in Malaysia. Deterrence in doing resuscitation process might be due to various reasons, including mouth to mouth ventilation. Thus, this study focuses on the impact of the latest CAB sequence with the willingness to do bystander CPR.



**Objectives:** 1) To compare the knowledge and attitude between health personnel in EDHUSM. 2) To determine the association between the CPR sequence and the willingness to do bystander CPR. 3) To determine the associated factors contribute to the willingness of bystander CPR

**Methods:** This is a cross-sectional study using the modified questionnaire survey form to achieve all the objectives. The questionnaire form was distributed among the health personnel in EDHUSM. All health personnel in EDHUSM who fulfilled the inclusion criteria had been enrolled in this study. This survey was done from November 2013 to March 2014.

**Results:** Out of 96 participants surveyed, all of them completed the questionnaire form making the response rate of 100 %. There were imbalances between the knowledge and attitude between the groups of health personnel. Comparing between the groups, medical officer had more knowledge on basic life support and it reflected on the confidence level upon encounter cardiac arrest case. Although majority of participants agreed that rescue breathing were the deterrence step and acronym CAB was more practical for the bystander CPR outside hospital, but study has shown that no significant difference between preferred CPR sequence and the willingness to do bystander CPR with the fisher exact test (p value of 0.554). It might not be reflected true outside population because the participants were those who had already involve in resuscitation process daily. They know the importance of bystander CPR, either CAB or ABC sequence will not alter the decision to be bystander CPR. The only significant

factor determine the willingness to do bystander was year of service (p value of 0.049)

**Conclusion:** People are aware of the importance of bystander CPR during cardiac arrest. Majority of participants preferred the CAB sequence but their willingness to do bystander CPR is not related with the chosen CPR sequence.

## CHAPTER 1

### INTRODUCTION

#### 1.1 Overview of the study

Cardiopulmonary resuscitation (CPR) is a life-saving technique which is used after cardiopulmonary arrest (Gebremedhn *et al.*, 2014). It is a basic emergency procedure for life support, consisting of artificial ventilation and manual external cardiac massage which is performed to preserve intact brain function until arrival of EMS or measures to restore spontaneous circulation and breathing in cardiac arrest case ( such as defibrillation). CPR can be performed by trained lay people or healthcare professionals on infants, children, adolescents, and adults who are unconscious with no or abnormal breathing pattern, such as agonal respiration. Respiratory and cardiac arrest can be caused by many reasons such as allergic reactions, an ineffective heartbeat, asphyxiation, breathing passages that are blocked, choking , drowning, drug reactions or overdoses, electric shock or trauma. It can be performed either in or out of hospital setting.

Cardiopulmonary resuscitation (CPR) was first developed in a 1960 by The American Heart Association with closed- chest cardiac resuscitation technique and became the forerunner of CPR training for the general public. Historically an artificial respiration began in the 16th century with Vesallus's work on living animal, and then mouth-to-mouth and positive pressure ventilation methods in the 18th and 19th centuries (DeBard *et al*, 1980). Then only cardiac massage was begun in 1874, with the open chest method until the demonstration of the

superiority of closed chest cardiac massage in 1960. Electrical defibrillation discovered later in 1775, but was not proven successful in animals until it was applied to man internally in 1947 and externally in 1956.

The American Heart Association formally endorsed first official CPR guidelines in year 1966. Since then the guidelines for CPR and emergency cardiac care (ECC) have evolved periodically through five national conferences, held in 1966, 1973, 1979, 1985, and lastly in 1992 (Paraskos *et al*, 1993). The purpose of these conferences was to review and update published materials for guidelines on adult basic and advanced life support, as well as on paediatric and neonatal life support. These guidelines had been used by many institution and organization as a reference and practicing tools.

Later on, International Liaison Committee on Resuscitation (ILCOR) was founded on November 1992 to provide an opportunity for the major organizations in resuscitation to work together on cardiopulmonary resuscitation (CPR) and emergency cardiovascular care (ECC) protocol (ILCOR on resuscitation website). ILCOR consist of American Heart Association (AHA), European Resuscitation Council (ERC), Heart and Stroke Foundation of Canada (HSFC), Australian and New Zealand committee on Resuscitation (ANZCOR), Resuscitation Councils of Southern Africa (RCSA), Resuscitation Councils of Asia (RCA) and the Inter-American Heart Foundation (IAHF). The first international conference on guidelines on CPR and ECC was held in 1999 and the first international guidelines for Cardiopulmonary Resuscitation and Emergency Cardiac Care were published in year 2000. The researchers from the ILCOR

member councils evaluated resuscitation sciences in 5 year cycles. The 2005 AHA guidelines for CPR & ECC were produced during 2005 International Consensus on ECC and CPR with Treatment Recommendations (CoSTR) Conference (AHA website, history of CPR). These guidelines revealed a new compression: ventilation ratio as well as changes to AED usage. The most recent iteration was developed in November 2010, in which the greater emphasis has been placed on quality of CPR, with minimum interruptions, the reordering of CPR priorities to place chest compressions before ventilations, and the need for comprehensive post arrest care that includes both targeted temperature and hemodynamic management.

Our newly formed Malaysian National Committee on Resuscitation Training has recently produced the training manual of Advanced Life Support (NCORT 2012) purported to streamline a single algorithmic approach. This guideline very much reflects the “A-B-C”, rather than “C-A-B” sequence. The acronym “B” in this manual denotes “assessing for breathing” as in the ERC guideline (NCORT 2012). Unfortunately, due to the lack of a national resuscitation council in Malaysia prior to 2012, different agencies and organizations in Malaysia have conducted basic and advanced life support training courses to healthcare professionals as well as to public members based on varied syllabi and contents although almost all of them have been trained according to the “A-B-C” sequence although the “B” acronym may mean different things depending on where they have been trained. How much does this new approach have impact on those previously CPR trained personnel according to the “A-B-C” sequence is largely unknown. Not only that, how these sequences

influence the health personnel in performing bystander CPR is also uncertain. It is with these questions in mind that we embark on this survey.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Adult Basic life support**

CPR is part of the emergency cardiac care system which designed to save lives. When performed by a layperson, CPR is designed to support and maintain breathing and circulation until emergency medical personnel arrive and take over. When performed by healthcare personnel, it is used in conjunction with other basic and advanced life support measures. The universal adult basic life support (BLS) algorithm is a conceptual framework for all rescuers. It emphasizes the important components that any rescuer should perform during cardiac resuscitation including immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation, and rapid defibrillation with an automated external defibrillator (Berg *et al.*, 2010)

The steps of BLS consist of series of assessments and actions in a logical and concise manner that is easy for all types of rescuers to learn and perform. These action traditionally been proposed for single rescuer to prioritize actions. However, many workplaces and most emergency medical system (EMS) and in hospital resuscitations involve teams of health provider who can perform several action simultaneously (eg, one rescuer activates the

emergency response system, another performing chest compression, third rescuer provides ventilations and the forth sets up the defibrillator)

1. Immediate recognition and activation of the emergency response system

If a lone rescuer finds an unresponsive adult or witnessed a collapsed case, he or she should check for a response by tapping the victim's shoulder or shouting at the victim after ensuring that the scene is safe. The rescuer should look for breathing pattern, either victim is breathing or not or having abnormal breathing (eg, gasping). The trained or untrained bystander should activate the emergency response system once the rescuer finds that the victim is unresponsive. The dispatcher should be able to instruct the lay rescuer to check for breathing and performing the steps of CPR if needed.

2. Pulse check

Studies have shown that both lay rescuers and health care providers have difficulty detecting a pulse (Bahr *et al.*, 1997; Sarti *et al.*, 2001). Healthcare provider also may take too long to check for a pulse (Bahr *et al.*, 1997). It was stated in the guideline that lay rescuer should not check for a pulse and just assume that cardiac arrest is present. But for the healthcare providers, they should not take more than 10 seconds to check a pulse.



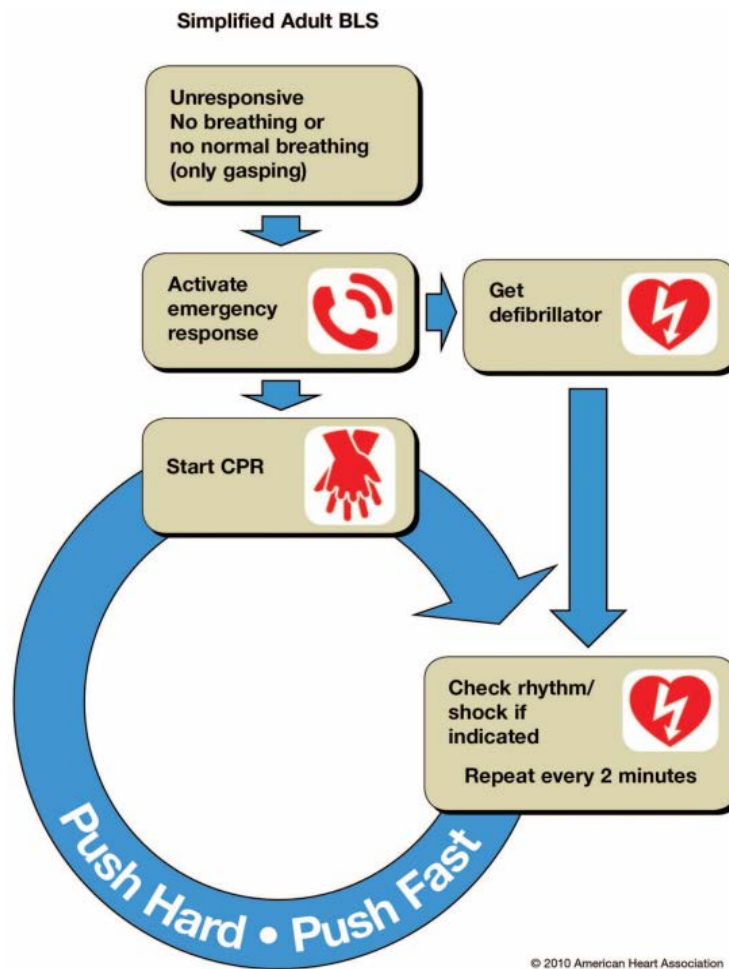
### 3. Early CPR

Effective chest compressions are essential for providing blood flow during CPR in all patients in cardiac arrest (Ochoa FJ *et al.*, 1998). Rescuers should attempt to minimize frequency and duration of interruptions in compressions. A recommended compression- ventilation ratio is 30:2. 2010 AHA guideline for CPR and ECC also recommend starting of chest compression before ventilation because it is clear that blood flow depends on chest compression. Once chest compression have been started, a trained rescuer should deliver rescue breaths to provide oxygenation and ventilation as per protocol; deliver each rescue breath over 1 second with sufficient tidal volume to produce visible chest rise (Baskett *et al.*,1993) until AED arrives.

### 4. Early defibrillation with an AED

After activating the emergency response system the lone rescuer should retrieve an AED if nearby and easily accessible and then return to the victim immediately. If 2 or more rescuers are present, one rescuer should continue with chest compression while the other activates the emergency response systems and get the AED. AED should be used as rapidly as possible without any delay. Study has shown that incorporating defibrillation as part of basic life support can reduce both mortality and morbidity from

cardiac arrest, even in cities with established, rapidly responding emergency care systems (Weaver *et al.*, 1984)



**Figure 3.** Simplified Adult BLS Algorithm.

**Figure 1**

American Heart Association simplified basic life support algorithm.

## 2.2 Cardiopulmonary resuscitation algorithm

Although there were some changes regarding the CPR sequence, the basic fundamental component in CPR is still the same, which is assessing the airway and breathing pattern, performing quality chest compression and the usage of defibrillator.

### 1. Airway and ventilation

Opening the airway (head tilt- chin lift or jaw thrust) followed by rescue breaths can improve oxygenation and ventilation. However, this manoeuvre can be technically difficult for a lone rescuer especially one has not been trained or has no basic knowledge in doing CPR. Thus, practically the untrained rescuer will benefit more on Hands-only /compression only CPR as recommended by AHA (AHA, hands-only CPR), bystanders who witness the sudden collapse of an adult should call for help and provide high quality chest compressions by pushing hard and fast in the middle of the victim's chest (2010 AHA guidelines for CPR and ECC comparison chart of key changes). Ventilations should be provided if the victim has a possibility having an asphyxia cause of the arrest (Berg *et al.*, 2000). Once an advanced airway is available, uninterrupted cycle of ventilation to chest compression can be delivered to obtain optimum result of doing resuscitation.

## 2. Chest compression

Chest compression consists of forceful rhythmic pressure over the lower half of sternum. An effective chest compression is a fundamental aspect of cardiac arrest resuscitation. Cardiopulmonary resuscitation (CPR) effectively restores hemodynamic stability, return of spontaneous circulation (ROSC) in 40% to 60% of arrests by providing heart and brain circulation. Rescuers should perform chest compressions for all victims in cardiac arrest without any delay regardless of rescuer skill level. Both human and animal studies had shown that even short 4-5 second interruptions in chest compression decrease coronary perfusion pressure (Berg *et al.*, 2001). Rescuer should focus on delivering high quality CPR, in which rescuer should provide chest compression of adequate rate (at least 100/ minute) because highest blood flows reported with chest compression 100/min (Maier *et al.*, 1986) and adequate depth (at least 2 inches/5 cm in adult, at least 1/3 antero-posterior diameter of the chest 1.5 inches/4 cm in infant and 2 inches/5 cm in children) (2010 AHA guidelines for CPR and ECC comparison chart of key changes). Effective chest compression does not only depend on compression per se but allowing complete chest recoil after each compression is equally important. Rescuers also need to minimise interruptions while giving compression. If multiple rescuers are available, task should be divided and rescuer can rotate the task of compressions every 2 minutes.

### 3. Defibrillation

The victim's chance of survival decreases with an increasing interval between the arrest and defibrillation. Although early defibrillation remains the cornerstone therapy for ventricular fibrillation and pulseless ventricular tachycardia, sufficient CPR before the first defibrillation is considered to improve the neurologic outcome in comparison to the performance of immediate defibrillation (Hayakawa *et al.*, 2009). Wik *et al* (2003) also support previous experimental and clinical work suggesting that CPR prior to defibrillation may be of benefit when there has been several minutes' delay before defibrillation can be delivered to patients with out-of-hospital ventricular fibrillation.

The other determinants of greater survival after sudden cardiac arrest is associated with provision of bystander CPR, early defibrillation, or ALS (Nichol *et al.*, 1999)

#### 2.3 Sudden cardiac arrest (SCA) and cardiopulmonary resuscitation (CPR)

Cardiopulmonary resuscitation (CPR) is a series of live saving actions that improve the chance of survival following cardiac arrest (Sasson *et al.*, 2010). Cardiac arrest defines as sudden cessation of the pumping function of the heart

with disappearance of arterial blood pressure, connoting either ventricular fibrillation or ventricular standstill (Dorland's medical dictionary for health consumer, 2007). SCA is not similar with heart attack. Heart attack is caused by blocked vessel leading to loss of blood supply to a portion of the heart. Meanwhile, SCA is primarily caused by the rapid and/or chaotic electrical activity of the heart known as ventricular tachycardia (VT) or ventricular fibrillation (VF). Secondly, it can be caused by heart attack, in which damage of the heart muscle from an interruption in oxygen flow leaves scarring on the heart and interrupt the electrical activity of the heart. The incidence and outcomes of cardiac arrest have not changed over number of decades. However, there are some areas where consistent improvement has been observed (Monsieurs *et al.*, 2012, and these include early detection, improved delivery of good CPR, and improved post-resuscitation care.

Approximately 75% of deaths from cardiac arrests occur in the pre-hospital setting worldwide. Cardiac arrests in the community occur at approximately 50–150/100 000 person years (Finn *et al.*, 2001). In the United States, sudden cardiac death accounts for approximately 200,000 to 500,000 deaths per year, with the primary inciting event, cardiac causes of sudden cardiac death contribute about 75 %). It is estimated that half of death from cardiovascular disease are sudden and unexpected, often witnessed (Bobrow *et al.*, 2008) and occur soon after the onset of symptoms. Even though individuals with established cardiac disease have a greater than 50% incidence of sudden death, cardiac arrest incidents that occur in this population are minimal.

Cardiac arrest occurs both in and out of the hospital. In the US and Canada, approximately 350000 people/year suffer a cardiac arrest (half of the cases occurred in the hospital) and received attempted resuscitation (Nichol *et al.*, 2008). The estimated incidence of EMS treated out of hospital cardiac arrest in US and Canada is about 50-55/100 000 persons/ year and 25% of these present with pulseless ventricular arrhythmias (Nichol *et al.*, 2008). Meanwhile, the estimated incidence of in- hospital cardiac arrest is 3- 6/1000 admission (Hodgetts *et al.*, 2002) and similarly 25% of these present with pulseless ventricular arrhythmias ( Nadkarni *et al.* , 2006a ).

Cardiopulmonary resuscitation (CPR), carried out in an integrated and coordinated series of actions known as the chain of survival, can improve the chance of survival in up to 50% of the cases of witnessed out-of-hospital ventricular fibrillation arrest (Rea *et al.*, 2006). The likelihood of survival to hospital discharge in this group of cardiac arrest witness has been shown to correspond to a decrease in the interval from shock to initiation of chest compressions (Rea *et al.*, 2006). Despite that, the survival rates in many out-of-hospital and in-hospital settings remain dismal and varied widely (Nichol *et al.*, 2008; Chan *et al.*, 2009). In a recent meta-analysis, it was found that the overall survival rate from out-of-hospital cardiac arrest remains almost the same for the last 30 years at around 8% (Sasson *et al.*, 2010). However, because most out hospital cardiac arrest (OHCA) events are witnessed, efforts to improve survival should focus on prompt delivery of effective interventions by the eye-witnesses (Sasson *et al.*, 2010). Unfortunately, basic life-support care often has to be provided by lay rescuers who may be involved in resuscitation only once in their lifetime (Berg *et al.*, 2010).

In a small study done in the emergency department (ED) of Hospital Universiti Sains Malaysia (HUSM), although patients with shockable cardiac arrest rhythm had a significantly higher chance to achieve return of spontaneous circulation (ROSC) as compared to patients with non-shockable rhythm, the overall rate of survival until ward admission remain the same (Chew *et al.*, 2008b). In fact, it has been found that although initiating CPR can improve the likelihood of survival, CPR is often not started until the arrival of healthcare providers (Sasson *et al.*, 2010).

## 2.4 New CPR sequence and bystander CPR

Bystander CPR is defined as CPR by untrained laymen in out of hospital cardiac arrest patients before arrival of ambulance, firefighters or police. Sudden cardiac arrest (SCA) is a crucially time dependent event. In order to improve survival and minimise neurological sequelae, it is essential to promote bystander CPR. Various endeavours have been made to increase the number of people trained in CPR (Lynch *et al.*, 2005). However, the proportion of CPR- trained persons in the community remains insufficient (Donohoe *et al.*, 2006)

As seen with many countries, the rate of bystander CPR in Malaysia is still very low (Chew *et al.*, 2008a). Furthermore, in another previous study in Malaysia, it was found that performing mouth-to-mouth breathing is a deterrence,



even among medical students (Chew *et al.*, 2008c), that results in hesitancy in performing CPR (Chew *et al.*, 2009).

Hence, in 2010, the American Heart Association (AHA) has revamped its guideline to begin resuscitation with chest compression rather than ventilations (Berg *et al.*, 2010) as this has been shown to lead to a shorter delay to initiation of compression (Heidenreich *et al.*, 2004). This sequence is known by its acronym “C-A-B” approach. This signifies a major leap from the previous sequence of “A-B-C” which has been in place for more than 40 years since the days of Peter Safar and Kouwenhoven who published the early scientific articles on modern chest compression (Safar *et al.*, 1960; Kouwenhoven *et al.*, 1960). The reason for the change of sequence is because majority of victims require CPR are adults in VF in whom chest compression is more important than ventilation (Rea *et al.*, 2006). Studies had shown that there is a delay in ventilations about 18 second in lone rescuer and even in 2 rescuers.

Although both AHA and European Resuscitation Council (ERC) based their new guidelines on the Consensus on Science and Treatment Recommendations (CoSTR) by the International Liaison Committee on Resuscitation (ILCOR), AHA and ERC interprets CoSTR differently and come out with slightly different and modified guidelines. Although AHA has changed its CPR sequence to “C-A-B”; ERC has not (Koster *et al.*, 2010). The ERC guideline still persists on with the “A-B-C” approach to CPR. Nonetheless, both AHA and ERC, in accordance to the evidences given by ILCOR, emphasize on

the importance of chest compressions. In both guidelines, 30 chest compressions are started before 2 rescue breaths (Berg *et al.*, 2010; Koster *et al.*, 2010). In other words, the acronym “B” of the “A-B-C” approach in ERC guideline denotes assessing for breathing (Nolan *et al.*, 2010) and not assessing for breathing and providing rescue breath as in the AHA guideline (Berg *et al.*, 2010).

Nevertheless, in a review by Egger *et al* (2011) comparing both sets of guidelines, the authors opine that it will not make a difference whichever resuscitation strategy is being employed as both sets of guidelines are based on the same raw material from the CoSTR by ILCOR (Egger *et al*, 2011). The real challenge as the authors have rightly acceded is translating these guidelines into pragmatic reality of encouraging bystander CPR (Egger *et al.*, 2011). This is especially as 60 – 75% of all out-of-hospital cardiac arrest cases (Litwin *et al.*, 1987) occur at home and will most probably not be attended by professionally trained rescuers. The success of CPR, as asserted by Egger *et al* (2011) lies in the hands of motivated instructors in transferring resuscitation skills and knowledge to the participants.

## **CHAPTER 3**

### **3.0 HYPOTHESIS AND OBJECTIVES**

#### **3.1 Hypothesis**

1. There will be difference in the level of knowledge and attitude among various groups of health personnel on new AHA CPR 2010 guideline on “C-A-B” sequence.
2. There will be an association between new “C-A-B” sequence with their willingness to perform bystander CPR
3. There are associated factors contributing to the willingness do to bystander CPR

#### **3.2 Research Questions**

1. What is the level of knowledge and attitude of the various groups of health personnel in EDHUSM toward new AHA CPR sequence?
2. What is the association between CPR sequences with the willingness to perform bystander CPR?
3. What are the factors contribute to the willingness to do bystander CPR?

### **3.3 General Objective**

To determine the knowledge and attitude of health personnel in EDHUSM toward the new American Heart Association (AHA) CPR 2010 guideline on “C-A-B” sequence.

### **3.4 Specific Objectives**

1. To validate the questionnaire form ( Malay version ) via face and content validation
2. To compare the knowledge and attitude between various groups of health personnel in EDHUSM on new AHA CPR 2010 guideline on CPR sequence.
3. To determine the association between CPR sequence with the willingness to perform bystander CPR
4. To determine the factors contribute to the willingness to do bystander CPR

### **3.5 Operational definitions**

1. Health personnel – men and women working in provision of health services, whether as an individual practitioners or employees of institutions and programs, whether or not professionally trained, and whether or not subject to public regulation.(Nelson, 1977)
2. Cardiopulmonary resuscitation (CPR) – an emergency procedure consisting external cardiac massage and artificial respiration; the first treatment for a person who has collapsed and has no pulse and has stopped breathing; attempts to restore circulation of the blood and prevent death or brain damage due to lack of oxygen.( wordnet, 2003-2012)
3. Hands-Only CPR -CPR in use of manual chest compressions only without artificial respiration. (Lee, 2012)
4. Bystander – one present but not taking part in a situation or event : a chance spectator ( Dictionary, 2006)

## **CHAPTER 4**

### **METHODOLOGY**

#### **4.1 Study design**

This is a cross-sectional study to achieve all specific objectives, anonymized, questionnaire survey study.

#### **4.2 Study Approval**

Approval from the Human Research Ethics Committee Universiti Sains Malaysia was obtained for this study in July 2013. This study has also been reviewed by the EDHUSM Review Board.

#### **4.3 Study Duration**

This study was carried out from November 2013 to February 2014.

#### **4.4 Study location**

This study was conducted at the Emergency Department, Hospital Universiti Sains Malaysia (HUSM), Kubang Kerian, Kelantan. HUSM is a regional tertiary centre, and also a teaching hospital for the undergraduates as well as the postgraduates study.

#### **4.5 Study sample**

##### **4.5.1 Reference population**

Health personnel in Emergency Department HUSM

##### **4.5.2 Source population**

Health personnel in Emergency Department HUSM who fulfilled the inclusion criteria.

#### **4.5.3 Inclusion criteria**

Health personnel in Emergency Department HUSM who have been trained and/or taught basic life support in accordance to the basic life support syllabus prior to 2010.

- Formally trained (healthcare proof basic life support and/or advanced life support workshops prior to 2010)
- Informally trained ( health personnel who have been taught/trained in basic life support according to “A-B-C” sequence prior to 2010 in their curriculum )

#### **4.6.4 Exclusion criteria**

- Those who have not attended any training or taught in any basic and/or advanced life support courses before *or*
- Those who have never been trained/taught in the “A-B-C” sequence of CPR before, (regardless of whether they were taught or trained in the new “C-A-B” sequence of CPR).
- Anybody who refuses to involve in this study



**Reason for this exclusion:**

Those who have never been trained or taught in the “A-B-C” sequence before would probably not be able to make a meaningful comparison between the “A-B-C” and the “C-A-B” sequence. A brief explanation of the differences between these two is not justified to make a meaningful comparison.

Relevant explanation would be given to the participants before they enrolled in this survey.

Note:

To improve anonymity of survey, all filled survey forms should be enclosed in an opaque envelop before returning to the researchers

**4.6 Sampling method and sample size**

**4.6.1 Sampling method**

Questionnaire based survey.

**4.6.2 Sample size:**

All health personnel in Emergency Department HUSM who fulfill the inclusion and exclusion criteria will be included. Convenient sampling applied.

## **4.7 Research tools**

A questionnaire will be used in this study. The questionnaire will be divided into 4 domains. The first domain will be questionnaire on socio-demographic, the second domain will be questionnaire pertaining to BLS/CPR training, the third will be questionnaire on knowledge and the forth will be questionnaire on attitude. The questionnaire form is attached as Appendix A

### **4.7.1 Questionnaire Development**

There is no suitable validated set of questionnaire regarding the knowledge and attitude on CPR sequence been identified after extensive online search. Thus the principal investigator has decided to developed own set of questionnaire. The questionnaire of this study was developed based on extensive review of articles, journal, standard textbook and policy statement by recognized emergency medicine board. The edited set of questionnaire handed to a panel of expert for content validation. Since this is a pilot study, no pretest questionnaire has been done. After the content validation process settled, the initial set of questionnaire will be distributed to the emergency health personnel in Hospital Universiti Sains Malaysia for the purpose of the study, to fulfill the objectives. Both the face and content validation do not involve any statistical analysis.