

## Cardiovascular And Cardiopulmonary in Nursing Practice: A Review

Y.Surahaya Mohd Yusof

Faculty of Nursing  
Widad University College

Email: [surahaya@widad.edu.my](mailto:surahaya@widad.edu.my)

### Abstract

Basic life support is a part of nursing skill that needs to be improved and investigated further in advance technologies. According to research, 96 percent of trainees who have attended nanostructured BLS lessons had a very low ability to recognize arrest. Malaysia in 2020 discovered improved comprehension after assessment with structured CPR and BLS instruction. CPR and BLS procedures are useful for any healthcare provider to know in order to cope with life-threatening circumstances.

**Keywords:** *Cardio Pulmonary Resuscitation, Basic Life Support, Cardiovascular Nursing,*

### 1. INTRODUCTION

Cardiovascular diseases (CVDs) are a global healthcare issue; according to WHO, 17.9 million people died from CVDs in 2020. (CVDs). The American Heart Association (AHA) spends USD316 billion on cardiovascular disorders and strokes, which is a large amount of money and many hours of productivity lost. However, there are a scarcity of trained individuals to deal with these disorders. Subsequently, Chandran and Abraham (2020) discovered that 96 percent of students had attended nanostructured basic life support (BLS) lessons, their ability to recognize the diseases were very low. Malaysia designed structure training in the year 2020 to better grasp post-assessment of this disorders. This was backed by an international competency course (ICC) program, which advocated short courses in basic life support (BLS) competency ranging from novice to advance. According to Creswell (2013), the competency training demands a specified level of success to be met in order to be recognized by the institution or organization and meet hospital expectations.

Junior healthcare staff must be able to do cardiopulmonary resuscitation (CPR). Thus, it appears that life support skills are a rigorous course for health care providers to take before entering the job. Based on the facts stated above, the researcher is interested in researching the significance of skill proficiency in CPR. Hence, all healthcare personnel, including nurses, must update their knowledge in accordance with the most recent evidence-based guidelines.

Capability, level of ability, degree of aptitude, power of proficiency, and strength of expertise are all examples of skill competency. CPR and BLS techniques are useful for every Healthcare provider (HCP) to apply in order to have basic knowledge to deal with life-threatening situations, individual families, friends, neighbours, team institutions, and anyone else involved in an emergency crisis. BLS is very important for healthcare workers, therefore, encouraging young people to get involved and provide them with useful skills, will bring intriguing careers and future development.

### Basic life support training in nursing perspective.

Sunshine et al. (2015) focuses on the factors influencing nurse academic performance for long-term safety practices. Seven indicators contribute to factors influencing academic success, such as distance, teacher-related factor, and surreptitiously the researcher believes home-related factor has little effect on nurses' academic performance. This major change in CPR sequence will necessitate re-education for everyone who has ever learned CPR, but the writers and experts engaged in the formulation of the AHA (2020) guidelines for CPR and ECC are unanimous in their belief that the benefit will outweigh the effort.

Figure 1: AHA (2020) Chains of Survival for adult IHCA and OHCA.




The agenda for sustainable development in CPR discovery adults account for the great majority of cardiac arrests. According to the study, patients of all ages who have a witnessed arrest and an initial rhythm of ventricular fibrillation (VF) or pulseless ventricular tachycardia have the greatest survival rates from cardiac arrest (VT) (see, Figure 1)

The availability of a trained instructor, followed by regular practice on a manikin, is the challenge of CPR in building BLS skills among nursing trainees. As a result, the BLS trainee will achieve and retain complete proficiency. The knowledge and skills gained could benefit healthcare organizations, patients' health outcomes, and community quality of life (Mohamed & Azizan, 2015). Hence, knowledge and skill development is a crucial component of professional development in the nursing profession. The issue of nurses in BLS clinical expertise, on the other hand, necessitates long-term practice. Although the difficulties in obtaining skilled performance is evident, the public expects nurses to be able to execute BLS in the event of cardiac arrest.

CPR protocol developed by AHA 2020 (see, Table 1) needed the pace of chest compression to 120/minutes to provide the victim with a sensation of life survival, which is accepted by the rest of the globe for safety standards. The logical argument in this case is that 'the longer time spent, the more tissue that may perish'. Furthermore, Krauth (2011) found that after 4-6 minutes of no blood supply, the brain depleted. The importance of high-quality CPR has not waned (with chest compressions of adequate rate and depth, allowing complete chest recoil after each compression, minimizing interruptions in compressions, and avoiding excessive ventilation). The suggested sequence for a lone rescuer to commence chest compressions before providing rescue breaths (C-

A-B. AHA) has changed (2020). To shorten the time it takes to perform the initial compression, the lone rescuer should begin CPR with 30 compressions continuously rather than two ventilations. The compression rate should be between 100 and 120 compressions per minute. Adult compression depth has been at least 2 inches (5 cm).

Table 1: Adapted AHA guideline 2020

 ADAPTED AHA SUMMARY TABLE (2020) BASIC LIFE SUPPORT YY (2022) UPDATES			
Component	Adult and adolescent	Children (1 year to puberty)	Infant Age less than 1 year
Scene safety	Environment must safe for rescuer and victim		
Recognition of cardiac arrest	Check for responsive No breathing or only gasping (i.e., No normal breathing) No definite pulse felt within 10 sec (Breathing and pulse check can be performed simultaneously can be check less than 10sec)		
Activation of emergency respond system	Alone with no mobile phone, leave the victim to activate EMS and get AED before begin CPR Otherwise send someone and begin CPR immediately	<b>Witnessed collapse:</b> follow step for adult and adolescent on the left <b>Unwitnessed collapse:</b> Gives 2 minutes of CPR Leave the victim to activate EMS and get AED Return to the child and infant resume CPR Use AED as soon as it in available	
Compression ventilation ratio without advanced airway	1 or 2 rescuers 30:2	1 rescuer 30:2 2 or more rescuers 2:15	
Compression ventilation ratio with advanced airway	Continues CPR at a rate of 100-120 per/min Gives 1 breath at 6 seconds (10 breath/minutes)		
Compression rate	100-120/min		
Compression depth	At least 2 inches (5cm)	At least one third AP diameters of chest about 2 inches (5cm),	At least one third AP diameters of chest about 1.5 inches (4cm)
Hand placement	2 hands at the lower half of breastbone (sternum)	2 hands or 1 hand (to small child) at the lower half of breastbone (sternum)	<b>1 rescuer</b> 2 fingers in the center of the chest (just below nipple line) <b>2 or more rescuers</b> 2 thumb -cycling hand to the center of the chest just below nipple line
Chest recoil	Allow full recoil after chest compression, do not lean on the chest after each compression		
Minimizing interaction	Limit interruptions to chest compression to less than 10 seconds		
<ul style="list-style-type: none"><li>• Compression depth should be not more than 2 inches (5 cm)</li><li>• Abbreviation: AED automated external devise , BLS basic life support, AP anteroposterior</li></ul> BLS world 2022 dnyvtrial@gmail.com			

### **AHA new guideline practices 2020**

Table 1 shows AHA new guideline practices for 2020. The remarkable AHA (2020) advised that the rate be at least 100-120 compressions per minute. Extending the compression rate beyond 120 compressions/min may result in decreased cardiac output due to incomplete cardiac filling during chest recoil. Adults should have a depth of 2 inches or less (5-centimeters). According to research evaluated by the ILCOR, compressions performed beyond this depth may raise the risk of resuscitation-related injuries such as rib fractures, which is what prompted this modification in guideline. Sequence CAB (Compressions, Airway, and Breathing) initiated chest compressions without delay for airway assessment or rescue breathing has resulted in better outcomes. Ratio Traditional CPR cycles of 30 chest compressions to two rescue breaths for one-rescuer CPR in all age groups and two-rescuer CPR in adults are still recommended in the 30:2 (2020 guidelines). Hence the 15:2 compression-to-breath ratio is still recommended for two-rescuer CPR on children and infants.

### **CPR in clinical trend.**

The world's challenge and CPR demand in clinical and trend work forces managing severe trauma, major head injury or coma, respiratory and/or hemodynamic insufficiency, or failure of one or more organ systems, and those with intensive monitoring needs following major surgery and requiring intensive care. Patients who are critically sick are those who are at significant risk of current or future life-threatening health problems. The more critically sick a patient is, the more likely he or she is to be extremely susceptible, unstable, and complex, necessitating intense and watchful critical care high intensity fields of work.

The trend is case becoming more complicated, but new technologies and treatments are being introduced, so emergency nurses will need to become more knowledgeable and technological minded. To provide safe and appropriate patient care, nurses and HCP must gain a complete understanding of these modes, including their implications on underlying respiratory physiology. As a notable agenda for future online delivery CPR toward nursing practice, new technology that penetrates in the style of learning is required for future practice.

The method of CPR style delivery in AR and VR may aid in teaching and learning CPR programs to the next generation as technology advances. For example, Holo-BLS can be used as an augmented reality self-instruction training system in which a standard CPR manikin is "augmented" with an interactive virtual environment that recreates realistic scenarios (Pier et al., 2020). With virtual 3D objects linked to the manikin and the surroundings, learners can complete activities using natural gestures, body motions, and vocal orders. While Mandal (2013) maintains that the inquiry on qualities of good nursing care largely involved the nurses' behavior: gentle, calm, courteous, kind, attentive, available, sympathetic, and reassuring. Although academics have identified nurses' characteristics that patients evaluate when rating nursing quality and good nursing care in general, little is known about patients' opinions of nurses' skill in particular. Rapid developments in healthcare and technology have led to fewer hospitalizations. As patient care issues become more complex and new technology and treatments are introduced, emergency and critical care nurses will need to become more knowledgeable managing CPR. An emergency unit is a specialized division of a hospital that provides comprehensive and continuous care to critically sick patients who can benefit from treatment.

Despite a significant increase in resource consumption, the majority of trauma patients can eventually return to varied degrees of functional daily living and independence as a result of improved emergency management. A subset of badly damaged elderly individuals died at a much greater incidence. The senior survivors who entered our rehabilitation institution, on the other hand, fared just as well as the younger patients. With the exception of infants, the aetiology of an arrest is almost invariably suffocation.

### Interpretation of competency model in nursing.

Figure 2: Competency Theoretical Model



Adopted From Tele ICU Guideline (2000): Model For Success.

### Tele-ICU model for success

In the year 2000, the practical competency theoretical model (see, Figure 2) was introduced, with an emphasis on a genuine model that might be effective in applying in the course of the study. The model attempted to emphasize that achieving optimal outcomes is a goal in managing care and service.

According to the findings of the study, the modified competency theoretical model inspires CPR in the style of learning that is more expansive and broad in scope. Aun, Fei, and Mohd Yusof (2019) investigate the notion and skill of learning in different styles, competent communication, collaborative relationships, and care. Optimized technology is utilized in applications such as mobile connections, Whatsapp applications, telegram, tweeter, universities portal teaching and learning channel. However, more technology advance devices are required such as communication technology, drone technology, GPS system, satellite system, and some other technical devices that may be useful in an emergency event. For example, in real-world disasters, having no electrical

power for a few days to a week or more, no water supply, and some of the most basic necessities in this situation, advanced and manual equipment are much necessary.

### **Rational of the study.**

According to Makota, Kibusi, and Schumacher (2019), basic life support is a necessary for everyone. After 4-6 minutes of no blood flow and adequate oxygen supply, normal human tissue, particularly the brain, heart, and kidneys, were depleted. Ischemia may occur in the tissue as a result of a shortage of blood and nutrients for metabolism. Krauth (2011), on the other hand, states that it returns to near-normal after 6 minutes of effective BLS. In clinical practice, the severity of the underlying heart condition is the most critical factor of life support therapy success or failure.

## **2. SIGNIFICANCE OF THE STUDY**

This study may be useful in determining the training needs of health staff. Using mannequins, survival assessment exams are used to represent the performance of the candidate in terms of saving lives. Target post-graduation nursing and HCP must obtain 85 percent of the standard value of practice in order to be competent in lifesaving skills.

## **3. CONCLUSION**

CPR in basic life support is in high demand globally based on study evidence, with the goal of preserving lives. CPR is really effective. According to scientific studies, brain tissue was tired when there was no blood flow or blood supply to a specific place, particularly human vital organ. The author feels that the model of theoretical competency can be utilized as the ideal framework model for future study. The future study could generates a modified theoretical model that could be used to the research path in cardiovascular nursing for safe practice. The nursing philosophy believes in rescuing people with zero errors. Basic life support is a portion of nursing skill that has to be upgraded and explored more in advance technologies to attract more learners to explore in their own style in order to improve nursing quality for the future agenda.

## **References**

- AHA (2020) Highlights of the 2020 American Heart Association Guideline for CPR and ECC. Retrieved from: [https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/highlights/hghlghts\\_2020\\_ecc\\_guidelines\\_english.pdf](https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/highlights/hghlghts_2020_ecc_guidelines_english.pdf), Date retrieved 11/9/2021
- Chandran, K. V., & Abraham, S. V. (2020). Basic Life Support: Need of the Hour--A Study on the Knowledge of Basic Life Support among Young Doctors in India. *Indian Journal of Critical Care Medicine*, 24(5), 332–335. <https://doi-org.newdc.oum.edu.my/10.5005/jp-journals-10071-23442> Retrieved date 26/10/2020
- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Favia, M. J (2010). An Initial Competency Model For Sales Managers At Fifteen B2b Organizations, Retrieved from: [file:///C:/Users/hp/Downloads/Favia\\_Dissertation\\_Final.pdf](file:///C:/Users/hp/Downloads/Favia_Dissertation_Final.pdf), date retrieved 8/11/2015



- Francisco Martín-Rodríguez, Raúl López-Izquierdo, Carlos del Pozo Vegas, Irene Sánchez-Soberón, Juan F. Delgado-Benito, José Luis Martín-Conty, Miguel A. Castro-Villamor (2020) Can the prehospital National Early Warning Score 2 identify patients at risk of in-hospital early mortality? A prospective, multicenter cohort study *Heart & Lung*, 49(5), 585-591. Retrieved from:  
<https://www.sciencedirect.com/science/article/abs/pii/S0147956320300868>, Retrieved date 21/10/2020
- Heart disease and stroke statistic (2017) update: a report from the American Heart Association. *Circulation*. doi: 10.1161/CIR.0000000000000485.
- Law Kian Aun, Teddy Lian Kok Fei, Y. Surahaya Binti Mohd Yusof (2019). The impact of flood from the nursing perspective: A qualitative discovery, *Europe Journal of management and marketing studies*(\*page 51- model attachment)  
<https://oapub.org/soc/index.php/EJMMS/article/view/507>. Retrieved date 12/9/2021
- Krauth, S. A. (2011). Service participation as a predictor of multicultural competency in college graduates: A comparative study of sectarian and non-sectarian institutions.  
<http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1397&context=etd>
- Mohamed, B. and Azizan, N.A. (2015). Perceived service quality's effect on patient satisfaction and behavioural compliance, *International Journal of Health Care Quality Assurance*, 28(3) 300-314. <https://doi.org/10.1108/IJHCQA-06-2014-0074>
- Makota, E. P., Kibusi, S. M., & Schumacher, U. (2019). Evaluating the effects of participatory training in improving knowledge and skills on basic life support among commercial motorcyclists: A quasi-Experimental study in addressing road traffic injuries. *Cogent Medicine*, 6(1), 1–9. <https://doi-org.newdc.oum.edu.my/10.1080/2331205X.2019.1665937>  
[retrieved date 21/10/2020](#)
- Newhard, M. (2010). *An Exploratory Study of Competencies of Appreciative Inquiry Practitioners: Discovery*. (Thesis). Penn State University. Retrieved from  
<https://etda.libraries.psu.edu/paper/10887>  
<https://oatd.org/oatd/search?q=competency+base+education+-nursing+model&form=basic>  
date retrieved 13/11/2015
- Sunshine .B A., Lawrence C. Caranto. Juan, Jose, T. David (2015) factor effecting the academic performance of the student nurses of BSU. *International journal of nursing sciences*, 5(2): 60-65. Date retrieved 24/5/2019
- Tele ICU model of success (2000).<http://www.aacn.org/wd/practice/docs/tele-icu-guidelines.pdf>  
Date retrieved 28/9/2015.