

EBP

e-Newsletter



Emergency & Intensive Care

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EBP Subcommittee Adviser's Message

In this edition, we delve into two crucial aspects of emergency nursing and intensive care nursing: the application of Combat application tourniquet on trauma patients out of hospital setting and the role of nurse-initiated automated external defibrillators (AEDs) in resuscitation.

Emergency nurses play a pivotal role in trauma care, and the proper application of Combat application tourniquet can significantly impact patient outcomes. Writers examined the latest evidence-based practices in US, highlighting the importance of timely and effective Combat application tourniquet use.

In the realm of intensive care nursing, rapid response during cardiac arrest is crucial. Nurse-initiated AED programs have emerged as a valuable approach in resuscitation efforts. Reviewers explored the evidence supporting nurse-led AED use, emphasizing its potential to improve survival rates and enhance patient outcomes. Clinical departments can consider applying this study to nurses in various specialties, considering their experience and CPR training. Enhancing nurses' knowledge, self-efficacy, and providing AED training and defibrillator exposure can improve their role as first responders and save lives.

By embracing these evidence-based practices, emergency and intensive care nurses have the power to make a tangible difference in patient care and outcomes. We commend the nurses who champion these initiatives and express our gratitude for their unwavering commitment to providing exceptional and life-saving care.

Emergency & Intensive Care

Emergency situation poses a serious threat to life or health. Such situations can be happened within or outside the hospitals. As the health care professionals, we must always be prepared for unexpected cases, e.g., accidents or sudden cardiac arrest. Have you heard of using Combat application tourniquet as the first aid to control bleeding outside the hospital? Is it effective and commonly used in Hong Kong? On the other hand, did you experience to initiate AED for cardiac arrest patients at hospital? How does it benefit to patients' outcomes?

In the 7th e-Newsletter, we are delighted to invite ANC (Emergency Care) Mr. Wong Chi Hang and ANC (Intensive Care) Ms. Yeung Mui Fong to present the evidence-based practice in their respective specialties. Mr. Wong and Ms. Yeung may introduce the use of Combat application tourniquet and nurse initiation of AED, as well as provide insights into how these interventions have shown significant outcomes for victims.

We hope that you may find these two articles to be interesting and enjoyable reads. As the Chinese New Year approaches, may we extend our heartfelt wishes for a year filled with prosperity and success.



EBP Editor's Note

Nurse's extended role as a first responder to initiate Automatic External Defibrillation (AED) during resuscitation to save life



ANC (Intensive Care) Yeung Mui Fong

[The relationship between knowledge and self-efficacy of nurses regarding early initiation of cardiopulmonary resuscitation and automated defibrillation in Saudi Arabia \(Alaryani, Alhafaian and Elhady, 2021\)](#)

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Introduction

The outcomes from in-hospital cardiac arrest have improved recently, and **early defibrillation improves patients' survival following ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT)** (Kenward, Castle and Hodgetts, 2002). The nursing profession development in Hong Kong is rapidly evolved, most nurses are the Master degree holders, they are acknowledged as the experts, advocates and advanced quality health care providers in different nursing specialties. Therefore, Nurse's extended role as the first responder to initiate AED should be enhanced in order to improve the outcomes from cardiac arrest.

An absence of timely and correct intervention to sudden cardiac arrest may result to death, therefore, early defibrillation and effective chest compression are crucial to increase the survival of sudden cardiac arrest patients (Travers, Perkins, Berg, et al, 2015).

Training for health care professional especially nurses for early defibrillation plays an essential task because they are always the first witnesses and responders for patient cardiac arrest. Onan et al. (2017) stated that those learners positively accept AED if well-defined and validated training is provided expertly. In Tseung Kwan O hospital, many nurses are trained to use AED to facilitate early defibrillation. Nurse's extended role on using AED is highly supported by management levels. **In 2023, there were 7 patients who developed cardiac arrest and nurse used AED promptly (Figure 1 and Figure 2), finally they could be discharged home successfully (Figure 3)**, which are encouraging for our nurses' profession and competency.

Figure 1

Defibrillation Time

[Pledge: within 5mins for shockable rhythm]
2022 (N:5) vs 2023 (N:9)

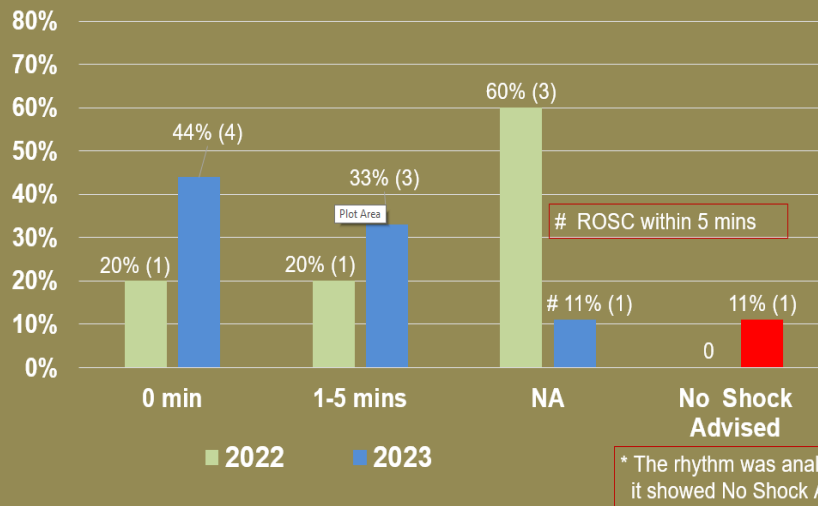
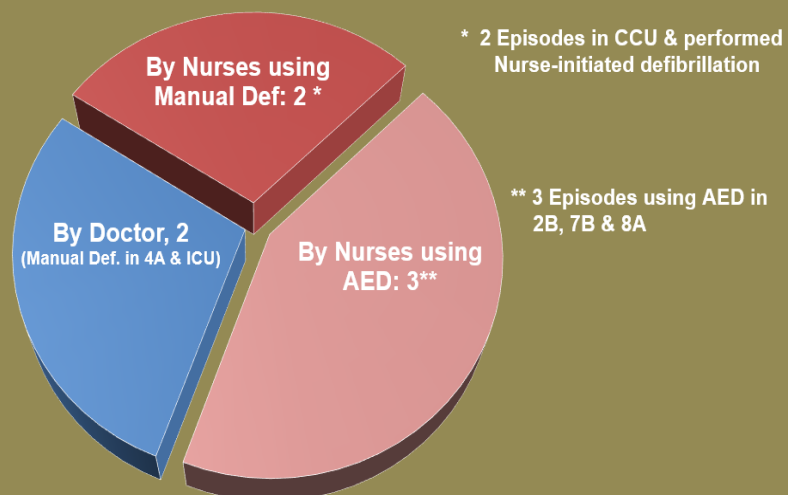
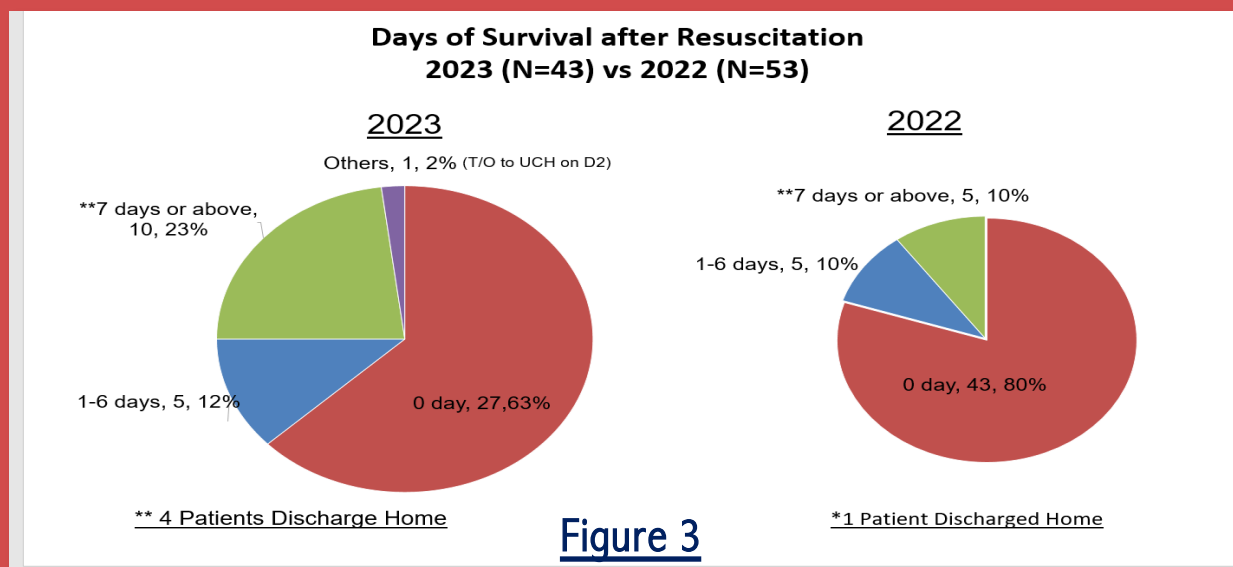


Figure 2

Defibrillation Performed By Episodes 2023 (N=7)





Critical Appraisal

Not only the nurse requires the knowledge when facing cardiac arrest patients, but also self-efficacy, both are considered as significant factors to save life. This article aims to evaluate the relationship between knowledge and self-efficacy of nurses regarding early initiation of cardiopulmonary resuscitation and automated defibrillation.

This is a cross-sectional, descriptive, correctional survey study. A convenience sampling of 287 nurses were selected, the inclusion criteria were registered nurses working in critical areas and inpatient and outpatient departments. The exclusion criteria was nurses who were not working with patients, such as administration personnel.

Three questionnaires were used. The first general questionnaire was used to measure demographic and individual characteristics. The second questionnaire was the Resuscitation Knowledge Scale of Byun (2014) to measure nurses' knowledge about cardio-pulmonary resuscitation (CPR) and early defibrillation. The third questionnaire was the Resuscitation Self-efficacy Scale of Desiani et al (2017) to assess nurses' self-efficacy. Data collection was obtained from November 2020 to January 2021. Descriptive statistics (means, SD, frequencies, percentages, and ranges) and Pearson correlation were used for data analysis. The alpha level of significance was set at 0.05.

In the study, more than half participants (56.4%) had more than ten years of experiences. 62.4% of participants had performed or witnessed CPR more than five times. The results showed 61.3% of nurse had moderate knowledge (13.659 ± 2.175), and 63.8% had high self-efficacy (44.627 ± 58.397).

The highest domain of self-efficacy was responding and rescuing, while the lowest domain was debriefing and recording.

There was a significant positive though weak relationship between knowledge and self- efficacy ($p < 0.001$; $r = 0.207$). The positive relationship explained a high level of self-efficacy if there was a high level of knowledge.

It is recommended that CPR and automated defibrillation curricula can be applied in nurses' internships to improve their practices. The clear policies and procedures, continual updates and on-job-training about CPR and automated defibrillation can enhance and improve knowledge and self-efficacy among health-care workers,

especially for nurses (Alaryani, Alhofaian & Elhady, 2021). In addition, in the study of Aranzábal-Alegría *et al.* (2017), it showed that a lack of exposure to a defibrillator during training could significantly dampen training outcomes, which is another matter that should be considered. This leaves many nurse uncertain about using these devices, leading to less

experience and lower levels of knowledge and self-efficacy (Aranzábal-Alegría *et al.*, 2017).

Conclusion

This study is applicable to nurses working in different specialities which are correlated to their years of experience and CPR experience. AED training with defibrillator use and exposure to a defibrillator play a significant outcome. **As a conclusion, nurses' knowledge and self-efficacy on CPR and initiation of AED should be enhanced to extend their role as a first responder to save life which is an ultimate outcome in a patient journey.**

Nurse initiated AED for Resuscitation

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Is combat application tourniquet effective in trauma patients to improve patients' outcome in hospital setting?



ANC (Emergency Care) Wong Chi Hang

Introduction

Trauma is a major cause of death and disabilities worldwide. According to World Health Organization (2021), there were over 4 million patients died from injuries. Road traffic accident, fall and burn are some of the examples of trauma.

Coagulopathy, acidosis and hypothermia are the traditional lethal triad which lead to death in trauma patients. In addition, more evidence showed that hypocalcemia is another component that can increase the mortality rate among trauma patients. It forms the lethal diamond with other 3 components that mentioned above.

Active bleeding in trauma patients may result in coagulopathy, acidosis, hypothermia and even hypocalcemia. In order to reduce the mortality rate and complications, hemorrhagic control is one of the main strategies in managing patients.

[Effectiveness of pre-hospital tourniquet in emergency patients with major trauma and uncontrolled haemorrhage: a systematic review and meta-analysis \(Latino, et al., 2021\)](#)

Click the title to read the full text of article

Accident and injuries can happen everywhere. There was a grievous incident happened in TKOH last year. The upper limb of a worker was amputated during escalator maintenance work. It was often that bleeding cannot be stopped after applying direct pressure and elevation. Therefore, other equipment may be used for life-saving purpose.

Critical Appraisal

Bleeding control tourniquet is widely used in army for military bleeding injuries. It was firstly used in 1674 on the battlefield. It was also widely used in United States (US) Army after millennium. Combat application tourniquet (CAT) was implemented in pre-hospital and trauma center among US. Besides, there was a tailor-made training course which was developed for the citizens.

It taught them how to apply CAT for first aid. International trauma training courses such as ITLS and TNCC also include the content on the use of CAT. In Hong Kong, ambulance crew has also developed the protocol in applying CAT when managing active bleeding trauma patient. It is considered as a life-saving measure by controlling hemorrhage (Cornelius *et.al.*, 2017).

A systematic review and meta-analysis was conducted by Latina *et al.* (2021). The effectiveness on using CAT in pre-hospital patients with major trauma and uncontrolled bleeding was evaluated. The mortality rate, and use of blood product was analyzed. It was still unclear the effectiveness of using CAT to reduce the mortality rate and blood products as the studies have some limitations.

Four retrospective studies were included in the systematic review and meta-analysis, however, only three studies with reporting adjusted results performed the quantitative analyses.

In the internal validity, since they were affected by the selection bias and outcome domains, the certainty of the evidence was labeled to be low indeed. The review suggested more studies, such as randomized controlled trials (RCT) should be conducted in the future. However, cases requiring application of CAT are critically ill and in an emergency situation. Conducting RCT may be controversial in a lifesaving condition. Therefore, it should be cautious when conducting further RCT among these patients.

Application and Discussion

There is a geographical discrepancy between foreign countries and Hong Kong. The route to hospital or trauma center in Hong Kong is relatively short comparing to US and other countries. As a result, the use of CAT is more common in foreign countries. Massive bleeding can cause death and severe complications even in a short transfer route. CAT can still be used as the last resort in an emergency situation as it can eliminate one of the elements in lethal triad, which is acidosis.

On the other hand, the use of CAT among Hong Kong health workers and citizens is unpopular. The application technique, site of application, and the length of use are the critical skills when applying CAT. Education and training should be provided if it is adopted in hospital setting.

Conclusion

Direct pressure is still the first line treatment in controlling active bleeding, CAT can treat as a last resort in controlling the bleeding among trauma patients in order to eliminate one of the component of lethal triad or lethal diamond.



Summary

1. To recognize the lethal triad /diamond
2. CAT is used for control bleeding in major trauma case as last resort
3. Training and education is essential in applying CAT

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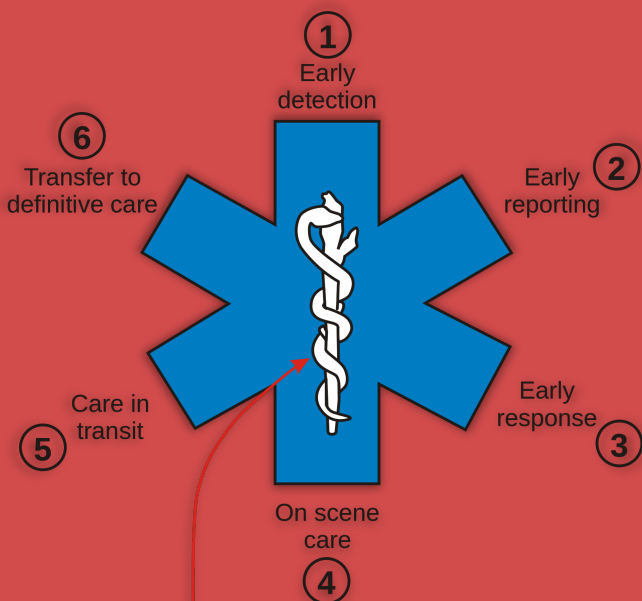
EBP Activities



Journal Club Schedule
○ 14 March 2024



KEC EBP Workshop Advanced Module



The Rod of Asclepius - Ancient Greek symbol of healing

Emergency Medical Services Star of Life

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