Development of an ACLS First-Aid Process Recording System - Saving Lives Is Priceless

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Hualien, a county characterized by its elongated shape, has around 400 OHCA (Out-of hospital cardiac arrest) cases each year. Roughly 50% of these emergency patients are directly transported to Hualien Tzu Chi Hospital by an ambulance. If first aid is performed prior to arrival at the hospital, the survival rate upon hospitalization is around 50%. The Hospital plays an indispensable role in safeguarding the health of east coast residents.

As a key critical care center in eastern Taiwan, Hualien Tzu Chi Hospital accepts critically ill patients from all hospitals in Hualien and Taitung County. Our team has developed an ACLS First-Aid Process Recording System, an AI-based system which is unrivaled in Taiwan. This recording system is a program which has been developed on the foundation of ACLS (Advanced Cardiac Life Support) principles. It has a very simple, intuitive, and user-friendly interface. Upon launch of the system, the program provides guidance in the execution of standardized first-aid procedures and an

In the past, the hospital used a paper-based first-aid record form. The successful development of the ACLS First-Aid Process Recording System has raised the precision and effectiveness of our life-saving efforts.

automatic timer function is activated simultaneously (pulse confirmation every 2 minutes/injection of epinephrine every three minutes). The system alerts users of what actions have to be taken in each period beforehand. It is capable of real-time storage of ACLS processes and utilization of sound for active reminders to identify reversible causes of death. It also provides dosage recommendations for required electric cardioversion. The graphic interface clearly displays contents to be recorded. Upon completion of first-aid procedures, the recorded data is uploaded and saved on a cloud drive. The stored data can be accessed in a convenient and rapid manner, which is highly conducive to the creation of medical records and automatic copying of first-aid time sequence records into nursing records. This helps alleviate the stress of RNs who had to recall all details of the first-aid process in the past and generates significant time savings by automating manual recording processes. Physicians gain the ability to directly import first-aid medication records into the prescription system for issuance of medication orders. This brand-new system helps reduce administrative processing times and frees up precious time for patient care.

The efforts of the emergency care team of Hualien Tzu Chi Hospital in the development and implementation of the ACLS First-Aid Process Recording System are dedicated to saving lives.

When the triage nurse in the emergency room broadcasts via the intercom “OHCA patient in five minutes”, the RNs and physicians on duty feel a rush of adrenaline and gear up with great zeal. All staff members quickly finish their tasks at hand and rush to the first-aid section to assist in the performance of ACLS for the patient who is about to arrive. RNs who are already in the first-aid section divide tasks among themselves. The primary nurse takes responsibility for preparation of the endotracheal tube and the epinephrine, and the assisting nurses take on tasks in sequence. Nurse A volunteers to prepare the manual resuscitator, the sputum suction device, and defibrillator, Nurse B prepares the drip infusion, and Nurse C launches the computer-based ACLS First-Aid Process Recording System. When all preparations are completed, the physician quickly designates tasks to the RNs. The team in full gear

clench their fists in preparation for the tug-of-war with death to save the patient's life. This scenario plays itself out at least once a day in each shift. The team chemistry of the emergency staff members can be grasped with one glance or gesture.

"Two minutes are up, stop chest compression, analyze heart rate", "heart rhythm is changing, confirm pulse", "I have a pulse!!"This message is extremely uplifting for the whole team. The sounds of the patient's heartbeat and the defibrillator resemble a heartwarming infusion.

I still have a fresh memory of a tourist from Kaohsiung who experienced chest tightness and discomfort after an amusement ride in a theme park in Hualien. After being rushed to the hospital in an ambulance for emergency treatment, he suddenly lost consciousness during inquiry in the first-aid section. The RN looked at the defibrillator and yelled "ventricular fibrillation". The physician on duty immediately grabbed the defibrillator, adjusted the electrodes to 150 J, and performed chest compression for two minutes. When the patient came to, he exclaimed "Ouch". This miraculous resuscitation lightened up the faces of all medical staff members in the first-aid section.

After regaining full consciousness, the patient asked us what had just happened and why his chest hurt so much. The physician explained that his chest pain stemmed from ventricular fibrillation and resulting cardiac arrest. "We performed defibrillation and chest compression to pull you back from the gates of death. Now we're going to take you to the Cardiac Catheterization Room to perform cardiac cath."

On the way from the Emergency Room to the Cardiac Catheterization Room, the patient grasped my hand tightly and whispered: "Thank you for all your efforts to save my life! If it hadn't been for you, I might have died far away from home." I was deeply moved when he said that and it suddenly occurred to me that we had saved a person's life.

The latest statistics reveal that the ACLS First-Aid Process Recording System resulted in a significantly improved survival rate of 51.2% and discharge rate with restored neurological functions of 9.7% in 2020 (the respective percentages were 42.6% and 7.6% in 2018 when ACLS procedures were still paper-based). These statistics signal an increase of the aforementioned rates by 8.6% and 2.1% due to the adoption of the ACLS First-Aid Process Recording System. This time-saving and life-saving system is the direct result of the tremendous time and effort put into this project by a large number of staff members. The outstanding results listed above have made these efforts worthwhile.