Review Article

Emergency Medicine

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What is Emergency Medicine and who are the Emergency physician? These may be questions in many people's minds, not just amongst medical personnel but also patients. If we look back 5 years, Emergency Medicine was far from our thoughts and understanding. As we all can imagine, Emergency Departments (ED) in Thailand are mostly chaotic places with lots of patients and physicians who were assigned to attend ED in addition to their daily jobs, on a part-time rotating basis. Those physicians might range from inexperienced extern to boarded physician, and might include specialists from internal medicine, surgery, pediatrics, ophthalmology and otolaryngology, depending on each hospital's policy.

Most of the patients come to the Emergency Room (ER) on their own; some trauma patients are brought by unregulated volunteer ambulance services, such as Ruamkatanyu or Pohtecktung Foundation and rarely, also the Government hospital services. Most volunteers do not possess any real medical knowledge or training in basic life support; nor do they all use appropriate transportation which can provide spine immobilization or splinting. The Emergency Department has its own unique characteristic, a continuous stream of patients with conditions both acute and chronic. However, most patients feel that their condition is an emergency. Conditions may include trauma or non-trauma; there may be mass casualties. The ER needs then, specialized physicians, nurses and most importantly, a streamlined system which regulates out-of-hospital to in-hospital management.

History

In the US, Emergency medicine (EM) was born as a specialty in order to fill the time commitment required by physicians on staff to work in the EDs of the time. The first training program was established at Cincinnati General Hospital in the 1970s and in 1979, EM was voted to be a recognized medical specialty by the American Board of Medical Specialties. At the same period of time, emergency medical services were significantly improved after the publication of National Highway Traffic Safety Administration's study, "Accidental Death and Disability: The neglected Disease of Modern Society". In Thailand, Emergency Medicine was first established as a medical specialty with the permission of Medical Council in 2003. The first boarded Emergency Physicians graduated in 2007. Our Emergency Medical System also gradually evolved. We started from our well known volunteer ambulance services "Pohtecktung foundation" in 1937.[1] In 1972, medical services using radio-systems to serve the rural areas were first operated. Narenthorn, the first well organized Emergency Medical Service

(EMS) unit under authorization of Rajavithi Hospital began to serve the community in 1995.[1] Narenthorn provided a standard ambulance, dispatch center and EMT-B training program. In 2008 the Emergency Medical Institute of Thailand was first developed.[1] Currently, we have 2 dispatch and EMS centers which operate 24/7: Arawan Dispatch Center which covers the Bangkok area and Narenthorn Dispatch center which serves the other 75 Thai provinces.

What is Emergency Medicine and who is Emergency Physician?

By definition the Emergency Medicine is *"a medical specialty - a field of practice based on the knowledge and skills required for the prevention, diagnosis and management of acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioral disorders. It further encompasses an understanding of the development of pre-hospital and in-hospital emergency medical systems and the skills necessary for this development"*.

Emergency physicians require both a broad field of knowledge and advanced procedural skills, which often include surgical procedure, trauma resuscitation, advanced cardiac life support, conduct and interpretation of ultrasound and advanced airway management.

What is the EMS system and why it is important?

An Emergency Medical System is not just the management in the Emergency Room itself. It starts from the recognition of the emergency condition, a telephone assessment of the situation and provision of pre-hospital care through to definitive care in the hospital. A 1966 EMS White Paper stated that in 1965 there were 52,000,000 accidental injuries in the US.[2] Of these accidental injuries, 107,000 people were killed, more than 10,000,000 disabled and 400,000 permanently impaired. The paper also identified that most people did not have basic first aid training. Those who did have some basic training had little to no training for cardio pulmonary resuscitation and other life saving techniques or childbirth.

In Thailand, for the past decades the ambulance services have greatly widely varied in capability. The dispatching has been poor and communication systems in some areas of the country did not exist. There was no standard for ambulance construction. A well developed EMS has a great positive impact on patient outcomes, for both trauma patients and non trauma patients. Public education will help the people to recognize emergency condition such as stroke, cardiac arrest and the knowledge of how to provide first aid (Basic lift support (BLS)).[3-4] Well organized emergency communication systems will help people to more easily access the emergency care. Trained dispatchers and a well developed dispatch protocol will increase the accuracy in clinical assessment from the first phone call within few minutes, so the most appropriate help will be sent to the patient within the appropriate time (The most appropriate help is the nearest ambulance services with the appropriate capacity). An intelligent pre-hospital instruction algorithm provided by trained dispatchers will help by standers to offer first aid while waiting for the Emergency Medical Technicians, (EMT) especially cardiopulmonary resuscitation which will improve the patient outcomes.[5-8] According to the aforementioned White Paper, 10% of patients with cervical spine injuries were made worse by management prior to hospital arrival.[2] Well trained EMS personnel that can properly immobilize the patient and provide standard emergency care would decrease the morbidity and mortality. EMT personnel can also be trained to care for non trauma patients, for example, the first responder can provide BLS, proper immobilization or assist with baby delivery.

As we know time does matter to the outcome in many time-sensitive illnesses, such as stroke and acute MI. With a good transferal system, the patient can be sent to the right place (stroke patient to an experienced stroke unit, ACS patient to the Heart Center etc.) at the right time with the right mode of transport (ground or air-ambulance).[9-10] Emergency departments are busy, overcrowded medical units, so in order to provide the best care for the right patient at the right time, a good triage system will prioritize incoming patients and identify those patients who cannot wait to be seen.

The EMS also includes medical responses to disaster, planning for and provision of medical coverage at mass gatherings and inter-facility transfers of patients. In Thailand, Emergency Medicine is young as a medical specialty and the EMS system has just started. We continue to evolve with our strong goal, that all Thai people will be able to access the Emergency Medical System and receive the same standard of care no matter where and who they are.

BDMS-Emergency Medical Services

The emergency medical service in Bangkok Hospital has grown over the past decades. In 2000, we first established fully equipped mobile ICU and mobile CCU ambulances. Our 24/7 pre-hospital service is a multi tier system which includes ground (ALS and BLS) and air ambulance services. The ALS ambulance is staffed with an Emergency Physician, a Registered Nurse and drivers who have been trained as Emergency Medical Technicians (EMTB) or FR. In emergency situations, the patient can directly access our system by calling 1719 or through Arawan Dispatch Center. With the emergency ambulance services we have developed dispatch protocols

that guide the ambulance's in-charge nurse and the pre-hospital instructions will be provided by the ambulance doctor. The interfacility transfer system is a well organized process, with ambulance teams available round the clock, that will evaluate the patient's pre transferal condition, cooperate with the doctors at transferring facility, in order to properly prepare the patient and plan the management during transfer and at the receiving facility. The Bangkok Helicopter Services is the first medical services emergency helicopter in South East Asia. It was first established in 2005, with a fully equipped aircraft and attended by certified aviation medical doctors and nurses. We continually train our staff. Our emergency doctors and nurses must be certified with ACLS, PALS, ATLS and neonatal life support.

BDMS comprises of Bangkok Hospital Group, Sametivej Hospital Group, BNH Hospital, and Royal Angkor International Hospital and Royal Ratana Hospital in Cambodia. Together we provide unparalleled tertiary medical care in Thailand and neighboring countries. We are currently developing our Emergency Medical Services Network in order to synchronize the emergency system in our group, continually improve the process of care and to provide equally qualified emergency medical personnel (Doctors, Nurses and EMT).

There are 20 hospitals in our network, 8 hospitals located in Bangkok, 4 Hospitals in southern Thailand, 5 hospitals in the East, 1 hospital in the North-East and 2 hospitals in Cambodia. Our mission is to build up a group practice of emergency physicians, nurses and EMTs and set the standard for emergency care, including pre hospital and in hospital systems such as medical triage, dispatch protocols, standard ambulance / equipment and medical policies. We intend to set up a synchronized network, and establish support technology including full EMR and Data management system, GPS, telemedicine etc. We want to ensure continuous improvement of EMS personnel and maintain quality of care via re-certification, regular drills and monitoring of standard KPI.

With a good network system we aim to provide a simple way to access our emergency medical services and the best continuity of care for the patients. This means being a "one stop" medical service: from a single call to initial clinical evaluation, standard pre-arrival instructions, arrangements of proper modes of transportation and interfacility co-ordination, until the patient is safely transferred to the closest appropriate network hospital. Our available modes of transfer include motorance (Bangkok Hospital), hydrolance (transfer by speedboat) (Bangkok Samui Hospital), mobile CCU, mobile ICU, BLS ambulance for ground ambulance services, helicopter and fixed wing for air transportation.

We have more than 20 full time emergency physicians in our network.

Currently there are published studies that support the effectiveness of telemedicine in management of patients in rural hospitals for both trauma and non trauma patients, such as stroke and acute MI.[11-12] Recently we have established telemedicine as a part of stroke care in Bangkok Hua Hin Hospital (a primary care unit) in cooperation with the Stroke team at BMC (Stroke Center). We plan to further develop the telemedical system to cover more medical conditions such as trauma and acute coronary syndrome.

References

1. http://www.emit.go.th/index.php?page=p1_0&menu=1-0
2. Accidental Death and Disability: The neglected disease of modern society : *National Academy of science National research council Washinton DC,* September 1966.
3. Kleindorfer D, Khoury J, Broderick JP, Rademacher E, Woo D, Flaherty ML, Alwell K, Moomaw CJ, Schneider A, Pancioli A, Miller R, Kissela BM. Temporal trends in public awareness of stroke: warning signs, risk factors, and treatment. *Stroke* 2009;40:2502-2506
4. Jones SP, Jenkinson AJ, Leathley MJ, Watkins CL. Stroke knowledge and awareness: an integrative review of the evidence. *Age Ageing* 2010;39:11-22
5. Calle PA, Lagaert L, Vanhaute O, Buylaert WA. Do victims of an out-of-hospital cardiac arrest benefit from a training program for emergency medical dispatchers? *Resuscitation* 1997;35:213-218
6. Emergency medical dispatching: rapid identification and treatment of acute myocardial infarction. National Heart Attack Alert Program Coordinating Committee Access to Care Subcommittee. *Am J Emerg Med* 1995;13:67-73
7. Culley LL, Clark JJ, Eisenberg MS, Larsen MP. Dispatcher-assisted telephone CPR: common delays and time standards for delivery. *Ann Emerg Med* 1991;20:362-366
8. Berdowski J, Beekhuis F, Zwinderman AH, Tijssen JG, Koster RW. Importance of the first link: description and recognition of an out-of hospital cardiac arrest in an emergency call. *Circulation* 2009;119:2096-2102
9. Steg PG, Bonnefoy E, Chabaud S, Lapostolle F, Dubien PY, Cristofini P, Leizorovicz A, Touboul P. Impact of time to treatment on mortality after prehospital fibrinolysis or primary angioplasty: data from the CAPTIM randomized clinical trial. *Circulation* 2003;108:2851-2856
10. Hacke W, Kaste M, Bluhmki E, Brozman M, Davalos A, Guidetti D, Larrue V, Lees KR, Medeghri Z, Machnig T, Schneider D, von Kummer R, Wahlgren N, Toni D. Thrombolysis with alteplase 3 to 4.5 hours after acute ischemic stroke. *N Engl J Med* 2008;359:1317-1329
11. Lee H.Schwamm et al, Recommendation s for the Implementation of Telemedicine within stroke systems of care: A policy Staement From the amercan Heart association: *Stroke* 2009;40;2635-2660
12. Duchesne JC, et al. *J Trauma* 2008;Jan;64(1):92-97