A Critical Look at Critical Care Medicine in Thailand Critical Care Services and Critical Care Workforce: The Current Situation and a Future Perspective

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Critical care medicine, one of the newest medical specialties in Thailand, has had most of its evolution in the past 25 years. There have been many advances and critical care services in major regional hospitals and currently, most university medical centers have become state of the art. Critical care fellowship training; a subspecialty certification of the primary board of internal medicine, anesthesiology, and surgery; has been in place for approximately 14 years. Despite the fact that TSCCM is one of the most active societies in education and training, the number of qualified intensivists in Thailand is still much less than is necessary. In addition, critical care nurses and other related professionals necessary for the ICUs' clinical team falls short in delivering acceptable, high quality, critical care services. In the very near future, Thailand's population will become an increasingly aged society. The movement toward one ASEAN community has prompted government policies to encourage Thailand to become the Medical Hub of Asia as well as a world-class destination for healthcare. Thus, the demand for critical care services will increase disproportionally when compared to the training capacity and its popularity as a specialty to new medical graduates. A critical look at critical care medicine by policymakers and the medical community is a blueprint for preparing and optimizing the critical care workforce regarding future planning and the development of future policies.

Keywords: *Critical illness, Critical care, Intensive care, Workforce shortage, Intensivist*

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Critical illness is a disease or state in which death is imminent. As such, it requires rapid diagnoses and the urgent management of life threatening conditions. There is a need to address the problems of sophisticated organ support and invasive physiological monitoring. Patients requiring intensive care intervention may require support for unstable conditions such as hypertension, hypotension, airway and/or respiratory compromise, acute renal failure, potentially lethal cardiac arrhythmias, and organ system support or replacement therapy for multiple organ system failure as noted in multiple organ dysfunction syndrome[1]. They may also be admitted for intensive or invasive monitoring. One example would be patients who are too unstable to transfer to a less intensively monitored unit in the critical hours after a major surgery.

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Critical Care Medicine

Critical care medicine or intensive care medicine is a branch of medicine that is concerned with the diagnosis and management of patients with life threatening problems. These would be patients who are at risk of death or organ failure and would require sophisticated organ support and invasive monitoring[2]. The reasons for organ system failures are usually complex and are the result of multiple etiologies. The heterogeneity of these patients require a complexity of skills to manage them properly[3]. Critical care medicine is a relatively young but rapidly evolving specialty.

The triage system for the critically injured patient has been in use since World War II. However, the current era of critical care medicine, the actual management and intensive monitoring of critically ill patients, was started in the 1940s-1950s. These events correspond with the widespread epidemic of bulbar polio disease that was associated with respiratory failure in America and in European countries[2,4]. The evolution

of critical care medicine can be traced to its relationship with the initial clinical care areas developed for critically ill patients. These were designated as intensive care units (ICU) in America and intensive therapy units (ITU) in Europe[5]. The development of incubators for newborns, life-support devices for the management of respiratory failure and the restoration of normal renal function, and the reversal of fatal arrhythmias are characterized as the intensive therapy that had evolved in the early 20th century[6]. In the last 50 years, critical care medicine has evolved into a comprehensive and largely, electronic monitored discipline with automated laboratory measurements to assist in guiding the intensive therapy of multi-organ failure by critical care physicians, nurse specialists, pharmacists, and respiratory therapists. This has created a necessity for the use of multiple life-support methodologies and devices in intensive care units (ICUs), highly dependent unit (HDUs), and step down units (SDUs)[7]. In most of the tertiary care medical centers or university hospitals, intensive care units (ICUs) have been specialized to each specific department. These are; the medical intensive care unit (MICU), the surgical intensive care unit (SICU), the pediatric intensive care unit (PICU), and the neonatal intensive care unit (NICU)[7]. Highly dependent units (HDUs) are also categorized as organ system-oriented units in accordance with the majority of the patients in their services. These are known as coronary care units (CCU), respiratory care units (RCU), neurological critical care units (NCCU), spinal care units, burn units (BU)[7], etc.

Thailand and Thai Health Care System

Thailand, officially known as the Kingdom of Thailand, is a country located at the center of the Indochina peninsula in Southeast Asia. It is bordered to the north by Myanmar and Laos, to the east by Laos and Cambodia, to the west by Myanmar, and to the south by the Gulf of Thailand and Malaysia. Thailand is the 20th most-populated country in the world, with approximately 64 million people. The capital and largest city is Bangkok. About 75% of the population is ethnically Thai, 14% are Thai Chinese, and 3% are Malaysian. The remaining 9% belong to minority groups that include the Mons, Khmers and other various hill tribes. The country's official language is Thai. The primary religion is Buddhism, which is practiced by approximately 95% of the population. According to the World Health Organization's Global Health Observatory's report in the year 2009; the life expectancy in Thailand, at birth, is 66 years of age for males and 74 years of age for females[8].

According to National Health Security Office (NHSO) data from this year (2013), 99.5% of the Thai population have at least one health protection coverage plan; 75%, 12.5%, 8%, and 4% are under the universal health coverage scheme (UHCS), the social security scheme (SSC), the civil servant medical benefit scheme (CSMBS), and private insurance policies, respectively[9]. The majority of health care services (80%) here in Thailand are delivered by the public sector. This includes 970 hospitals, 9,768 health promotion stations, and 365 community medical centers. Public health services are primarily organized by Ministry of Public Health, Ministry of Education, Ministry of Defense, and others[10,11]. Non-profit health organizations and the private medical sector provide 20 percent of the health care delivery for self-paying patients, the privately insured, and social security for private employees as shown in Table 1.

The majority of public hospitals (83.47%) are operated under the Ministry of Public Health[10]. There are 743 community hospitals that provide 10, 30, 60, or 120 beds for inpatient services. Most community hospitals do not have ICUs, most critically ill patients are generally transferred to a nearby general or regional hospital[10]. There are 70 general hospitals consisting of 200-500 in patient beds in which there is at least one multi-disciplinary ICU. These ICUs mainly admit patients from their primary care doctors. The proportion of ICU beds to hospital beds is roughly 3-5% of the overall bed count[10]. There are 26 regional hospitals ranging in size anywhere from 500-1,800 in patient beds. These are located in the major provinces and act as regional referral centers for community hospitals and general hospitals in the nearby provinces. They may have 2-3 specialized ICUs who are more specific to departmental and specific organ system oriented units[10]. The remaining 16.53% of the public hospitals are university hospitals and medical centers operated under the university affairs of the Ministry of Education, Ministry of Defense, and local administrative organizations. Private hospitals provide about 20% of health care delivery for self-paid and privately insured patients[12].

Critical Care Medicine in Thailand

Most of the university hospitals and major regional hospitals in Thailand have had established intensive care units since the 1960s-1970s. During that period, ICU beds numbered only about 1-2% of the total beds in the hospitals and they were all

Table 1. Health Care System and Health Care Provider in Thailand

	Public Service			Private Service	
Administration	Ministry of Public Health	Ministry of Education	Other Public Services	Private Entrepreneurs	Non-profit Organization
Central	48 Specialized Hospitals				
Province	26 Regional Hospitals 71 General Hospitals	15 University Hospitals	67 Army, Police, Local Administration, & etc Hospitals	322 Private & NGO Hospitals	
District	743 Community Hospitals			17,671 Private Medical Offices/Clinics	11,154 Pharmacy & Drug Store
Sub-district	9,786 Health Promotion Center 365 Community Medical Centers				

multidisciplinary, open ICUs. The primary ICU team consisted of an attending physician and a team of intensive care nurses.

In the 1980s, Siriraj Medical center of the Siriraj medical school, Mahidol University, the first medical school of Thailand started a hybrid surgical intensive care unit (SICU). This was monitored by a group of anesthesiologists. The patients received surgical treatment from a primary care surgeon and the ICU attending staff (anesthesiologists) provided care for related critical illnesses.

In 1988; a group of intensivists (critical care practitioners) from various specialties; including anesthesiologists, surgeons, pediatricians, pulmonologists and cardiologists, came together and organized "The Association of Critical Care Medicine of Thailand (ACCMT)". In 1990, the ACCMT was reorganized as the Society of Critical Care Medicine (TSCCM) with the aim of learning, practicing, and sharing advances and improvements in sciences and in the clinical management of critically ill patients. Currently, the TSCCM has 595 active members who are physicians, 1,063 members who are registered nurses (RN) and affiliate members.

A joint committee under the Royal College of Physicians of Thailand (RCPT) has developed a curriculum for training critical care clinical fellows that has been approved by the Thai Medical Council (TMC) in 1998. The critical care, clinical, fellowship-training program is a two-year subspecialty and has recruited qualified physicians who have received certifications in internal medicine, anesthesiology, or surgery. The first cohort of critical care, clinical, fellowship training started in 1999. Since then, the TSCCM has certified 66 intensivists and has awarded 117 subspecialty certifications, issued by the Thai board in critical care medicine to qualified Thai doctors. These physicians had been fully trained in critical care medicine or intensive care medicine from the USA, the United Kingdom, and Australia. In 2013, the TSCCM established 15 clinical fellowship-training programs in 6 training centers for critical care medicine.

Critical Care Services in Thailand

The majority of the 743 community hospitals do not provide critical care services. General hospitals and some of the smaller regional hospitals provide critical care services with multidisciplinary intensive care units. The number of ICU-beds is approximately 3-5 percent of all in-patient beds. These units are open for admissions from any doctor who eventually becomes the primary care physician in the ICUs working in collaboration with critical care nurses and consulting physicians from various departments in accord to the patients' needs. The major regional hospitals and university hospitals provide critical care services through multiple intensive care units that are departmental and organ system-based. The attending physicians are usually from the departments of internal medicine, particularly in the MICUs. Most of the physician-based intensivists are from the division of pulmonary medicine, critical care medicine, or from the cardiology department. Anesthesiologists serving as intensivists from their respective departments of anesthesiology provide critical care services in SICUs. Because of the limited number of intensivists, most intensive care units in general hospitals and regional hospitals are open ICUs. Primary care physicians are

also the primary attending physicians in ICUs. Only a few units of MICUs and SICUs in the university hospitals are organized as closed ICUs. Most MICUs provide critical care services by pulmonologist/ intensivists. SICUs are organized as hybrid ICUs in which critical care services are provided by an anesthesiologist/intensivist and a primary care surgeon.

Current Situation of Critical Care Workforce

Among the 42,890 registered medical doctors, 33,000 are currently active medical practitioners[13]. The overall doctor to population ratio in Thailand is 1:1,985[8]. Approximately 80% of the active practitioners are working in the public sector, and the others are in either the private sector or working in non-profit organizations. The estimated need of medical doctors in public service will be near 10,720 in 2015.

Since the TSCCM had started the first group of critical care medicine subspecialty trainees here in Thailand in the year 1999, the TSCCM has certified an average of 10 new intensivists every year. The number of intensivists in Thailand has gradually increased since the year 2000. Currently, there are 183 certified intensivists and these include pulmonologist-intensivists, anesthesiologist-intensivists, intensivists, and surgical intensivists. From the recommendations of the Statement from the Society of Critical Care Medicine Taskforce on ICU Staffing, the number of full-time equivalent intensivists to ICU beds should not be less than 1:14. This is the number necessary to deliver appropriate, acceptable critical care services[14-16]. According to the approximately 7,850 ICU beds in general hospitals, regional hospitals, specialized hospitals, university hospitals, and private hospitals, the number of full-time equivalent intensivists in Thailand should number at least 560 by the year 2013. As most intensivists in Thailand are half-time and part-time intensivists, the country's requirement should be raised to approximately 1,120 or more. Unfortunately, the actual number of intensivists in Thailand is remains far less than the country's requirement for acceptable critical care delivery[17].

Most of the 129,240 registered nurses in Thailand are active nurse practitioners here in this the current year of 2013. Of these, 88% are working in public services. The critical care nurse training program in Thailand is a continuous professional development training program and operates by what is termed, "on the job training" along with some additional, short-course training courses in critical care medicine. Currently, there is no certification system for critical care nursing. Presently, critical care nursing has the highest vacancy rate and the highest turnover rate in most of the regional hospitals and university hospitals here in Thailand[18].

Future perspective

With the increase of the elderly population in Thailand, 12%, 17%, and 27% forecasted for the years of 2020, 2030, and 2050, respectively; the number of complex critical illnesses seen in the elderly populations will also inevitably increase[19]. In accordance to the public's expectations for high quality care, the drive to join the ASEAN Economic Community (AEC) in 2015, the government's policy to transform Thailand into an Asian medical hub, and the push to market Thailand as a World-class healthcare destination, the need for more critical care beds, intensivists and critical care nurses will be significantly higher in the near future. While the supply is reduced as a result of a more stressful working environment, constraints from low salaries and inadequate benefits packages for public services in combination with limited training programs and limited positions, the number of intensivists in Thailand will be far behind the needs of the country by the year 2050[20] (Fig. 1).

In Thailand, nursing shortages remain a national problem. This is articularly noted in the public sector where the shortage of critical care nurses is much more predominant. The critical care nursing services have significant vacancy rates and higher turnover rates in comparison to other nursing departments in the regional hospitals and university hospitals[21]. Presently, there are no schools for respiratory therapists and no specialized pharmacist training programs in the field of critical care medicine. If the current trend continues, the shortages of intensivist combined with the current shortages of critical care nurses,

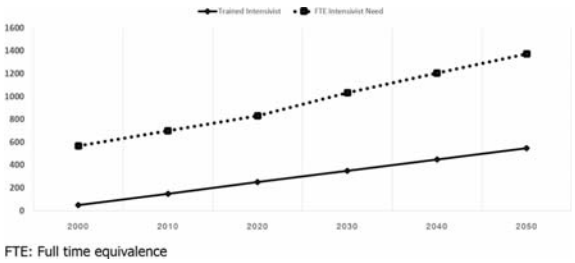

Fig. 1 Estimate number of full-time equivalence of intensivist need for acceptable quality critical care delivery and the actual number of intensivist.

pharmacists, and respiratory therapists, will become a greater problem by the year 2020 and will become critical by the year 2050.

Summary

A critical look at critical care medicine in Thailand found that the practice of critical care medicine in Thailand is in an unhealthy state. Critical care medicine in Thailand has been in place for 25 years and has developed into a distinctive and dominant medical subspecialty in the aspects of education and training. However, the number of critical care specialists, in particular intensivists and critical care nurses, are much lower than the standard criteria requires to deliver quality critical care. There are many barriers to enforcing successful workforce policies. These specialties are commonly misunderstood by policymakers and are regarded as expensive and an excessive consumption of resources. The fact that well-organized critical care could improve patient outcomes, save lives, save costs, and reduce ICU and hospital lengths of stay is under appreciated. Poorly organized ICUs and critical care delivery impacts survival rates, prolongs ICU and hospital lengths of stay, increases hospital acquired complications, and increases overall healthcare costs at the national level. While reducing the demand for the practices of critical care medicine is not possible and unethical in many aspects, increasing the supply may not be possible without strong policies to create a more comfortable working environment in the ICU. There is a need for medical and legal support regarding critical decision-making to ascertain optimal use of healthcares' resources. There is also a need to improve benefits packages to assist in the recruitment of a new generation of critical care specialists.

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Potential conflicts of interest

None.

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การมองเชิงวิเคราะห์เวชบำบัดวิกฤตในประเทศไทย การบริการเวชบำบัดวิกฤตและกำลังคนด้านเวชบำบัดวิกฤต: สถานการณ์ปัจจุบันและมองไปในอนาคต

บุญส่ง พัจนสุนทร

เวชบำบัดวิกฤตเป็นสาขาวิชาทางการแพทย์ที่ค่อนข้างใหม่ในประเทศไทย การรวมตัวเป็นสมาคมวิชาชีพด้านเวชบำบัดวิกฤต ได้เริ่มต้นมาเมื่อประมาณ 25 ปี การฝึกอบรมแพทย์ผู้เชี่ยวชาญในระดับอนุสาขาเวชบำบัดวิกฤต เริ่มมา 14 ปี โดยต่อยอดจากแพทย์ที่ผ่านการอบรมเป็นอายุรแพทย์ วิสัญญีแพทย์และศัลยแพทย์ ปัจจุบันจำนวนแพทย์เวชบำบัดวิกฤต พยาบาลเวชบำบัดวิกฤตและสาขาวิชาชีพที่เป็นผู้ร่วมปฏิบัติงานในหออภิบาล ระยะวิกฤตในประเทศไทยยังอยู่ในระดับที่ขาดแคลน ความขาดแคลนบุคลากรกลุ่มนี้มีแนวโน้มมากขึ้น เนื่องจากความต้องการการดูแลด้านเวชบำบัดวิกฤตที่เพิ่มขึ้นจากการมีสัดส่วนประชากรสูงอายุเพิ่มขึ้นอย่างต่อเนื่อง การเคลื่อนย้ายบุคลากรเมื่อรวมเป็นกลุ่มประเทศเอเชียตะวันออกเฉียงใต้ และนโยบายของภาครัฐที่ต้องการผลักดันให้ไทยเป็นศูนย์ดูแลสุขภาพสำหรับเอเชีย และเป็นศูนย์กลางการดูแลสุขภาพระดับโลก ปัญหาการขาดแคลนบุคลากร ด้านเวชบำบัดวิกฤตและแนวโน้มการขาดแคลนเพิ่มขึ้นนี้ควรได้รับการดูแลจากผู้บริหารระดับสูง ผู้ดูแลนโยบายและผู้บริหารในวงการแพทย์ เพื่อเตรียมแผนและดำเนินการรองรับเพื่อแก้ปัญหาและลดความรุนแรงของการขาดแคลนบุคลากรกลุ่มนี้ของประเทศ