

ORIGIN AND HISTORY OF EMERGENCY MEDICINE AND TRAUMA CARE – INDIAN PROSPECTIVE

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ABSTRACT:

Emergency medicine is a medical specialty—a field of practice based on the knowledge and skills required to prevent, diagnose, and manage acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioural 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

The future of the emergency medicine will be characterized by continuous advances in practices, research, technologies, and so forth. In terms of clinical practices, problems such as inefficiency and crowding may arise and cause tension in emergency departments. The development of emergency medicine is still in its primary stage and is extremely uneven between rural and urban areas. The resolution of such issues and optimization of processes in emergency medicine can be realized by implementing an increasing number of equipment configurations, improving the structure of emergency medical personnel, and establishing a closer linkage between out-of-hospital and in-hospital emergency services. In essence, “process optimization and early treatment” manifests as an influential component in the development of emergency medicine. In the optimization of the emergency process, the stability of emergency medical professionals is a valuable resource. In this original paper inspiring in the true story of emergency medical service as provided in tertiary care medical college hospital we the academic emergency medicine team tried to have a glimpse of past present and future of EM, through upgrading clinical emergency care competence, including rapid response, effectiveness, and service attitude, and improving the skills of medical professionals in the emergency department are of great importance.

KEYWORDS:

Emergency, Emergency Medicine, Medical Education, Medicine, Medical Training, Charaka Samhita, Shusruta Samhita, Rational Therapy, Advocated Harmony, Medicine Practitioners, Medical Practitioners, Modern Medicine, Medical Discipline, Continuous Reform, Process Optimization, Big Data, Teaching Management System, Precision Medicine, ED / Emergency Department, Research and Clinical work, Artificial Intelligence (AI), EMS / Emergency Medical System, School of Thoughts, Development of Emergency Medicine.

INTRODUCTION

The term “emergency,” first used in the 1630s, is derived from the Latin word *emergere*, meaning unforeseen events that require immediate attention. The term “emergency medicine” can be traced to the French Revolution (1789–1799). In 1792, Dominique Jean Larrey, a military medical surgeon, gained a position in the Army of the Rhine and left for Strasbourg, where he witnessed great mobility of the horse artillery and then suggested that General Adam Philippe de Custine have the medical staff use this method to speed up transport of the wounded. The general approved Larrey's proposal. Larrey's “ambulance” was a simple carriage, despite the exposure to enemy fire. In 1797, during the first Italian campaign, Larrey created a complete rescue system with an active medical team in the battlefield. In contrast to previous rescue methods, Larrey transported critically wounded patients to the rescue station and operated on them as soon as possible, instead of delaying the operation after the battle. The timely rescue system created by him enabled every wounded soldier to be treated within 24 hours, which significantly reduced the mortality rate. Therefore, Larrey has often been referred to as “the father of emergency medical services.”^[1]

MEDICINE, as professional field, dates back to the early 19th century, while Emergency Medicine can only be traced back to 50 years ago, making it the most recently developed major field in medicine. Before the 1960s, staff in hospital emergency departments usually worked in rotation with family doctors, general surgeons, physicians, and other specialists. In many small emergency departments, nurses conducted the triage of patients, and specialty doctors were called in based on the type of injury or disease. Many pioneers of emergency medicine were family doctors and other specialists, who believed that extra training in first aid was necessary. A group of doctors left their professional positions and devoted themselves to education. In 1952, Maurice Ellis was appointed as the first “first aid consultant” at Leeds General Infirmary in England. In 1967, the Casualty Surgeons Association was founded, with Maurice Ellis as its president. In 1961, in the United States, Dr James DeWitt Mills, along with 4 assistant physicians, established 24/7 emergency care at Alexandria Hospital in Alexandria, Virginia; it was later known as the Alexandria Plan. In 1970, the University of Cincinnati launched the first emergency resident physician program in the world. In 1971, the University of Southern California became the first American medical school to establish a department of emergency medicine. History was made in 1979, when the American Board of Medical Specialties voted to make emergency medicine a recognized medical specialty in the United States.

Medical Education in Ancient & Modern India:

MEDICINE as separate discipline appeared by the second century BCE. MEDICAL EDUCATION was pursued after finishing the basic education. Medical training was imparted by the teachers in their ashramas. The University of Taxila was well known for the study of medicine in ancient India, students trained here were held in high regard. Ayurvedic pupils belonged to different castes and classes. Charaka says that the purpose of studying medicine varied for different castes. Brahmins studied medicine out of empathy, Kshatriyas wished to keep people safe, whereas Vaishyas did it for monetary gains. Sushruta Samhita says that Sudras could also pursue medicine if they came from a good family. One hardly finds references to families of physicians. According to CHARAKA SAMHITA, students hailing from such families were preferentially admitted. However, at the same time, Charaka asserts that it is training, not birth, that makes a vaidya. SUSHRUTA SAMHITA describes in detail the internal character and external built of a pupil who is to be admitted as a medical student. This admission process was very stringent. A medical student was expected to be honest, humble, temperate, generous, and hard-working. He was not supposed to be enamored with women or engage in gambling or hunting. His memory and academic performance were also given importance.

The medical student was admitted via a proper ceremony. He was expected to follow a strict code of conduct and behavior. The legend of Jivaka tells us that medical training was acquired over a lengthy duration of 7 years. Rote learning being an integral part of medical education, students were expected to memorize the classical texts and their commentaries. They were also encouraged to study popular beliefs, folklore, and Bhuta Vidya. Practical training was an important part of Ayurvedic studies. Watching their teacher curing the ill, and aiding him in the preparation of drugs resulted in a lot of learning. As part of their surgical training, Sushruta advises Ayurvedic students to practice surgical procedures on vegetables, fruits, and body parts of animals. For anatomical knowledge, Sushruta recommended careful observation of a dead body. Charaka also suggests learning how to identify herbs. After finishing medical education, the pupil was to improve upon his enunciation, conversational skill, and understand

Emergence of Ayurveda-

MEDICAL OBSERVATION AND THEORIZATION in the Vedic period laid the foundation for a more rational and methodical system of Indian medicine known as AYURVEDA (THE SCIENCE OF LIFE) beginning from 600 BCE. The Ayurvedic practitioner was called vaidya, meaning a person of profound knowledge. Evidence for the medicinal ideas and practices of India in the period from 600-200 BCE is derived from accounts of the contemporary Greek visitors to India, Buddhist texts, and Chanakya's Arthashastra. Ayurvedic theory, most historians refer to the two Sanskrit medical texts dating from early

centuries of Christian era, the Charaka Samhita (Charaka's collection) and Sushruta Samhita (Sushruta's collection). Vagbhatta's Astangahrdaya dated seventh century CE is another important text of Ayurveda. References to Ayurveda are also found in epics, Jatakas, travel accounts, and other literature dating to early centuries of Christian era.

The roots of Ayurveda lay in the Atharva Veda in its reliance on medicinal value of plants and other matter. However, Ayurveda emerged as a fully developed rational theory of health and disease, purposefully veering away from magico-religious and empirical thinking. The Charaka Samhita sought to teach the physician the foundational ideas of logic so that diagnosis and treatment could be based on valid observations and reasoning. Ayurveda did retain some of its Atharva Vedic roots in the form of a branch called Bhuta vidya (psychiatry and demonology).

Ayurveda is regarded as an example of INTELLECTUAL COHERENCE – vaidyas applied its tenets consistently to the biological world of humans, animals, and plants. Vaidyas thought of each individual as unique, and paid particular attention to the constitution of the individual. Central to Ayurveda is the tridosa or the three humoral theory of vata, pitta, and kapha, and all physical, physiological processes as well as the pathological causation of disease are explained in terms of the three dosas. Though translated in English as the three humors or as wind, bile, and phlegm, respectively, they had much wider meanings for vaidyas. Equilibrium of the three dosas manifested as health whereas the disequilibrium or disharmony of these three resulted in disease. Each of the seven dhatus or constituents of the body could be affected by this disequilibrium.

Ayurveda grew as a scientific discipline through discourses and discussions among the sages of the time in symposia and conferences. In fact, discussions and exchange of ideas were very much encouraged among the vaidyas, to help standardize the Ayurvedic theory.

Ayurvedic Methods-

The vaidya primarily made use of what is called RATIONAL THERAPY. He examined the individual as a whole and not just his disease. He took careful note of the patient's innate physiology, mental state, and other factors such as age, food habits, and season of occurrence of disease. Similar to a modern physician, the vaidya conducted a thorough examination using both direct perception (pratyaksa) and inference (anumana). In addition, oral or written testimony of the personal experience of Ayurvedic experts was also accepted as a diagnostic tool (aptopadesa). The vaidya was also expected to question the patient in great detail (prasna), conduct a thorough physical examination using all his five senses (pancendriya pariksa), and confirm or negate his diagnosis

through experimentation (yukti). Pulse examination is not mentioned in the classical Ayurvedic texts.

Ayurvedic therapeutics consist of both purificatory and curative methods. Purification, both internal and external, is achieved through a systematic procedure of panchakarma (five processes). Curative methods involve various means and measures to restore the balance of the vitiated dosas. While the Charaka Samhita primarily discourses on therapeutics, various surgical procedures have been described in detail in the Sushruta Samhita.

Ancient texts place a lot of emphasis on the vaidya's knowledge of drugs. While prescribing a drug, a vaidya was supposed to keep in mind both its therapeutic and adverse effects. The vaidya collected the herbs and other ingredients at auspicious times, spiritualized them with the recitation of mantras, and used them to prepare his own drugs. Vaidyas laid equal emphasis on the cure of disease as well as prevention and health promotion. They prescribed a daily and seasonal routine as well as attention to nutrition for maintenance of a balanced state of health. They **ADVOCATED HARMONY** of body and mind, and a harmonious interaction between man and universe for a healthy life. Vaidyas resorted to spiritual therapy for diseases whose cause were unknown. These were explained in terms of a patient's actions in his previous births. The cure involved appeasement of gods through prayers and offerings, recitation of mantras, and wearing of amulets and gems. Similarly, psychic therapy was applied to diseases of the mind. The Vaidya prescribed various methods at his discretion, to keep the mind away from harmful thoughts.

The Vedic Healer-

The earliest reliable information about **MEDICINE AND MEDICAL PRACTITIONERS** in India is available beginning from 1500 BCE. We get insights into the medicinal practices of the Vedic period (1500-600 BCE) from the four Vedas along with their Brahmanas, Aranyakas, and Upanishads. The Vedic people regarded the spirits of all objects in the world as gods. The ailments of the human body were attributed to divine factors, and magico-religious means were utilized in the cure. The role of the priests was to establish contact between the gods and the humans. They were believed to have the power to summon, pacify, and appease the gods. Priests almost held a magical power over gods through their mantras, and used this power for healing purposes as well. The priest, therefore, was also the healer.

Rig Veda mentions Agni or fire as the emissary connecting the gods with the sacrificer. Therefore, the priests of the Agni cult – the Atharvans, the Angiras, and the Bhrgus – were considered proficient in healing through magico-religious rites. They are also

considered the authors of the Atharva Veda, which contains details about early understanding of human body, its diseases and their cures.

The Vedic people also believed that drinking the juice of the soma plant after offering it in fire sacrifice could bestow one with immortality. This veneration of soma paved the way for the recognition of the extraordinary properties of other plants described in the Atharva Veda. Plants and their products formed the major portion of the materia medica of the Vedic healers. The Rig Veda says, "Knowledgeable healer, the herbs rally together akin to an army of kings." There were individual sages and schools of herbalists who are considered to have identified, described, and propagated the use of particular plants that were often named after the sage. Thus, Kanva was credited with the discovery of the plant apamarga as a medicine, which was then known as Kanva's plant. Other materials included cow's milk and its products, water, and soil from various sources, powdered shells, and rock salt. The Vedic priest would spiritualize the medicine through hymns and sacrifice. Some foods were used as vehicles for certain medicines. In addition to oral medicines, inhalation, fumigation, and topical application of ointments were also done. Certain plants were used as amulets. The medicines were administered at specified places and times. The Vedic priest would attempt to exorcise or propitiate the demonic cause of disease in various ways, some of them quite inventive. The demon could be "trapped" with the means of fire surrounded by a ditch filled with hot water. Fever was "transferred" to a frog tied under the patient's bed. Magico-religious spells and rituals to cure the various diseases abound in the Atharva Veda.

While the divine and demonic origins of disease and health were widely recognized, there were some rational ideas also prevalent, which mostly developed during the Later Vedic (1000-600 BCE) period. The Atharva Veda describes several body parts including bones and internal organs. Certain symptoms such as fever are classified in fair detail, and it is recognized that fever is the "sister" or "cousin" of other diseases. Diseases could also be caused by the derangement of phlegm, wind, or bile, due to seasonal changes, infection with germs or worms, and due to contaminated or unwholesome food. Hereditary diseases were also known.

The Vaidya's-

Medicine for the vaidyas was a full time profession. There were individual practitioners, vaidyas attached to hospitals, and vaidyas employed by the state. There is also mention of itinerant vaidyas, who moved around looking for patients and of vaidyas visiting the patient's house for treatment. Physicians in state service had to attend to the royal family, courtiers, and palace retinue. The highest position among these state physicians was occupied by the king's personal vaidya known as the RAJA-VAIDYA. A physician used to oversee the food cooked in the royal kitchen to ensure the safety of the royal family. Surgeons and physicians (and toxicologists) were regularly employed in

the army both during war and peace. There is mention of eight divisions of Ayurveda in the classical texts, but references to specialist vaidyas are rare. A vaidya was expected to be proficient in all fields of medicine including surgery. There is evidence to show that vaidyas were well paid. For example, in the sources physician Jivaka is described as very wealthy. The physicians in state service received lucrative salaries. vaidyas were paid in both cash and kind. Nonpayment to a vaidya was disapproved, as it was understood that the vaidya needed to spend money to collect herbs and other essentials.

The ancient texts prescribe that a vaidya should not take fee from the Brahmins and should provide them with medicines. He is advised not to treat criminals, bird-snarers, huntsmen, and the opponents of the rulers. There were many checks on the vaidyas. License from the state was a prerequisite for taking up medical practice. Fines were imposed for the incorrect treatment of patients. Yet, the vaidya had a lot of autonomy as the law codes advise not to argue with physicians. Vaidyas were critical of the quacks. Efforts were made to check their growth by promoting standardization of Ayurvedic training and practices. Charaka blames laxity on the part of state for the existence of quacks. Sushruta Samhita prescribes harsh penalties to check these impostors.

Among the renowned physicians of ancient India was a physician named Charaka at the court of Kaniska. It is probable, but not certain, that this physician wrote Charaka Samhita. Dridhbala was a Kashmiri scholar-physician, who later revised and redacted the Charaka Samhita. Others include Sushruta, who composed Sushruta Samhita, Nagarjuna who revised and enlarged it, and Vagbhata who wrote the Ashtangahrdaya. Several Buddhist monks were Ayurvedic pioneers. Perhaps, the most renowned physician of ancient India was Jivaka, to whom numerous stories and legends are attributed. Buddhist references place him in the retinue of Gautama Buddha. Ayurveda found favor among the commoners as well as the upper classes. Vaidyas enjoyed high social status and prestige at par with the upper castes. However, certain legal texts of the period prohibit the physicians from common dining and bar them from ceremonies. Reasons for this exclusion could have been as varied as dread of communicable diseases, or their coming in touch with blood, which was regarded as impure, or because they came in contact with people of all social backgrounds. Absence of female vaidyas is noteworthy. The only mention of a female vaidya is that of Rusa whose work on Ayurveda was translated into Arabic on the order of Abassid caliph Harun al Rashid in the eighth century. As medical education began after the age of maturity, women students could not pursue them since they were married off by this age.

The Ideal Vaidya's-

In Ayurveda, a lot of importance was placed on the acquisition of good qualities by a physician. VAIDYA was expected to be a well-rounded expert, possessing (i) Theoretical Knowledge of Ayurveda, (ii) Experience, (iii) Practical Skill, and (iv) Cleanliness.

The vaidya was expected to always “try to get more and more knowledge without any prejudice.” A certain kind of behavior, befitting the professional, and setting him apart from the charlatan, came to be expected of the vaidya. According to Sushruta, a vaidya should possess resolve, courage, memory, good speech, and peace, whereas quacks lack these qualities. Charaka echoes these sentiments and expounds that the vaidya should be healthy, modest, patient, truthful, skillful, and fearless. He should have a steady hand, a disciplined mind, and not be boastful of his knowledge. SUSHRUTA SAMHITA prescribes the dress code of white or brownish yellow clothes for the vaidya. Ayurvedic preceptors conceived the role of a physician as much more than mere treatment of diseases. He was to help an individual reach the ultimate spiritual goal of self-emancipation, which would not be possible without a healthy mind and body. He was to educate the people about health and disease, and be able to communicate with the lay public and the scholars alike. This required wisdom and skilled communication. Therefore, AYURVEDIC PHYSICIAN was supposed to involve himself in an exclusive study of philosophical topics, participate in professional discourse, and become proficient in the art of public speaking.

Charaka says this about the goal of the vaidya, “Not for self, not for the fulfillment of any earthly desire or gain, but solely for the good of suffering, should you treat your patients and so excel all. Those who sell the treatment of diseases as merchandise gather dust and neglect gold.” The ancient texts talk in detail about the doctor-patient relationship. A vaidya was expected to be friendly and sympathetic toward his patients so that they do not fear him. At the same time, he should have a practical approach: Pay attention to the curable and be indifferent to those likely to die. Charaka recommends that the vaidya keep his conclusions to himself to avoid potential harm. Ayurvedic texts prohibit physicians from private conversations or indulging in jest with women. There are specific instructions regarding the conduct to be followed during a home visit. When a doctor visits the patient in his house, he must be respectful and dress appropriately. He should focus on curing the illness, and refrain from discussing domestic affairs or from announcing the impending death of a patient.

Current state of emergency medicine

EMERGENCY MEDICINE mainly involves rapid assessment, treatment, and triage of critically ill patients, and has transformed from the emergency room to the emergency department or emergency center. Hospitals typically set up a relatively complete emergency medical system of “Out-of-Hospital Emergency Medical Service, In-Hospital Emergency Medical Service, and CRITICAL CARE.” Numerous emergency diagnostic and treatment technologies, such as cardiopulmonary resuscitation, emergency percutaneous coronary intervention, continuous renal replacement therapy, left

ventricular assistive devices, and extracorporeal membrane oxygenation, are applied in emergency medicine. Moreover, a growing number of qualified physicians have devoted themselves to emergency medicine, and several academic platforms have been established, which facilitate knowledge exchange.

With the Continuous Reform of the medical system and the comprehensive implementation and promotion of hierarchical diagnostic and treatment systems from medical reform, the development of emergency medicine is confronted with rare opportunities and more challenges. For example, the construction of emergency systems varies across nations and regions. Practitioners in emergency services have the vital task of establishing a complete emergency diagnosis and treatment system to maintain the daily health of the public and to satisfy the emergency demands of major public health events. It is necessary to move the front of first aid forward, carry out multidisciplinary cooperation, treat all types of critically ill patients, deal with public health emergencies, and boost hierarchical diagnosis and treatment work. Amid the rapid growth of MODERN MEDICINE, advanced technology and innovative drugs continue to emerge. In many cases of emergency work, it is the timely, orderly, and efficient application of these technologies and drugs to the early treatment of critically ill patients that matters. Therefore, "PROCESS OPTIMIZATION AND EARLY TREATMENT" is an important direction in emergency medicine research.

With the development of a MEDICAL DISCIPLINE, each medical specialty is more characterized, and even some single diseases tend to form specialties. Following the law of medical development, emergency medicine also gives full play to specialty characteristics and the development of subspecialties. For example, in areas with a high incidence of cardiovascular diseases, emergency centers have subspecialty focus areas for cardiovascular diseases, and in rural areas with a common occurrence of acute poisoning, emergency departments of primary hospitals establish a subspecialty for the treatment of acute poisoning. In developing subspecialties, emergency medicine focuses on the advancement of diagnostic and treatment technologies for life-threatening diseases and integration with other subspecialties. The construction of High-Quality Subspecialties in Emergency Medicine is conducive to the development of new diagnostic and treatment equipment and technology.

Future of emergency medicine

The coronavirus disease pandemic has brought huge challenges to medical systems, especially emergency medicine. Elevating the capability of early identification, appropriate treatment, and life support for severe or critical patients will always be the core topics of emergency medicine.

Emergency Medicine in the future will be characterized by continuous advances in practices, research, technologies, and so forth. In terms of clinical practices, problems such as inefficiency and crowding may arise and cause tension in emergency departments. The development of emergency medicine is still in its primary stage and is extremely uneven between rural and urban areas. The resolution of such issues and optimization of processes in emergency medicine can be realized by implementing an increasing number of equipment configurations, improving the structure of emergency medical personnel, and establishing a closer linkage between out-of-hospital and in-hospital emergency services. In essence, “Process Optimization and Early Treatment” manifests as an INFLUENTIAL COMPONENT in the development of emergency medicine. In the optimization of the emergency process, the stability of emergency medical professionals is a valuable resource. Upgrading clinical emergency care competence, including rapid response, effectiveness, and service attitude, and improving the skills of medical professionals in the emergency department are of great importance.

The demands for technology are certain to direct the course of emergency services, as the need for timely diagnosis and treatment of patients continues to grow. Information technology can be used to tap available resources and collect information on patients and disease management to aid emergency staff in real time via telemedicine. Specifically, in the absence of specialists or general practitioners on site, the vital signs of patients and critical information can be wirelessly transmitted to experts who can provide remote guidance that may be critical to saving lives. In addition, remote monitoring also enables hospitals to grasp the condition of patients at the earliest time, formulate emergency plans in advance, and ensure a seamless connection between out-of-hospital emergency and in-hospital treatment. By virtue of networks, the real-time transmission of medical devices that monitor information, ambulances' positioning information, and video footage from inside and outside ambulances can facilitate remote consultation and guidance. Moreover, the collection, processing, storage, transmission, and sharing of out-of-hospital emergency information can fully enhance treatment efficiency and service quality, thereby optimizing the process and mode of service.

BIG DATA technology can fully explore medical information to aid in the management and decision-making of EMERGENCY CARE. One of the applications of big data in the medical field is the establishment of a cloud platform for emergency and critical care information management. Such a platform would collect the diagnosis-, examination-, and treatment-related information of patients from databases, such as an emergency logbook, a hospital information system, a picture archiving and communication system, a microbial detection and management system, and a pathology information system. Next, the data were classified, cleaned, extracted, and explored in depth using the platform. Based on this information, teaching management system can be obtained, including a multidisciplinary triage management system, a critical care score and grading

management system, and an early warning system for serious emergencies. The application of big data technology in emergency medicine provides medical practitioners with access to various information databases for each individual and possible treatment options, which will greatly improve teaching efficiency and the ability to diagnose and treat related diseases.

PRECISION MEDICINE is a medical model that fully considers individual differences in the genes, environment, and lifestyle of patients to achieve the most effective treatment and prevention of diseases. The EMERGENCY DEPARTMENT is the first critical link in the clinical diagnosis and treatment of critical illnesses and infectious diseases, and individualized accurate assessment and prevention of disease susceptibility is a valuable research direction for precision emergency medicine. ACUTE INFECTIOUS DISEASES are among the most common diseases in the emergency department. However, given the complexity of diseases, lag in detection technology, and lack of multidimensional clinical information integration technology, the diagnosis and treatment of common diseases such as community-acquired pneumonia remain stagnant. In addition, the emergence of drug-resistant pathogens and emerging microorganisms poses a challenge to empirical therapy protocols. Identifying pathogenic microorganisms quickly and accurately is critical for initiating individualized treatment plans and is also the core component of precision emergency medicine systems. The ideal method of monitoring the outbreak of drug-resistant pathogenic microorganisms in communities or hospitals is to analyse the genetic ancestry of pathogenic microorganisms through genome technology. One of the essential tasks of emergency medicine is to use clinical information to provide individualized diagnosis and treatment for cases without a clear aetiology. To some extent, it is necessary to establish etiological diagnoses through emergency treatment processes. In addition to molecular aetiology diagnoses based on pathogenic specimens (e.g., throat swabs, sputum, and body fluids), diagnostic techniques based on omics information have also seen rapid advances, which will improve precision emergency treatment services. Differential Diagnosis of EMERGENCY AND CRITICAL CARE ILLNESSES, PRECISION EMERGENCY MEDICINE can enhance diagnostic effectiveness significantly with the help of multidimensional and omics data, thus creating the ideal conditions for individualized diagnosis and treatment.

With the combination of BIG DATA AND PRECISION MEDICINE, information technology can promote the growth of Scientific Research and Clinical Work in Emergency Medicine, such as sequencing, information construction, data integration, and analysis, and improve the use of big data in emergency medicine. Under these circumstances, it is possible to achieve breakthroughs in the development of targeted drugs for precision therapy, complete the closed-loop service of precision emergency medicine, and establish a disciplinary system for precision emergency medicine.

ARTIFICIAL INTELLIGENCE (AI) can promote the growth of emergency medicine. Equipped with capabilities in prediction, analysis, and response, artificial intelligence systems can aid emergency staff in diagnosis and treatment. When artificial intelligence tools execute instructions, they can learn from big data through image recognition, speech recognition, human–computer interaction, physical sensing, and other means. After finishing examinations quickly, artificial intelligence tools can formulate a relatively accurate diagnosis and individualized medicine. In addition, artificial intelligence can assist in locating potential risks and threats in advance. In some emergency events, artificial intelligence can assess the situation and predict the required medical services. Another example of artificial intelligence is the use of medical robots. Apart from their application during complex surgeries, medical robots can deliver objects to patients in quarantine and help avoid human contact during virus epidemics. In short, the use of artificial intelligence will undoubtedly benefit emergency medicine in the future.

As more countries are improving their EMERGENCY MEDICAL SYSTEM, the global scale of information exchange is empowering INTERNATIONAL EMERGENCY MEDICINE. Promoting the quality of academic exchange among countries is a priority in the development of international emergency medicine. Moreover, the variety and complexity of emergency diseases pose challenges to timely and accurate emergency medical treatment, and require emergency medical staff to possess rich medical knowledge and accurate judgment.

Although the DEVELOPMENT OF EMERGENCY MEDICINE is confronted with quite a few challenges, it has entered the era of communication among various SCHOOLS OF THOUGHTS. This journey provides opportunities to the field of emergency medicine. With the joint efforts and hard work of stakeholders worldwide, EMERGENCY MEDICINE will accomplish more historic advancements.