Where is critical care medicine in today's undergraduate medical curriculum?

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ABSTRACT

Critical Care Medicine is a well-established specialty in developed countries. Medical students have exposure to it at undergraduate level and it is an independent subspecialty at postgraduate level. However, in the Kingdom of Saudi Arabia, Critical Care Medicine is minimally taught under other subject headings in Surgery, Internal Medicine or Anesthesia. This article discusses the need for the inclusion of Critical Care Medicine in the undergraduate curriculum for better integration of basic and clinical sciences on one hand and improvement of the student's base of knowledge and quality of patient care on the other.

Keywords: Medical education, critical care, curriculum.

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Medical students are expected to learn the skills to resuscitate unstable patients. However, most medical schools do not make provision for Critical Care Medicine as a subject in the core curriculum to teach medical students how to recognize the patient with a life-threatening illness and initiate resuscitative measures on their own. Hence, the Intensive Care Unit (ICU) is an important educational environment for teaching and integrating basic knowledge and skills for resuscitation and management of the critically ill patients. Teaching Cardio-Pulmonary Resuscitation (CPR) became important and has gained acceptance worldwide not only by the medical profession but also by the public at large.[1] Such courses as Advanced Cardiac Life Support (ACLS), Basic Cardiac Life Support (BCLS), Advanced Trauma & Life Support (ATLS) and Fundamental Critical Care Support (FCCS) are good sources to teach students how to save lives in desperate situations no matter whether the young medical graduates end up as primary care or hospital-based physicians or hospital administrators. If medical graduates are not exposed to the management of critically ill patients during their training, their inadequacies, when they are confronted with real life emergency situations, will be blamed on deficiencies attributable to the undergraduate curriculum.[2] It is estimated that a third to a fourth of the hospital budget is spent on critical care services including the ICU.[3] Therefore, effective use of such a resource in medical education is appropriate and beneficial. The 5 medical schools in the Kingdom of Saudi Arabia do not make provision for the teaching of Critical Care Medicine as a subject in their undergraduate curriculum. Critical Care Medicine has always been minimally taught as part of other medical disciplines, and the ICU has seldom been utilized as a learning environment for undergraduates. The undergraduate curriculum in Saudi medical schools may benefit from appraisal and reform to project the need to introduce Critical Care Medicine in a more effective, relevant and cost-effective manner.[4]

The place of Critical Care Medicine in today's curriculum. The discipline of Critical Care Medicine has matured over the past decade and the body of basic and applied knowledge encompassed by the field has undergone remarkable growth.

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Unfortunately, the academic functions of ICUs in hospitals have not developed in parallel with the development and recognition of this discipline. Available resources have given emphasis to the delivery of care in ambulatory clinics and outpatient environments, as more patients are cared for in the outpatient setting. Hence, most critically ill patients are admitted to and remain in hospitals in medical or surgical wards. This, undoubtedly, increases the proportion of the critically ill in-patients. Residents and interns, regardless of their career goals, will be called upon to evaluate these critically ill and unstable patients. They need to be able to recognize symptoms and signs of respiratory and cardiovascular instability. They need to be able to initiate resuscitative therapy and stabilize the patients until appropriate care providers can assist in referring and transporting patients to their appropriate critical care areas, e.g. ICU or Coronary Care Unit (CCU), etc. The increasing demand for care of the critically ill and relative deficiency of the curriculum in this field has created a gap between what the students need to know and what is taught. Although advances in technology, complex and acute illnesses and ethical issues may have widened this gap in recent years, the disparity between what students need to know, and what they are actually taught was recognized years ago.[5] In fact, a number of authors have noted that graduating students lack the basic cognitive and technical skills that enable them to care for unstable patients.[2] For instance, Safar & Grenvik found that 50% of physicians questioned their own ability to perform effective CPR, and as much as 20% of medical schools questioned the ability of their students to perform effective CPR.[6] Murray et al found that less than 50% of medical schools require these skills to be demonstrated by students in First Aid, Emergency Medicine or Critical Care Medicine prior to graduation.[1] In fact, many medical schools still fail to employ evaluation methods that specifically assess students' achievement of the skills and attitudes they need to learn to practice medicine.[7] Critical Care Medicine has developed from application of advances in many clinical disciplines to manage patients with various critical illnesses.[5]

What is the need in today's curriculum? The particular characteristics of critical and emergency medicine can provide a forum for raising awareness and learning broader concepts than those which are specific to critical care medicine. As it is directly related to basic physiologic principles, critical care medicine allows the student to apply concepts such as tissue perfusion, cardiac output, and anaerobic metabolism, that are sometimes unclear in basic sciences. Critical Care Medicine can act as a bridge between basic and clinical disciplines, facilitating understanding and integrating basic and clinical principles distributed among various disciplines. The introduction to multiple-priority, system-oriented patient management and the need to take fast decisions and establish priorities constitutes a good training environment for making decisions and solving problems. Furthermore, Critical Care Medicine provides broad contact with ethical and legal issues. Concepts such as the quality of life or the right to a dignified death must be applied in everyday practice. The trainee needs to develop particular communication skills and sensitivity to patients and their relatives. Finally, contact with advanced technology used in ICUs can provide a framework for the discussion of cost-effectiveness.[8] An outline of a proposed course for undergraduate Critical Care Medicine is given in Table 1.

Table 1 - Outline of a proposed course in undergraduate critical care medicine.

Duration	3 week course
Knowledge	***Basic and Clinical Topics*** * Cardiovascular - Hypotension, Myocardial infarction, Arrhythmia, Vasopressors and Inotropes * Pulmonary - Respiratory distress and failure, airway obstruction * Neurological Central Nervous System - brain injuries, strokes * Renal - Acute renal failure, acide base disturbance * Gastro-intestinal - hemorrhage, liver dysfunction * Hematology - coagulopathy * Infectious diseases common in ICU - fever, nosocomial pneumonia, catheter-related infection * Nutrition
Skills	* Examination of the critically ill patient. * Maintaining the patency of the airway, adequate breathing, circulation (ABC) * Acquaintance with the need for and type of access best suited for critically ill patient, access insertion
Attitudes	* Be able to perform family and patient counseling * Practice and acknowledge of ethics and beliefs by critical appraisal * Be able to cooperate in a multidisciplinary care * Develop appropriate life-long learning skills * Understand the importance of cost-effective use of resources

In conclusion, while most disciplines first develop in the scientific or academic fields, after which the findings are applied in practice, Critical Care Medicine emerged mainly in hospitals, owing to the needs of patients and the pace of technological advances. Introducing and exposing medical students to Critical Care Medicine in medical schools is of paramount importance not only for the acquisition of knowledge but also to enhance cost-effectiveness of available resources and to expose the medical students to contemporary medical and ethical issues.

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