

Management Training in Critical Care Medicine

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Abstract

Critical care medicine is the only specialty fellowship which requires formal training in administrative and management skills by its certifying organisation. The rationale for this is the fact that critical care is responsible for some 1% of gross national product, 10% of hospital beds and 30% of acute hospital costs in the USA. The curriculum required during the fellowship training has been defined. In order for critical care medicine to continue to grow as an academic as well as a successful institutional clinical service, it is important that quality training be provided in this non-clinical part of the fellowship curriculum as well as the clinical aspects.

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Background

Critical care medicine as a specialty has grown rapidly, both clinically and academically, over the past 25 years. In the USA, certification of competence has been awarded to graduates of the critical care medicine fellowship programmes since 1987. There are currently some 250 accredited training programmes based in internal medicine, surgery, anaesthesiology and paediatrics. The most rapid growth in training of intensivists has occurred in the combined pulmonary and critical care medicine programmes. There are some 8000 certified physicians providing direction and care in the 16 000 intensive care units in the USA. Intense work in multidisciplinary environment driven by value analysis gives the intensivist and hospital administrators common grounds for collaboration especially if high grade management training is provided for critical care fellows.

Rationale for Non-clinical Training in Critical Care Medicine

Requirements for training under the primary board defined by the Accreditation Council on Graduate Medical Education (ACGME) have been revised recently. While it is clear that there are major regional and international differences in utilisation of critical care resources,¹ evaluation of impact and demonstration of value of critical care require that intensivists be properly trained in administration and management, as well as in healthcare research techniques. The importance of this is obvious from the massive consumption of health care funding devoted to critical care. In the USA, this is approximately 1% of gross national product and 14% of

gross domestic product, 10% of hospital beds and 30% of acute hospital costs. The clinical training is much better understood, and standards of excellence can be more easily defined for both educators and trainees. Graduates of accredited programmes should be capable of providing quality clinical management of major disease processes such as septic shock, pulmonary oedema, and perioperative complications. Despite this, only about 15% of clinical care in intensive care units can be supported by high grade evidence-based medicine standards, and about 40% of critical care practitioners lack adequate knowledge of basic skills such as haemodynamic diagnosis.²⁻⁴ Dedication to high standards of care for individual patient is in place, and critical reviews of clinical practice and technology are continuing.⁵⁻⁷ The problem occurs in systems management, and intensivists, even though delivering care to individual patients, are institutional advocates with administrative responsibilities.

Guidelines for Training in Critical Care Medicine in the USA

The non-clinical curriculum has been evolving over the past 10 years. The requirements by the ACGME⁸ include:

- the mastery of techniques of organizational, administrative, directorial and management aspects of critical care units
- appointment and training of non-physician personnel
- establishing policies regulating functioning of a criti-

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cal care unit

- coordination of activities of the critical care unit with other in-hospital units
- competence in ethical, economic and legal issues as they pertain to critical care.

In addition, graduates must be competent to assume a leadership role in teaching and in research; they must be skilled in biostatistics, experimental design and interpretation of research studies as well as in assessment of new therapies and of the medical literature.

These guidelines have been supplemented and expanded by the American College of Critical Care Medicine (ACCCM) of the Society of Critical Care Medicine (SCCM) with recommendations⁹ to include expertise in design of special care units, collaborative practice principles, competence in the use of prognostic indices and severity and therapeutic interventions scoring systems, standards for special care units (Joint Commission on Accreditation of Hospital Organizations) and development of critical pathways, medical record keeping and use of electronic databases, effective participation in relevant hospital committees, principles of utilization management and performance improvement, principles of triage and resource allocation, understanding of reimbursement legislation and managed care, development and management of budgets, as well as the principles of writing grants and obtaining funding for research. The vision statements of leaders of critical care medicine¹⁰ suggest that it is of strategic importance to provide excellent training in non-clinical skills including management and healthcare research through the curriculum. Their recommendations urge young intensivists to prove superiority of full-time multidisciplinary ICU based physician-directed teams in improving outcomes, to maintain quality care and patient advocacy in a cost driven environment under health care reform and managed care, and to demonstrate cost-effectiveness through value analysis. Training of an intensivist as a clinician and manager begins in medical school,^{11,12} continues through the residency¹³ and fellowship period. The standards and guidelines for training have been in development for a long time,¹⁴⁻¹⁶ and the non-clinical section has been expanding. Major textbooks in critical care have been gradually increasing the non-clinical content over the past few years. It is now even more important to realize that upon graduation, young intensivists frequently enter a position of responsibility, and lack of basic techniques of management may prevent effective delivery of otherwise competent clinical services.

Surveys of Compliance with Guidelines

In order to evaluate the compliance with the research training section of the non-clinical curriculum, a recent study¹⁷ has surveyed 245 accredited critical care fellowship programmes in the USA. Overall, the programmes

frequently failed to provide formal training in experimental design (46%), statistics (41%), analysis of medical literature (43%), methodology for obtaining research funding (76%), and instruction in outcome-based research (72%). The compliance of the 3-year programmes was better than that of the 1 to 2 year programmes. The study points to the weaknesses in execution of the non-clinical component of the curriculum on a national level.

Critical care is faced with increasing pressures to contain cost. In the past, clinical practice and teaching budgets could support academic services; in the future, the clinical, teaching, research and administrative functions will most likely have to be supported independently. Understanding of the basic methodology of analysis and research in economics of healthcare will be increasingly important.¹⁸⁻²² One of the advances, which should improve our ability to evaluate and deliver critical care, is standardisation.^{23,24} Clinical practice guidelines are systematically developed statements to assist intensivists decide about appropriate healthcare for a specific clinical circumstance. Clinical pathways are more integrated tools to coordinate the daily progress of a typical uncomplicated patient across multiple disciplines over time. Clinical algorithms are a set of more complex instructions containing conditional logic for addressing a particular problem, with decisions and their consequences being expressed in branching logic. Practice guidelines represent notes at certain points along clinical pathways or algorithms, which focus on specific decisions. This methodology is increasingly important in proving the effectiveness and value of critical care to employers and consumers, in addition to developing consensus on the most effective and appropriate care.

Another major critical care organisation, the European Society of Intensive Care Medicine (ESICM), has recently formalised its guidelines for training.^{25,26} A recent survey of critical care teaching in Europe was conducted,²⁷ unfortunately, no information on delivery of non-clinical curriculum in management and research training was presented. It is anticipated that focus on this part of critical care education will be required of training programme directors worldwide.

Hard data grading the quality and quantity of the educational content of the non-clinical curriculum in critical care medicine fellowships are lacking. It is reasonable to expect a significant deficit in teaching and knowledge, since a majority of senior faculty responsible for teaching are trained in clinical and basic science research environments, and acquire management skills informally through working with senior intensivists, or by improvisation.

Business and Leadership Training

The proliferation of management symposia and postgraduate courses directed at intensivists, indicates a

strong interest on the side of the practitioners, and willingness to support the cost of this training by their employers. Professional societies, such as the SCCM, the American College of Chest Physicians and the American Thoracic Society devote increasing blocks of time during their annual scientific symposia to management and business issues, usually under the professional development tracks. While this is commendable, it is quite expensive and is usually directed at mid to upper level faculty, while the primary consumers of this knowledge should be graduating fellows and junior faculty members.

Leadership development is stressed as a training requirement. This is a necessary skill for directing a critical care unit and assuming the required leadership role in teaching and research. Professional societies, such as the SCCM, provide leadership retreats for selected members, which include psychological testing and situational problem-solving, as well as postgraduate courses in this area.²⁸ Institutional interest in this aspect of staff development has increased markedly.

A recent survey of 112 leading medical institutions in the US showed that 31 of the responding institutions offer physician leadership education programme with costs up to US\$250 000 per seminar. Quality management, health care system and economics, leadership development and management principles figured prominently in their curriculum.²⁹ Effective team leadership and directorship of an ICU have a major impact on ICU performance.³⁰⁻³²

Medical economics business training for physicians are becoming increasingly popular with quality hardcover publications oriented towards intensivists beginning to appear.³³ Some critical care medicine fellowship programmes are developing combined degrees in public health or business administration. Several degrees are available for those willing to devote significant personal time and financial resources to their completion. Cost containment and cost effectiveness are the current key words in intensive care.

Some educational programmes, such as the Institute of Health Improvement, are creating multi-institutional network focused on small cycle performance improvement.

Gatekeeping, Information and Health Care Partners

One of the major components and rate limiting steps in managing critical care is gatekeeping and triage. It underwent a significant systematic analysis by the SCCM Ethics Committee, which produced important documents regarding the role of the critical care triage officer,³⁴ and the approach to inadvisable and potentially futile care. Excellent monographs³⁵ defining the state-of-the-art in this area have become available. Intensivists in

Australia have produced a creative approach to systematic identification of patients outside of the critical care unit who may benefit from ICU admission.³⁶

A major danger lies in assumptions regarding the ability of a specific medical insurance plan to affect the access to services, and their effectiveness.^{37,38} A young intensivist needs to be aware of the limitations of scoring systems in triage, and the importance of gatekeeping, new methodologies and approaches to analysing the information.

New ICU directors are frequently faced with the strategic decisions of selecting a database, a clinical information system, as well as the appropriate scoring system for their ICU. The high grade options can be extremely costly both in purchase price and in data collection and entry. While people should always come before electronics and software, administrators of hospitals have begun to understand the importance of seamless electronic records and critical care outcomes data. Formal training of intensivists in this area is in its infancy. The most successful intensivists function as respected leaders of an interdisciplinary team. They must understand the standards and potential in career development for nurses, respiratory therapists, pharmacists and dietitians, and be able to competently assist their non-physician partners to reach their full potential as advanced practitioners.³⁹ With downsizing environment of healthcare, competition between the non-physician advanced practitioners results in cross-training and overall increase in team competence. While licensure limitations vary, physician's assistants and advanced nurse practitioners are able to competently intubate, place pulmonary artery catheters and pacemakers, wean and provide other resident physician services with the added advantage of being permanent staff. Critical care pharmacists are able to deliver input into drug selection, proper dosing, reduce errors and costs, as well as complications due to pharmacologic agents.⁴⁰ The issues of professional cross-training, and usefulness of critical care skills in the institution outside of the ICU are affecting the job profiles. One of the new professional tracks is the intensivist-hospitalist full-time institutional employee responsible for acute care in the ICU, emergency ward and patient care units.⁴¹ While appealing in terms of efficiency, it may interfere with the natural continuity of care, and its economic as well as medical value needs to be proven. Currently, intensivists are not formally trained in skills appropriate for hospitalists or emergency medicine physicians.

The full discussion of the non-clinical curriculum is beyond the scope of this brief paper, but it is becoming clear that additional resources need to be placed in this area of critical care education in order for graduates in the clinical as well as academic career pathways to succeed.

Conclusion

Quality critical care education includes development of competence in administrative and management skills. The best format for teaching and evaluating the non-clinical curriculum remains to be determined.

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