



Improving skills and education in intensive care medicine

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Abstract: In the last decade two main undertakings have transformed education across all medical specialities, namely: (I) the introduction of teaching and assessing “soft skills”; (II) the global use of digital education and digitalised health care delivery. This review will look at the impact of these two events in teaching competencies in the field of intensive care medicine (ICM). ICM is a relatively new discipline and training in ICM is variable across Europe. The framework of competency based training in ICM in Europe has been defined by the Competency Based Training programme in ICM for Europe and outside regions (CoBaTrICE, www.cobatrice.org) in some countries and by local National Training Programs in others. There are also some European countries that still use traditional training methods and do not undertake competency based training. Whilst traditional training methods have been criticized, the implementation of competency based training has never been followed by international research to prove its benefit. In the CoBaTrICE curriculum, there are several competences that relate to professionalism, leadership and soft skills. Communication, professionalism, negotiation and team working are all essential skills to the intensive care doctor. This review will suggest new methodologies and areas for development in teaching and assessing soft skills. The digital era represents the second challenge in education in ICM. Learning with the aid of technology seems beneficial and this might relate to the fact that adults learn (andragogy) best using spontaneous learning. Digital education mediated by several tools (blogs, webinars, social media) can facilitate spontaneous learning and thus adult education. Challenges of digitalised education are related to quality control issues, rapid adoption of literature into clinical practice without the presence of a systematic rigorous peer review process. Finally, research has highlighted the benefit of technologies that help clinicians to manage the exponential growth in medical information. Clinical decision support systems (CDSSs) can improve the quality of patient care and improve patient safety. This review will explore improvements and projects relating to use of CDSSs in the field of ICM.

Keywords: Education in intensive care medicine (ICM); professionalism; digital education; skills in intensive care medicine

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Introduction

Over the last decade major changes have transformed education across all medical specialties. Two main events have driven these changes, namely: (I) teaching and assessing “soft skills”; (II) the global use of digital education as well as digitalised health care. We will present a short summary on why and how these two innovations have recently improved individual competencies and changed education in intensive care medicine (ICM).

Background

Intensive care doctors' training and accreditation programs are based on a set of competencies which are defined at a national level by the National Training Organizations (NTOs) and at international level by the Competence Based Training in Intensive Care medicine program (CoBaTrICE, www.cobatrice.org) (1,2). Competence-based training (CBT) has been implemented in a variety of specialties including ICM and in several countries (United Kingdom, Switzerland, the Netherlands, Belgium and other European and non-European countries). A ‘competent’ doctor should have the ability to complete a task successfully and efficiently. CoBaTrICE was promoted in 2004 by the European Society of Intensive Care Medicine (ESICM) in the attempt to harmonize the training environment in ICM across Europe and outside Europe (1). CoBaTrICE listed factors needed to improve education in ICM and this included the necessary acquisition of skills, knowledge and attitudes, the learning environment, the examiners' training, the assessment frequency, location and methods (e.g., bedside assessment, case based discussion, etc.) (1-4).

Improving skills and related assessment methods

Traditional medical education has been criticized for its failure to ensure that all graduates are adequately prepared for independent work at the bedside. CBT derives from vocational education and it is therefore linked to real life. Unfortunately, the implementation of CBT has never been followed by international research to prove the benefit of this educational approach.

A Dutch survey done among ICM fellows emphasized the importance of non-technical skills (NTS) or soft skills in ICM training (5). This part of their training addressed human factors to prevent errors and enhance

communication in clinical practice through improvements in leadership, management, situational awareness and decision-making. Originating in the airline industry, NTS training has been already successfully introduced into anesthesia, surgery, emergency medicine and other acute medical specialties. ICM fellows indicated in this Dutch survey that NTS is important and in fact NTS is now included in several ICM curricula worldwide. This year, the ESICM Academy is launching a face to face course focused on the “Management of crisis in the intensive care unit (ICU)” using simulation to learn soft skills. Similarly, a new course on “Management and Leadership” has been developed. Leadership is emphasized in Advanced Life Support training and here, studies have shown favorable results when implemented (5). Education in soft skills has evolved due to a combination of new requisites for doctors (such as management and administrative duties), changes in the health care environment with a greater focus on quality improvement, patient safety and patient centered care as well as the global financial burden forcing doctors of the future to require a better understanding of cost control and rationalization of resource (5). Communication, professionalism, as well as negotiation and team working are all essential skills to the modern doctor (3,4). The challenge for these new educational skills is related to their assessment. Feedback and 360 degree evaluation have been introduced with the purpose of measuring soft skills. Simulation and role-playing have been increasingly used in the assessment of communication skills at the end of life or during organ donation challenges. Finally, reflective learning using patients' or family's oriented feedback have been introduced. However, these instruments have numerous limitations. These new soft skills are becoming crucial in medical training and are particularly important in stressful environments such as in the ICU.

Digital education in ICM

There are different theories on how adults learn (andragogy), but it is possible to have spontaneous and planned learning (6). In general, adult students have basic knowledge, skills and experience which could influence their learning in both positive and negative ways. Planned learning, such as courses or conferences, has the limitation of its costs and of the time needed to complete. Spontaneous learning can be achieved using role modelling, by immersion, by social interaction and social media. Advantages of spontaneous learning are that it happens all

the time and is directly linked to practice and to behaviour. The learning can be integrated in daily clinical practice with no extra costs, time or mental attention needed. Limitations of spontaneous learning are that it might be self-evident with minimal critical appraisal.

The sense of sharing knowledge and practice at the bedside using specialty centered social media has grown exponentially over the last decade but may have controversial benefits. It is objectively questionable how much the support offered by a community learning approach would mask a substantial superficial learning method and a too simplistic approach. In the mean-time, the power of knowledge translation by social media-based platforms (such as blogs and podcasts) continues to grow (7). Advantages in the use of digital based learning include fast dissemination and real-time information. A recent *Canadian Journal of Emergency Medicine* (CJEM) editorial reviewed how the Free Open Access Medical education (FOAM or #FOAMed) movement changed communication within Emergency Medicine Specialists and enhanced community feelings (8). Paradoxically, the increased speed of knowledge translation may raise concerns about knowledge entering practice before safety and efficacy can be established (8). Adult learners may be able to quote blogs and podcasts without demonstrating an understanding of the primary literature. Leaders in the online community could influence clinical practice. Post-publication reviews can identify errors, but these are often listed in the less-read comments sections (e.g., Twitter) which is easily missed by the learner. Challenges of digitalised education are related to quality control issues, rapid adoption of literature into clinical practice without the presence of a systematic rigorous peer review process (8). New ways for evaluating quality of these digital resources are emerging (e.g., ALiEM AIR series, AIR scores, MATRIQ, SMi) (9-12). Recently, digital resources such as “blogs” “webinars” “broadcasts” “platforms” have introduced a modified editorial and/or pre-release peer review to increase credibility (8). Unfortunately, these mechanisms are currently limited and do not sufficiently safeguard digital education against the propagation of bad science or even outright fraud (6,7).

Digitalised health care delivery to support information overload and prevent medical errors

Health care lags far behind other industries in the use of technology for education and clinical purposes. In 2015, 88% of adult UK population was using some sort

of technology and had a connection to internet. In the same period, only 2% of National Health System (NHS) institutions had digitally enabled transactions, appointments, individualised data and pre-planned activities (13). In 2013, the House of Commons Committee of Public Accounts, invested nearly £10 billion for the purpose of the National Programme for Information Technology (NPfIT). In 2016, KPMG and Nuffield Trust published a summary of the research done for the NHS on “*delivering the benefits of digital health care*”. The research highlighted that technologies that help clinicians to manage the exponential growth in medical information can improve the quality of patient care (1). These, so called, “decision support tools” (clinical decision support systems CDSSs, computerised physician order entry CPOE and e-prescribing technology) are crucial in improving patients’ outcome. Keeping up to date with the ever-growing body of medical research and new ideas around best practice is challenging. CDSSs can aid this process and range from very passive electronic aids, such as hyperlinks to guidelines, to extremely proactive one-click mechanisms. There is strong evidence that these tools can improve the quality of clinical decision-making (14-16) and some evidence they can lower cost (6,7). A recently published paper highlighted “*how health care is likely to change in the next 10 years*” (1):

- ❖ Patient outcomes will improve because technology intelligently supports long-term health management and short-term episodes of illness or injury;
- ❖ Clinicians will have access in real time to all the information they need;
- ❖ Clinical professionals and their organisations will be spending their time on their core competency—treating patients—rather than wasting time managing processes;
- ❖ Computing will be much more ubiquitous, but much less visible.

Conclusions

NTSs, leadership and management are vital skills needed for modern doctors practicing at any level of their training or career. The challenge relating to these soft skills is in their assessment and evaluation.

The digital revolution has impacted spreading of knowledge and clinical practice at the bedside but a more rigorous evaluation and appraisal of educational resources may be required. CDSS of the future, will not only aid in better clinical decision-making, but also may contribute to

better patient safety, greater adherence to guidelines, help doctors keep up to date and lower healthcare costs.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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