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REVIEW

Lessons that cross the surgical drapes

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KEYWORDS

Anaesthesia;
Training;
Surgery;
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Transfer

Abstract ***Background:*** Modern medicine has created a need for innovative methods of training that create safe, proficient specialists with adequate experience, and who are fit for purpose in this new system. Patient safety and patient-focused care are central to current practice and promoted by the use of simulation, human factors, team-based, multidisciplinary and interspecialty training. An acknowledgement that postgraduate training occurs within the work environment underlies the need to create systems that support learning within the workplace. Supervision, protected time for adequate induction and the opportunity to be involved in workplace learning are the key. It is also important that robust mechanisms to assure the quality of postgraduate education are in place.

Methods: Available reports were researched, and the particularities of anaesthetic training were outlined and summarised. Then, in a translational approach, we examined how to apply the lessons learned from anaesthesiological training to surgical training.

Results: The trend towards reducing the working hours of junior doctors, whilst still providing excellent training, creates a need for innovative, efficient, concentrated training programmes, where trainers and trainees are engaged in a seamless, constant educational endeavour.

Conclusion: Within this review we offer the system of anaesthetic training in the UK, and some of its recent changes, as a template to highlight themes in postgraduate education that exemplify this innovation and are transferable not only to surgery but across different specialties.
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Introduction

The advent of modern medicine has created an ongoing partnership between surgical and anaesthetic specialties within the workplace. This has been reinforced by the

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current practice of the WHO Safer Surgery checklist [1]. However, despite these specialties working closely together in the theatre suite, there is a perception that training, and the subsequent satisfaction of trainees in the respective specialties, are markedly different. A recent survey noted that trainee satisfaction within anaesthetic and surgical posts was 85% and 77%, respectively [2].

The pressures on training are constantly developing, with recent trends towards reducing the working hours of junior doctors, whilst still producing safe, proficient specialists with adequate experience who are fit for purpose. This has led to a need for efficient, concentrated training programmes where trainers and trainees are both actively involved in a seamless and constant educational endeavour, but with patient safety as the cornerstone.

Postgraduate training for all specialties occurs in the workplace. Traditionally, anaesthetic training focused on gaining a trio of 'knowledge, skills and attitude' through a time-based quasi-apprenticeship model. Within the last 10 years this model has changed to a competency-based programme, that more recently includes the concept of 'spiralling' modular training at different points of the programme [3]. The greatest changes in training are easily identifiable, from how trainees acquire the appropriate 'skills and attitude' through newer techniques such as simulation and regular assessment in the workplace; however, there has also been an increased understanding of the importance of non-clinical knowledge.

In this review we offer a perspective on anaesthetic training in the UK, highlighting specific themes that might be of interest and applicable to surgical training.

Unique aspects of anaesthesia

A unique feature of the specialty of anaesthesia is its role of working with other specialties. The overt knowledge and awareness that an anaesthetic is administered solely to allow a separate procedure to occur, cements early on the need for teamwork. Furthermore, the ability to provide high level anaesthesia requires an understanding and anticipation of how critical steps within a surgical procedure will affect a patient's physiology and thus the type of anaesthesia delivered Thus anaesthetists are trained to take an encompassing overview of the patient in the peri-operative period, simultaneously allowing for the effects of the surgery whilst balancing the risks of the anaesthesia. Airway surgery, with the difficult 'shared airway', is often cited as an area where both surgeons and anaesthetists strive to achieve and maintain an understanding of their opposite numbers' agendas and actions. However, it is arguable that this level of inter-specialty interaction should be the norm within all specialties.

A second feature that is central to anaesthesia and its training is the management of risk and the ability to deal with the unexpected. It is recognised that creating a state where there is a reversible lack of awareness in an environment with a range of equipment and electronic devices, several healthcare professionals, for a surgical procedure that will itself have consequences, is a highly dynamic and complex situation. Vigilance is required to ensure that the patient is kept safe at all times. Training focuses on identifying these risks, explicating both common and rare risks, and practicing established protocols to deal with these emergencies.

A system of learning

Creating familiar environments

All postgraduate training programmes in the UK involve the rotation of trainees to several hospitals. The frequency of these rotations can vary from yearly to a period as short as every 3 months. Thorough induction programmes familiarising trainees to their new workplace are recognised as essential for patient safety, but are also required to discuss the trainees' roles, responsibilities and educational objectives. In common with all workplaces, the ability for a new starter to be introduced to and rapidly gain familiarity with the normal daily practice, protocols, processes and guidelines within a department is the key, increases job satisfaction and is a standard of quality [4]. Much of the work undertaken by anaesthetic trainees uses medical equipment or occurs through the administration of medications. Thus trainees are expected to take responsibility for being familiar with and knowing the location of specific equipment, such as the anaesthetic machine, difficult-airway trolley, defibrillator or resuscitation trolley, and medications such as dantrolene and intralipid that might be needed in emergency situations.

Supervision

Supervision is a prerequisite for good-quality training. Previous work [5] showed the importance of adequate supervision within the process of learning or mastery, and to maintain patient safety. Within the postgraduate education system in the UK, this supervision is divided into two areas, i.e., clinical supervision and educational supervision.

The former refers to supervision whilst working in the clinical environment, whereby trainees are supported to learn whilst working. In anaesthetics, the clinical supervision experienced by a trainee is typically delivered by a group of people that includes consultants and more senior/experienced trainees. Supervisors should be easily accessible, prepared to teach, trained to have developmental conversations and give feedback, and deal rapidly with clinical issues as they arise. Clinical supervision needs to be tailored to the experience and ability of each trainee, as it is only through this scaffolding of

supervision that trainees can progress safely. This one-to-one teaching is the norm for anaesthetic training. A curriculum that mandates a period of complete supervision for the beginner anaesthetist until an initial assessment of competency is completed, typically 3–6 months, and organisation of theatre schedules that routinely place anaesthetic trainees within their first 2 years of training with consultants, both maximise training time and training opportunities to which junior anaesthetists are exposed. There is evidence that, despite an overall decrease in working hours for anaesthetic trainees, supervised training has been maintained or increased [6]. A single trainee will meet many clinical supervisors within a single rotation, which provides a diversity of experience and perspective. This highlights the importance of maintaining a good educational culture within a department.

Educational supervisors fulfil a more holistic role. They remain a focal point for their trainee, ensuring that they make adequate clinical and educational development, appraising their educational progress by setting out a learning or training agreement, designating specific educational responsibilities, using a learning portfolio, and they offer pastoral care. Having clinical supervisors as well as a named educational supervisor allows the triangulation of accurate feedback to trainees, with feedback being derived from several sources. Clinical and educational supervisors should be adequately trained for the roles that they undertake and within the UK there is national guidance for their accreditation [7]. In some regions educational supervisors are required to demonstrate their competence in several domains, such as teaching and learning, workplace-based assessment, appraisal, equality and diversity, and career advice [8].

Workplace learning

The competency-based system of education in the UK has been coupled with the need to show demonstrable proof that these competencies have been achieved. This has led to the adoption of a variety of tools for workplace-based assessments, such as 'multisource feedback', 'directly observed procedures', 'case-based discussions' and 'mini-clinical evaluation exercises'. These tools are common to surgery and anaesthesia. Whilst some describe a degree of ambivalence towards workplace-based assessments, and the evidence surrounding their impact on performance is mixed [9], their use formalises the supervisory relationship and they can be used to drive learning [10]. It should also encourage self-directed learning. Their use and the introduction of electronic portfolios form part of the way that educational activities can be streamlined.

A separate strand of workplace learning centres on participating in an organisation with a learning culture. Organisational learning refers to departments that create opportunities to systematically examine their own practice and have processes that allow the system to change. Within anaesthetic departments, in situ learning and training include encouragement and attendance of journal clubs, 'morbidity and mortality' meetings, and engagement in critical incident reporting and departmental risk management.

Quality in education

Assuring quality within postgraduate medical education and having a robust system to set and monitor quality is vital to ensure excellence in training and maintain professional standards. Within the UK, the General Medical Council has this role. They conduct a yearly survey, seeking information from trainees of all specialties about their overall satisfaction with their training, the quality of teaching and clinical supervision, and clinical experience gained [2]. The remit of the General Medical Council has four core areas, i.e., approval against set standards, sharing evidence such as the national survey results, quality visits, and a system of responding to concerns [11]. In practice, there is a complex system that occurs at a national, regional and departmental level that guarantees educational quality. For anaesthetic trainees, curricula and standards are set by the Royal College of Anaesthetists. Regional 'local education and training boards' monitor quality through a series of visits to individual institutions, whilst individual institutions are responsible for the ensuring that their training meets national standards. Within anaesthetic departments, an openness to change, coupled with frequent formal and informal trainee feedback systems, forms part of this quality control.

Emergencies: simulation, teamwork and human factors

The risky, dynamic nature of anaesthetics has already been discussed and there is an awareness that anaesthetic training must address this. The ways in which anaesthetists and the teams in which they work seek to learn and improve have recently changed to focus on human interactions or non-technical skills rather than scientific knowledge.

Comparisons are made between healthcare and other high-risk industries, and it is from aviation that anaesthetics and other health professionals take their cue. For anaesthetics in the UK the series of events in 2005, where a 37-year-old women (Elaine Bromiley) died after an unexpected airway emergency during an elective case, is pivotal. In the aftermath of his wife's death Mr. Martin Bromiley, an airline pilot, expected that it would be investigated in a similar manner to that of an aviation accident, where technical and human factor causes are routinely sought. Mr. Bromiley's efforts, which through an independent inquiry showed several human-factor failings in his wife's case, and the subsequent establishment of the first Clinical Human Factors

Group, has brought the importance of human factors very much to the forefront in anaesthetic training.

In particular, human factors are now applied to processes where drills, checklists and standard operating procedures enable behaviours to be predictable, and briefings outline a series of potential options and shared mental rehearsal for these options. Within this framework, the importance of teamwork cannot be denied, and there is evidence that improvements in team processes are associated with improved clinical outcomes [12].

Simulation training is available across anaesthetic and surgical specialties, and allows for the acquisition of both technical and non-technical skills in a safe environment [13]. The use of simulation training has become increasingly common in anaesthetic training and offers specific advantages over learning in the clinical environment. Crises and rare emergencies that can arise in clinical practice can be easily simulated in a controlled arena. Furthermore, non-technical skills or human factors such as leadership, communication and decision-making can be addressed and learnt. High-fidelity simulation coupled with video replay allows a degree of objectivity about performance within scenarios [14]. Also, the culture of feedback and training to debrief or give feedback is directly translatable from the world of simulation to everyday practice.

From anaesthetics to surgery?

Within this review we have identified anaesthetic training as having several characteristics. Some, such as the constant need to balance risks, could be considered as particular to the specialty, but many others, i.e., a quality-assured educational system that allow time for adequate induction, supervision and learning, are applicable across all specialties. We have described one educational system that might not fit in different healthcare systems, or indeed every surgical specialty. However, the principles of this system are eminently transferable and, we would contend for surgical specialties within Europe, very achievable.

It is important to acknowledge the differences between anaesthetic and surgical specialties. Unlike anaesthetics, where activities are fixed to one or two locations, the surgical workload is often split between many arenas, e.g., ward-based care and ward rounds, outpatient clinics and the emergency department, as well as operating in theatre. This division can disadvantage the surgical trainee, where early in their training much of the focus of their work is outside the theatre environment. Similarly, individual surgical teams are much smaller than in anaesthetic departments. A large pool of consultant trainers creates the necessary flexibility to allow for protected educational time without undesirable effects on the daily clinical work.

Despite this, we suggest that the importance of creating time for education is vital, promoting trainee satisfaction and patient safety. Whilst skill-based simulation is more advanced within surgery than in training in anaesthesia, crises in theatre involve several health personnel. Training for such scenarios lends itself readily to team-based high-fidelity simulation training, and combined multidisciplinary and interprofessional training can only lead to an improvement in working relationships and outcomes.

Conclusion

Throughout this review we sought to describe the foundations that create excellence in postgraduate training. For training in anaesthetics, these foundations have maintained high-quality training despite an overall decrease in training time. Irrespective of specialty, excellence in training is created by a quality-assured educational programme that allows appropriate clinical supervision, time for induction, inclusion of the trainee within departmental learning (such as morbidity and mortality meetings) and a good balance of experiential and educational opportunities.

We acknowledge that there are some aspects of anaesthetic training, i.e., an early and constant exposure to the need to mitigate, risk and the requirement to understand the actions of other specialties, which are particular to anaesthetics. However, a mutual appreciation from both surgical and anaesthetic specialties of the actions and subsequent risks created by the actions of their opposite number would lead to better patient care and increased patient safety. Looking to the future, this could occur at different levels. For example, the routine incorporation of an anaesthetic rotation within surgical training programmes, allows surgeons to gain anaesthetic experience. The current practice of anaesthetists attending preoperative multidisciplinary meetings could also be extended a step further, by conducting joint surgical and anaesthetic specialty meetings and conferences. Team-based high-fidelity simulation, targeting not only anaesthetists and surgeons but also theatre staff, would illuminate the various difficulties and agendas that surround incidents in theatre, and create improved, safer protocols and mechanisms to cope with emergencies.

Surgeons and anaesthetists are clinically co-dependent and in clinical practice do not function in parallel. It is now time to extend that partnership to education and promote joint education and training opportunities to enable lessons to truly ‘cross the surgical drapes’.

Conflict of interest

None.

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