Simulation in Surgical Training

A statement from

The Association of Surgeons in Training

www.asit.org

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1. Introduction

1.1. Simulation in Surgical Training has gained much interest in recent years. This statement by the Association of Surgeons in Training (ASiT) discusses the potential for the integration of simulation into various facets of surgical practice.

1.2. ASiT is an educational charity supporting the professional development of surgeons in training. Our association represents UK trainees from all nine surgical specialities and is one of the largest surgical professional groups with over 2,000 members.

1.3. This document discusses the role of simulation in both recruitment and the on-going training of both core and speciality surgical trainees. We acknowledge simulation may also have roles in revalidation of licensed doctors although this falls outside of our remit.

1.4. This review reflects attitudes and considerations from ASiT representations at a number of events including May 2011's Royal College of Surgeons of Edinburgh (RCSEd) simulation training day and recent ASiT surveys. Its contents have been ratified by the members of the ASiT Council.

1.5. The Joint Committee on Surgical Training (JCST)has agreed to integrate simulation into the Intercollegiate Surgical Curriculum Project (ISCP). A subcommittee on the JCST panel on simulation in surgical training is overseeing this process and therefore this statement is timely.

1.6. We hope this statement will aid discussions on trainee perspectives in the future role of simulated surgical practice with the JCST, Colleges and other stake holding training organisations.

2. Simulated Surgical Practice

2.1. Simulated practice encompasses any activity which aims to imitate a system or environment with the aim of assessing, informing and modifying behaviour.

2.2. In recent years direct comparisons have been drawn between the management of risk in the aviation industry and in surgical practice. The safety culture promoted by the airline industry, the environment that encourages the reporting and analysis of errors and the continued use of simulated training have made for many effective collaborations and cross-over of information and techniques.

2.3. Whilst similarities between the aviation industry and surgery exist, especially in the study of human factors in risk management, care must be taken to sensibly apply tailored solutions, specific and relevant to surgical practice. Lessons from other professions including the armed forces and fire brigade which depend upon intensive simulation training prior to real exposure may benefit surgical training.

2.4. The multitude of research articles on simulation in surgical selection and training and a recent Cochrane review(1)highlight the interest and wide application of simulated methods that can be utilised. A systematic review (2) identified over 30 randomised controlled trials looking at surgical simulation.

2.5. Simulation in surgical practice includes both operative and non-operative models and may incorporate multi-speciality and multi-disciplinary scenarios. Current examples include the EMERGO / MAJAX major incident training days.

2.6. Operatively, simulation may occur in many locations including: dedicated wet or dry labs in specialist simulation laboratories, within working theatres and even in the trainee's home either using cheap, basic jigs, or increasingly sophisticated computer equipment.

2.7. Non-technical simulation may receive less recognition but as non-technical skills are increasingly assessed in surgical practice this is likely to reflect an area of development. The aviation industry recognises that over 80% of errors occur due to human factors.(3) Increasing patient safety through simulation in non-technical skills will become crucial.

3. The need for simulation in surgical practice

3.1. European Working Time Regulations (EWTR) and New Deal have significantly reduced the clinical exposure of surgical trainees.(4) Surgery, as an experience dependent craft speciality is affected more than other medical specialities. There is a need for exposure to a wide range of procedures for a trainee to gain the competencies required to operate safely and independently.Reduced hours have a significant impact on the amount of time a surgeon in training can spend in the operating theatre prior to their Certificate of Completion of Training (CCT). The need to attain specific operative competencies within a restricted and curtailed training period leaves trainees needing to seek out novel and innovative methods to ensure the adequacy of their training.

3.2. Trainees want to maximise all training opportunities in the clinical setting and having pre-developed basic skills acquired on a simulator can facilitate this.It is becoming apparent that self-directed simulation training away from patients may be an alternative to compensate for reduced time under direct supervision.

3.3. Recent efforts to emphasise the crucial role of the surgical trainer seek to redress the realisation that this function is often undervalued and forgotten. Training requires dedicated and motivated trainers to succeed. However, time allowed for training in consultant job plans is often poorly recognised. ASiT has long commended excellence in surgical training with the Chief Medical Officer awarded Silver Scalpel Award. The concept of better recognising and rewarding excellence in training has recently been embraced by the RCSEd with the much needed introduction of the faculty of surgical trainers.

3.4. The wellbeing of the patient is paramount in all clinical encounters, both to trainers and trainees. Trainees do not want to be immersed in a situation in which they feel their training has not been adequate for a given task and where patients may ultimately suffer. Therefore, preparedness for clinical scenarios gained through simulation can be beneficial to trainees' confidence, wellbeing and ultimately the safety of patients.

3.5. A recent Cochrane review has supported simulation as a supplement to surgical training and there is a rising evidence base for various successful simulation models.(1)

3.6. Trainees are positive about the benefits of simulation and have been shown in several programmes to value the skill acquisition from simulation training. Trainees are keen to emphasise that simulation is only an adjunct to and not a replacement for clinical operative training.(5,6)

3.7. Simulated surgical practice is a reality for contemporary surgical trainees. ASiT endorses the opinion that high quality simulation must be part of future surgical training.

4. Simulation: Role in Training

4.1. Simulation will be included in the ISCP curriculum from 2012 and there will be a phased integration into all surgical training programmes.

4.2. ASiT endorses simulation as a supplement to clinical surgical training as part of a balanced curriculum. We emphasize our support lies with its role as an adjunct and not a substitute for effective clinical education. This sentiment echoes the findings of a review of the literature on the subject.(2)

4.3. Simulated practice occurs not just in surgery but is often a component of undergraduate practice and Foundation training. Therefore, future cohorts of surgical trainees will be consistently exposed to simulated practice throughout all phases of their medical training from medical school, the Foundation Programme, core and speciality training.

4.4. Flattening the learning curve of complex tasks is an obvious benefit for trainees and patients. This has shown to be the case with the use of certain simulation models.(7)

4.5. Simulation of, and hence preparation for the “case of a lifetime”, akin to pilots being tested during freak weather conditions is another clear benefit that trainees may not otherwise encounter during their professional practice.

4.6. Ready day-to-day access to simulation facilities in a central location in the hospital can also optimise the efficiency of surgical training by allowing surgeons in training to utilise even small periods of downtime during the working day by undertaking simulated operations.

4.7. Business models suggest it is financially beneficial for NHS Trusts to invest in provision of simulation, reducing the time needed to train surgeons intra-operatively on real patients. This is in addition to reducing the likelihood of complications due to improved standards of operating.

4.8. The details of the proposals by the JCST regarding integration of simulation into the ISCP curriculum will be of great interest to trainees. We urge trainee participation through ASiT in the planning and review process during this period.

5. Simulation: Role in Selection

5.1. Selection to surgical specialities already incorporates tests of basic dexterity and procedural skills. This has been carefully monitored and is an understandable pre-requisite to acceptance to surgical practice which often requires these aptitudes. Precedence for this can be seen from the work done at the Royal College of Surgeons of Ireland.(8)

5.2. Concern regarding the type of simulated exercise required has been a source of some debate. The task must be equitable, valid and repeatable to be an effective selection tool.

5.3. It is crucial that the potential of an individual is measured as opposed to a simple snapshot of their current level of skill. Their prior experience, level of training and access to facilities should be considered as mitigating factors. The experienced trainee performing a task based upon years of clinical experience is not comparable to someone with no clinical experience but clear potential to acquire these skills.

5.4. The level of competence which is designated as the differentiation point between acceptable and poor performance is also open to criticism. It is recognised some experienced surgeons may rate badly on simulated criteria for which they have effectively practised for many years.

6. Simulation: Role in Assessment

6.1. The role of simulation in assessment of trainees has caused controversy.

6.2. Primarily this is due to the fear that it may restrict clinical training. Some schools of surgery require effective demonstration of an operative procedure on simulated patients prior to being allowed clinical exposure. ASiT acknowledges potential patient safety concerns if this task were to be completed unsupervised but stresses there is evidence that supervised clinical operative training does not adversely affect patient outcomes.(9)

6.3. Attainment of the MRCS and FRCS requires completion of simulated non-technical clinical scenarios. This is now well established. Introducing summative or high-stakes operative simulation in this context (particularly for FRCS/ CCT) is debatable. Presently, operative competency is judged on a trainee's logbook and their validated workplace based assessments. ASiT is of the opinion that the currently available simulators do not have the technical sophistication required to realistically simulate the operative complexity of what is required for CCT.

6.4. It is important to determine whether single tasks (e.g. suturing), parts of complex tasks (e.g. completing an anastomosis) or a full task (a laparoscopic cholecystectomy or ORIF) are used as part of on-going *simulation based assessments* (SBAs), in a similar manner to which PBAs and CEXs are currently undertaken. Some specialties already incorporate simulated operative procedures as part of their FRCS examination assessments.

7. Pitfalls and Concerns

7.1. A recent ASiT snapshot survey highlighted gross disparities that trainees feel may affect their ability to complete simulation training as part of their curriculum. For example, the absence of simulation facilities, restricted access through locality and poor quality may limit their benefit.From discussion with trainers, it is apparent that they themselves may not be aware of the extent of their own facilities or may falsely believe these meet appropriate standards.

7.2. Trainees want access to high quality simulation facilities as part of a co-ordinated coherent structure instead of isolated, unfocussed facilities. Models for optimising the value of a simulated facility have been proposed. These include incorporation of multi-disciplinary, multi-speciality facilities on the same site with easy access from clinical areas and open access to simulation training equipment.

7.3. Current financial restraints will limit many institutions abilities to acquire high quality simulation models. However, it is financially beneficial for hospitals to make these initial outlays as an investment in the future of the NHS on ashort and long-term basis.

7.4. The recent ASiT “Cost of surgical training survey” highlighted the rising financial hardships for surgical trainees. ASiT does not endorse the part allocation of dedicated study leave funds towards the provision of simulation facilities. We therefore would express concerns on any programme which may transfer additional costs onto the trainee.

7.5. Industry currently plays a leading role in developing commercially available simulation programmes. The role of industrial sponsors in future simulation based training needs to be considered as they may be an important potential contributor of experience, resources and funding.

7.6. There have been acknowledged variances in work based assessment (WBA) requirements for specialty trainees and variable application of a simulation curriculum could lead to further disparities between training programmes. Ensuring a co-ordinated UK wide approach is therefore mandatory.

7.7. Frequently, simulation facilities only cater to one speciality and it is imperative all surgical disciplines have equitable access to appropriate resources.

7.8. It is recognised that on-going research is required to both refine existing simulation tools, and also to facilitate the development of the next generation of simulators.We urge training authorities to consider this prior to instituting curriculum changes which may not be achievable in many Deaneries/ Schools of Surgery.

7.9. A common concern among trainers relates to a sentiment that trainees do not use existing facilities sufficiently to justify further expenditure. Where simulation facilities exist and their availability is advertised to trainees, uptake and utilisation has been shown to be variable. ASiT acknowledges that apathetic trainees exist but feel that often infrequent use relates to location, quality and accessibility. Trainees may not appreciate the existence of facilities or they may not have been supported by appropriate tuition in their use, with this leading to further poor utilisation of current facilities. Methods to improve uptake include more frequent allocation of dedicated training and practice sessions, and improving accessibility to such facilities, for instance by planning their placement to be in a central part of the hospital, such as on the operating corridor, and removing restrictions that prevent their use outside of standard working hours.

7.10. Identified programme leads (such as the Trust's director of surgical education) should take an active role to ensure that trainees and

trainers engage with provided resources. Assessment tools already exist and more require development to demonstrate uptake and progress with use of such facilities.

8. Recommendations

8.1. ASiT proposes that simulation become integrated into the curriculum to supplement clinical training, not replace it.

8.2. Structured simulation training should be integrated into programmes to reflect the requirements in the ISCP curriculum.

8.3. There must beimproved accessibility,awareness and high standards of local facilities to permit trainees and trainers to fully utilise these valuable resources.

8.4. ASiT welcomes further discussionand exploration to allow affordable and accessible means of surgical simulation to individual trusts and schools. ASiT does not believe this should be drawn from existing study leave budgets.

8.5. There must be a greater focus on developing simulated models for all surgical disciplines

8.6. The role of simulation training in non-technical skills should not be underestimated or ignored.

8.7. A national commitment from the Department of Health, NHS and Royal Colleges is essential to ensure continued development of surgical simulation facilities.

8.8. ASiT believes a unified national accreditation of approved courses and facilities is essential to maintain national standards and welcomes initiatives by the JCST and Royal Colleges to lead on this issue.

8.9. A number of associations already exist (e.g. The Association of Simulated Practice in Healthcare) to promote multi-disciplinary involvement and research. These should be supported.

8.10. ASiT believes trainee participation in the planned addition of simulation to the curriculum is essential and feels thatas the only pan-surgical society for surgeons in training, ASiT is ideally placed to be a key stakeholder for provision of this support.

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9. Further Reading

9.1. ASiT has published a number of statements which are available at http://www.asit.org/resources/articles

9.2. These include our position statements:

- Cost of surgical training (April 2011)
- Future of Surgical Training (August 2010)
- EWTD for Surgical Trainees (August 2009)