Opportunities for learning in the surgical workplace and how they can be exploited: a practical guide

Training times and the working week have been shortened but the amount needed to be learned remains the same. This article demonstrates how trainees in surgery can incorporate learning opportunities into their normal working day.

Surgical specialties face a steep challenge in maximizing learning in the workplace because of shorter working hours and length of training (Benes, 2006). This craft specialty has previously adopted an apprenticeship style of learning, often taking many years to complete (Hamdorf and Hall, 2000). The introduction of time-capped training (Department of Health, 1993) and a 48-hour week as a result of the European Working Time Directive (Simpson et al, 2011) has reduced hours of training, yet the apprenticeship model is still widely used. Surgical training must be modernized in order to maintain standards and produce adequately experienced future consultants. It is the duty of trainees, as future trainers, to exploit every opportunity for learning in order to safeguard the specialty. This article will discuss strategies to maximize learning opportunities and suggest a more effective learning environment.

Enhancing the educational opportunities in the workplace

Multiple environments are available to train surgeons: operating theatres, outpatient clinics, on-calls and ward-based learning. The educational value of each environment must be maximized, producing a coherent and systematic programme of training that is adaptable to the individual needs of each trainee.

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Gofton and Regehr (2006) stated that the task is:

'...to train a multi-faceted well-rounded professional using multiple contexts in a complicated (and not always education-friendly) healthcare climate. We must not only maximize the number of learning opportunities, but also the potential of those learning opportunities.'

There are various methods of achieving this. *Table 1* lists activities available on the 'shop floor' which can be used by trainees for their educational benefit.

The operating theatre

Education in the operating room is considered the centrepiece of learning for surgical trainees: development of teaching and learning strategies in this environment is critical. The Operating Room Educational Environment Measure has been used to improve the learning experiences of trainees in the operating theatre (Kanashiro et al, 2006). Through interviews with trainees and trainers, the major elements contributing to the educational environment in theatre were identified. It is well recognized that positive learning environments influence positive educational outcomes: academic achievement can be linked to student perceptions of the educational environment.

Good communication in the operating theatre fosters learning; in fact trainer–trainee communication is imperative. There are three important teacher-related factors which lead to successful operative surgical teaching: having a clear instruc-

Table 1. Methods of exploiting training opportunities in the workplace

Learning opportunity	Methods of maximizing learning
Operating theatre	Preparatory reading
	Briefing and debriefing
	Regular assessment: direct observation of procedural skills, procedural-based assessment
	Web-based material
	Recording of procedures
	Simulation
Outpatient clinic	Preparatory reading
	'Hot seating'
	Regular assessment: clinical evaluation exercise or case-based discussion
Ward round	Discussion of management plans
	Observation of trainee's examination skills
Educational supervision and mentoring	Discover learning styles of trainee
	Regular objective setting and review
	Workplace-based assessments
Administration	Review of trainee's clinic letters, generating feedback and also opportunity for case-based discussion

tional plan, facilitating surgical independence and showing support (Vikis et al, 2008). Ineffective experiences are those where teachers take away cases as an alternative to explaining to the trainee what he/she should be doing. Having instruments taken from one's hands, thereby changing the trainee from surgeon to assistant, can be a disheartening and demoralizing experience.

Trainees also have a part to play. They should be open to criticism, show interest, and recognize their own limitations. They should come to theatre ready to learn, rather than attend a theatre session expecting to be 'taught' (*Figure 1*).

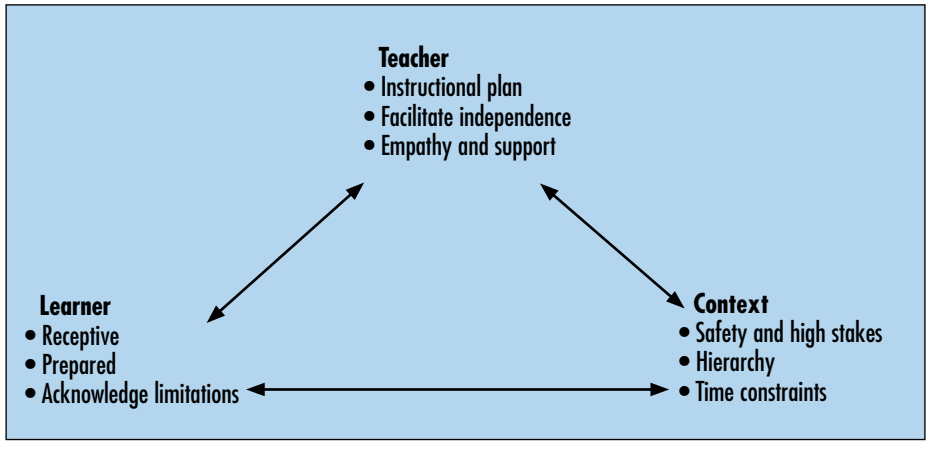
Background reading has traditionally been the method by which trainees prepare for forthcoming theatre cases. If trainees are aware of the operations taking place on the operating list, they should read the relevant anatomy, pathology and operative textbooks in advance in order to prepare themselves. In the past, when trainees were fortunate enough to be exposed to the same procedure on multiple occasions, this was perhaps not so crucial. With time-limited training it is imperative that trainees make the most of each operative encounter. They cannot expect to be taught everything that they need to know within the theatre environment, as time pressures will not allow this, nor will the patience of their trainer. They need prior understanding of how a procedure is carried out before being allowed to attempt it themselves.

With the advent of online resources, trainees can now watch operations online performed by experts (www.websurg.com), accompanied by a step-by-step guide to the procedure (www.wikisurgery.com). These websites can be used before theatre sessions as learning resources and after them to consolidate knowledge. Trainees could also watch this material alongside their trainer, pausing footage so the trainer can demonstrate and explain particular points.

Briefing and debriefing procedures have come into the spotlight from a patient safety and efficiency perspective (Paull et al, 2009). However, they can also be used to maximize trainees' learning. Theatre sessions can begin with a 'briefing', where learning needs are established and session objectives identified. The trainee can outline his/her operative strategy for each case. Allowing trainees to become involved in objective setting permits them to better identify areas in which development is needed and translate this into practice (Roberts et al, 2009). 'Debriefing' should focus on reflection of objectives set at the beginning of the session, reinforcement of good performance, and suggestion of areas for further development.

The incorporation of cameras into operating lights or use of laparoscopic equipment offers the opportunity to record operations for assessment, trainee–trainer discussion and trainee self-review (Driscoll et al, 2008). This improves the acquisition of technical skills and self-assessment. The trainee acquires a permanent record of his/her performance, which can be compared to future recordings of the same procedure and also to the performance of an 'expert' in order to facilitate learning. Recording procedures in this indirect way may be less stressful for the trainee than undergoing formal assessment by a trainer during the procedure itself.

Figure 1. Trainer, trainee and context of training. Adapted from Vikis et al (2008).



Many surgeons do not support the introduction of simulation into surgical training. They consider that it cannot replace live surgery, which provides emotional and technical stresses that cannot be reproduced in an artificial environment (Meterissian et al, 2007). However, simulation may prove a useful adjunct to operative experience in providing opportunities to practice technical skills. Simulators have been used to teach a variety of surgical skills, ranging from knot tying to laparoscopic techniques. Although simulation is well established in surgical teaching, there is a lack of evidence supporting its use in assessment. Performance of the trainee on the simulator should improve with trainee experience: this has not yet been shown to be the case (Paisley et al, 2001).

Other problems encountered with simulation include the number and range of experiences available per trainee, competition with other educational activities and realism (Fernandez et al, 2010). Furthermore there is debate as to whether 'virtual' skills are translatable to the real world. Whether or not this is the case, simulation can be used as an effective self-directed learning tool. Repeated practice of technical skills in a learner-centred environment, free from the anxieties of patient care, can augment operating theatre performance and improve confidence of trainees (Anastakis et al, 2003).

Outpatient clinics and ward rounds

It is not just operative training that trainee surgeons will lose as a result of a reduction in their working hours. Exposure to on-calls, ward rounds and outpatient clinics will also decrease. Opportunities during each of these activities must therefore also be enhanced.

Outpatient clinics can be viewed by many as service-provision exercises rather than training opportunities. Trainees may assess patients and instigate management plans without consulting their trainer; their practice thereby goes unregulated. Assessing patients, formulating diagnoses and instituting management plans are essential skills for a surgeon. Regular teaching and feedback during clinics should improve their clinical skills and facilitate preparation for examinations. Discussion of cases with seniors can reduce

the number of superfluous tests ordered and unnecessary follow-up appointments made by improving decision-making skills (Taffinder, 1999).

'Hot seating' allows the trainee and trainer to exchange roles during the clinic: the trainee can observe the trainer's interaction with a patient, and during the next clinical encounter the trainer observes the trainee. Role reversal can occur according to the complexity of the patient problem and/or the trainee's objectives. This direct observation of trainee performance provides the opportunity for immediate feedback (Beard, 2008). Trainee satisfaction with this method is high although its implementation may be tricky. Hot seating requires time and effort, and results in reduced patient throughput – something which may concern managerial colleagues. Hot seating may therefore be used on a monthly basis so that it does not impact greatly upon the number of patients seen in clinic.

Ward rounds can be used to develop skills in the formulation of management plans and clinical decision making (Taffinder, 1999). A study by Bhangu and Hartshorne (2011) showed that the post-take ward round presents an important learning opportunity, as diagnoses and management plans are changed by the consultant in a significant proportion of cases. Where it is usually a senior member of the surgical team such as the registrar who leads the ward round, if a more junior member leads the ward round for part of it and presents cases directly to consultants, it provides a safe environment in which they can make mistakes without harming patients. Feedback can be given on their performance by other members of the team (Monkhouse, 2010).

Workplace-based assessments

Workplace-based assessments have been introduced in recent years to demonstrate competence and are now a core method of assessing trainees. They are also a useful learning tool. The main aims of workplace-based assessments are to aid learning through objective feedback and to provide evidence that the competencies required to progress to the next level of training have been achieved (Beard, 2008).

Observing trainees during their daily practice is a time-efficient way of determining their level of competence. There are many methods including procedure-based assessments, direct observation of procedural skills, mini-clinical evaluation exercises and case-based discussions. Multisource feedback can lead to performance improvement (Miller and Archer, 2010). By giving great importance to the concept of feedback, trainees are encouraged to reflect upon the learning experience and can therefore improve their skills (Saedon et al, 2010).

Debriefing is also an ideal time for completion of procedural-based assessments or direct observation of procedural skills – mandatory requirements for all surgical trainees. These assessments are computer-based, and are completed by trainee and trainer together. When used effectively, workplace-based assessments provide the trainee with information concerning his/her performance, and repeated assessment of the same skills over time can demonstrate progression. The assessments can identify strengths, skills requiring development and action plans can be formulated to aid learning. Their success not only depends on the diligence of trainee and trainer to complete them regularly, but also on the quality of the assessment tools themselves (Regehr et al, 1998).

Educational supervision

Effective supervision coupled with a good quality relationship between trainee and supervisor is extremely important (Kilminster, 2000). Supervision helps address learning needs and assists in planning training (Kurtz et al, 1998). It is naïve to consider pure self-guided learning as a comprehensive way of addressing unconscious areas of incompetence.

A dedicated supervisor provides a forum for open reflection and discussion, one of the defining characteristics of professional practice. Schön (1983) suggested that the capacity to reflect on action leads to engagement in a process of continuous learning.

As each supervisor is responsible for multiple trainees with varying degrees of knowledge and experience, training on curriculum and assessment is essential, so accurate learning needs can be agreed. This forms part of a comprehensive learning contract which helps create a learning infrastructure and acts as a process of coherent communication between supervisor, programme director and trainee (Wood, 1971).

Mentoring

Mentoring is seen by many as a crucial step in achieving career success (Roche, 1979). In contrast to the nursing and midwifery professions, where mentoring programmes are well established, medical training does not regularly use this valuable resource to focus on the broader development and personal growth of the trainee (Macafee, 2008). One of the main functions of mentoring is to provide role modelling. Mentees also look to mentors for inspiration, feedback and confidence. Mentoring can motivate the trainee to learn and reach his/her full potential.

The problems associated with providing mentoring are mainly of time and money. The trainer is currently the teacher, supervisor and assessor: asking him/her to provide mentorship as well as assessing trainees' skills and fitness to practice is probably a step too far. Additionally, mentoring should be separate from assessment, performance review and evaluation, and therefore assessors should not mentor the same trainee. 'Trainees did fine without mentors in the past, why do we need them?' say sceptical surgeons across the country. Training, society and the medical profession have changed considerably since traditional surgical teaching moulds were created. The role of the mentor is therefore becoming increasingly important to help integrate and contextualize training (Gofton and Regehr, 2006).

Administration

We must not forget that even letter dictation and similar administrative tasks can be used as an opportunity to hone one's written communication skills by providing important information in a succinct manner. In particular, letters should be well structured to allow medical staff to address essential information and also for ease of data gathering (Hook et al, 2006). This provides another opportunity to give feedback to trainees on the assessment and management of patients.

Conclusions

Most clinical teaching takes place in the context of busy practice, with time at a premium. Both trainer and trainee must

use their time efficiently and effectively. The surgeons of the future must not only be technically skilled, they must also be effective communicators and compassionate, and be dedicated to advancing the specialty in terms of skills and knowledge. It is up to the trainee and trainer to decide how best to maximize training opportunities. This should be done on an individual basis, incorporating individual learning styles (Gofton and Regehr, 2006). BJHM

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Anastakis DJ, Wanzel KR, Brown MH (2003) Evaluating the effectiveness of a 2-year curriculum in a surgical skills center. *Am J Surg* **185:** 378–85

Beard JD (2008) Assessment of surgical skills of trainees in the UK. *Ann R Coll Surg Engl* **90:** 282–5

Benes V (2006) The European Working Time Directive and the effects on training of surgical specialists (doctors in training): a position paper of the surgical disciplines of the countries of the EU. *Acta Neurochir (Wien)* **148**(11): 1227–33

Bhangu A, Hartshorne G (2011) Ward rounds: missed learning opportunities in diagnostic changes? *Clin Teach* **8**(1): 17–21

Department of Health (1993) *Hospital doctors: Training for the future: The report on the working group for specialist medical training.* Department of Health, London

Driscoll PJ, Paisley AM, Paterson-Brown S (2008) Video assessment of basic surgical trainees' operative skills. *Am J Surg* **196:** 265–72

Fernandez GL, Lee PC, Page DW, D'Amour EM, Wait RB, Seymour NE (2010) Implementation of full patient simulation training in surgical residency. *J Surg Educ* **67**(6): 393–9

Gofton W, Regehr G (2006) Factors in optimizing the learning environment in surgical training. *Clin Orthop Relat Res* **449:** 100–7

Hamdorf JM, Hall JC (2000) Acquiring surgical skills. *Br J Surg* **87**(1): 28–37

Hook SE, Banister GC, Topliss C, Webb J (2006) Letters and notes in orthopaedic surgery. *Ann R Coll Surg Engl* **88**(3): 292–6

Kanashiro J, McAleer S, Roff S (2006) Assessing the educational environment in the operating room – a measure of resident perception at one Canadian institution. *Surgery* **139:** 150–8

Kilminster SM (2000) Effective supervision in clinical practice settings: a literature review. *Med Educ* **34:** 827–40

Kurtz S, Silverman J, Draper J (1998) *Teaching and Learning Communication Skills in Medicine.* Radcliffe Medical Press, Abingdon, Oxon

Macafee DAL (2008) Is there a role for mentoring in surgical specialty training? *Med Teach* **30**(2): 55–9

Meterissian S, Zabolotny B, Gagnon R, Charlin B (2007) Is the script concordance test a valid instrument for assessment of intraoperative decision-making skills? *Am J Surg* **193:** 248–51

Miller A, Archer J (2010) Impact of workplace based assessment on doctors' education and performance: a systematic review. *BMJ* **341:** c5064

Monkhouse S (2010) Learning in the surgical workplace: necessity not luxury. *Clin Teach* **7**(3): 167–70

Paisley AM, Baldwin PJ, Paterson-Brown S (2001) Validity of surgical simulation for the assessment of operative skill. *Br J Surg* **88:** 1525–32

Paull DE, Mazzia LM, Izu BS, Neily J, Mills PD, Bagian JP (2009) Predictors of successful implementation of preoperative briefings and postoperative debriefings after medical team training. *Am J Surg* **198**(5): 675–8

Regehr G, MacRae H, Reznik RK, Szalay D (1998) Comparing the psychometric properties of checklists and global rating scales for assessing performance on an OSCE-format examination. *Acad Med* **73:** 993–7

Roberts NK, Williams RG, Kim MJ, Dunnington GL (2009) The Briefing, Intraoperative Teaching, Debriefing Model for Teaching in the Operating Room. *J Am Coll Surg* **208**(2): 299–303

Roche GR (1979) Much ado about mentors. *Harv Bus Rev* **1:** 14–31

Saedon H, Saedon M, Aggarwal SP (2010) Workplace-based assessment as an educational tool. Guide supplement 31.3-viewpoint. *Med Teach* **32**(9): 369–72

Schön D (1983) *The Reflective Practitioner.* Arena, Aldershot

Simpson C, Cottam H, Fitzgerald JE, Giddings CE (2011) The European working time directive has a negative impact on surgical training in the UK. *Surgeon* **9**(1): 56–7

Taffinder N (1999) Better surgical training in shorter hours. *J R Soc Med* **92**(7): 329–31

Vikis EA, Mihalynuk TV, Pratt DD, Sidhu RS (2008) Teaching and learning in the operating room is a two-way street: resident perceptions. *Am J Surg* **195:** 594–8

Wood M (1971) *The Art of Speaking.* David & Charles, Newton Abbot

KEY POINTS

- Shorter working hours have led to the need to maximize every learning opportunity available in the workplace.
- Extra effort is required on the part of the trainee to prepare for theatre sessions using traditional methods such as textbooks as well as newer methods such as online resources and simulators.
- Ward rounds, outpatient clinics and even administrative tasks can be used to improve knowledge and communication skills.
- Workplace-based assessments can be used as a learning tool by providing effective feedback and subsequent performance improvement.
- The role of the educational supervisor and mentor is becoming increasingly important, given the decline of the apprenticeship model of training, to provide support and guidance to trainees.

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