Chapter 6: Reviewing proceduralists

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Measurement of outcomes
Other measures

General practitioners are the doctors about whom most competence concerns are expressed to the Medical Council (Table 1). However, when the number in each specialty is taken into account, proceduralists occupy four of the top five places, representing a total of 56 (20%) of the 285 concerns the Medical Council has received. (We know that it is the combination of substandard performance with poor communication that leads to complaints about doctors, and we tend to stereotype surgeons in this mould; but after competence review, only 6 [18%] of the 34 doctors found to be practising at a substandard level were surgeons. That is the same percentage as received complaints, so the competence concerns about surgeons were similar to other doctors). Surgery is, of course, the stuff of drama, and some of these surgeons have been accorded very high profiles by the media. At high risk are the patients of surgeons who do few procedures, in hospitals that do few procedures: the relationship between volume of procedures and outcome is now well established.[1]

Table 1: competence concerns received by the Medical Council of New Zealand, by specialty

Specialty	No. with APC	No. of Concerns	Percent
General Surgery	196	23	11.7
Obstetrics and Gynaecology	200	17	8.5
GP (Gen Reg)	1304	104	7.8
Otolaryngology	77	5	6.5
Orthopaedics	171	11	6.4
GP (Voc Reg)	2098	93	4.4
Psychological Medicine	327	11	3.4
Radiology	237	4	1.7
Internal Medicine	580	10	1.7
Anaesthetics	422	7	1.7

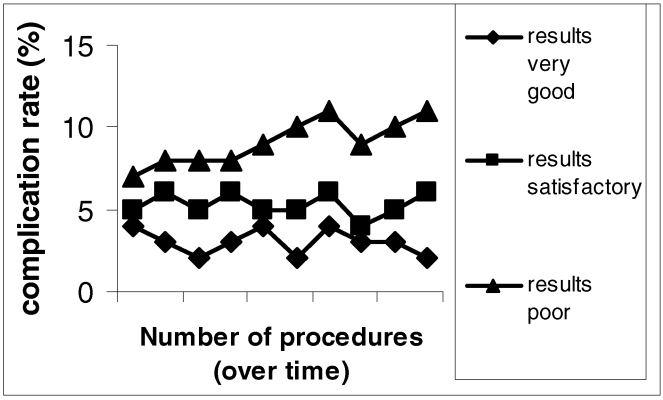
Cuschieri questioned UK master surgeons about competence and revalidation, using a Delphi survey.[2] The group agreed on the need for competence checks during the professional careers of surgeons, covering knowledge, as well as clinical, operative and humanistic skills, and they thought an external agency should do the assessments. However, they were concerned about the validity and reliability of existing systems. How then should the Council go about assessing procedural performance?

Measurement of outcomes

The history of surgical audit is outlined by Wright.[3] Audit implies measurement (counting complication rates and other outcomes), and publication (for peer review).

Let's look at a hypothetical procedure where the acceptable complication rate is 5%, and try to assess a surgeon according to outcomes (Fig.1). Large numbers of procedures are necessary for reliability: at fewer than 10 there are insufficient data to make an analysis. Beyond that a numerical audit of procedures will show complication rates with increasing accuracy, and even a retrospective audit can be useful in assessing surgical performance. As with all things, prospective audits can be designed for specific purposes, and have advantages over retrospective ones – and of course surgeons practising at a substandard level will often have substandard recording of their outcome audits.

Figure 1: assessing the outcome of a procedure



Simple outcomes have limited meaning, unless stratified for surgical risk, and various methods have been devised for such adjustments.[4, 5] Outcomes are also dependent on the whole surgical team (not just the surgeon) so they measure performance rather than competence.[6] A competent surgeon may

perform poorly because of problems with the team, hospital, health service or because of illness or stress.

Other measures

There are other important measures to be considered apart from outcomes: knowledge, clinical and communication skills in the outpatient department or clinic, case selection, manual dexterity, hand-eye coordination, and disruptive behaviour (poor team player) for instance.

For such assessments in New Zealand we have chosen a kit of review tools, including the case-based oral, record review, interview, sitting in on clinics, obtaining ratings from peers and co-workers, and direct observation of procedures. Objective assessment of surgical skills can be undertaken in the clinical skills laboratory, on virtual reality (VR) simulators, by direct observation in theatre, or by video recording. Tests of psychomotor skill have a limited place as 75% of events in an operation concern decision making ability and 25% relate to manual dexterity.[7] However, more advanced simulations can also test decision making ability.

In Britain, the General Medical Council's proposals include a "Phase 1 peer review" of all doctors, comprising extended curriculum vitae, structured interview, medical record keeping, case based discussion, observation of consultation, third party interviews, site tour (two medical and one lay assessor). For surgeons who appear to be practising at a substandard level at Phase 1, there are "Phase 2 tests of competence", comprising a knowledge test (200 items, matching sets format), communication skills (ten simulated patients), technical skills (nine or ten OSCE stations, seven generic & two or three specialty specific).[8]

The OSCE for technical skills is renamed OSATS (Objective Structured Assessment of Technical Skills).[9] The generic simulations test scrubbing & gowning, preparing the patient, knotting, suturing, vessel ligation, tissue dissection, and hand eye coordination. The tests have been shown to discriminate well between volunteer surgeons, and those performing at a substandard level.[10] The specialty specific simulations test more advanced (integrated) procedural skills such as laparoscopic cholecystectomy. Task-specific checklists are useful for simple simulations but global ratings are better for complex procedures, especially when assessing experts.[11]

Sophisticated virtual reality (VR) simulators are available for anaesthetics and may be the only way to assess an anaesthetist's performance in response to an emergency objectively. Endoscopy simulators are now available for bronchoscopy, fiberoptic intubation, gastrointestinal endoscopy, ureteroscopy and angiography. Validation studies have shown significant differences in bronchoscopy simulator performance among novices, intermediates and experts.[12] testing on a VR laparoscopic simulator also correlates well with intraoperative assessment during laparoscopic cholecystectomy.[13] VR simulators are not yet available for open procedures, partly because of the problems of providing tactile (haptic) feedback. However advances in computer processor power mean that such simulators

are now on the horizon. VR simulators provide automated scoring systems that avoid the risk of observer bias.

Direct observation in theatre is probably the "gold standard", and has good inter-rater reliability.[14] However, direct observation is costly in terms of assessor time and can have positive or negative effects on performance (audience effect).[15] Direct observation also requires thorough training of the assessor to prevent observer bias (halo effect).[16] Blinded video recording tends to avoid both effects and can be quicker because of the ability to "fast-forward", but there may be some loss of information compared with direct observation.[17]

References

1. Cuschieri A, Francis N, Crosby J, Hanna GB. What do master surgeons think of surgical competence and revalidation? Am J Surg 2001: 182: 110-6.
2. Soljak M. Volume of procedures and outcome of treatment. Editorial. BMJ 2002; 325: 787-8.
3. Wright JE. The history of surgical audit. J Qual Clin Pract 1995; 15: 81-8.
4. Pillai SB, van Rij AM, Williams S, Thomson IA, Putterill MJ, Grieg S. Complexity- and risk-adjusted model for measuring surgical outcome. Br J Surg 1999; 86: 1567-72.
5. Sutton R, Bann S, Brooks M, Sarin S. The Surgical Risk Scale as an improved tool for risk-adjusted analysis in comparative surgical audit. Br J Surg 2002; 89: 763-8.
6. Rethans J-J, Norcini JJ, Baron-Maldonado M, Blackmore D, Jolly BC, LaDuca T, Lew S, Page GG, Southgate LH. The relationship between competence and performance: implications for assessing practice performance. Med Ed 2002; 36: 901-9.
7. Spencer P.C. Teaching and measuring surgical technique-the technical evaluation of competence. Bull Am R Coll Surg 1978; 63: 9-12.
8. Southgate L, Cox J, David T, Hatch D, Howes A, Johnson N, Jolly B, Macdonald E, McAvoy P, McCrorie P, Turner J. The assessment of poorly performing doctors: the development of the assessment programmes for the General Medical Council's Performance Procedures. Med Ed 2001; 35(suppl): 2-8.
9. Reznick RK. Teaching and testing technical skills. Am J Surg 1993; 165: 358-61
10. Beard JD, Jolly BC, Southgate LJ, Newble DI, Thomas WEG, Rochester J. Developing assessments of surgical skills for the GMC Performance Procedures. Br J Surg (submitted).
11. Martin JA, Regehr G, Reznick R, MacRoe H, Murnaghan J, Hutchinson C. Objective structured assessment of technical skill (OSATS) for surgical residents. Br J Surg 1997; 84: 273-8.
12. Ost D, DeRosiers A, Britt EJ, Fein AM, Lesser ML, Mehta AC. Assessment of a bronchoscopy simulator. Am J Respir Crit Care Med. 2001 Dec 15;164(12): 248-55.
13. Scott DJ, Bergan PC, Rege RV, Laycock R, Tesfay ST, Valentine RJ, Euhus DM, Jeyarajah DR, Thompson WM, Jones DB. (2000) Laparoscopic training on bench models: better and more cost-effective than operating room experience? J Am Coll Surg 2000; 191: 272-83.
14. Beard JD, Jolly BC, Newble DI, Thomas WEG, Donnelly J, Southgate LJ. Assessing the technical skills of surgical trainees. BMJ (submitted)
15. Cottrell NB. Performance in the presence of other human beings. Social facilitation and irritative behaviour. Alyn and Bacon 1965. Boston.

16. Warf BC, Donnelly MB, Schwartz RW, Sloan DA. The relative contributions of interpersonal and specific clinical skills to the perception of global clinical competence. J Surg Res 1999; 86: 17-23.
17. Scott DJ, Rege RV, Bergen PC, Guo WA, Laycock R, Tesfay ST, Valentine R.J, Jones DB. Measuring operative performance after laparoscopic skills training: edited videotape versus direct observation. J Lap Adv Surg Tech 2000; 10: 183-90.