

EDITORIAL I

Measurement of competence

Training in anaesthesia is in a melting pot. The pressures on both trainees and trainers have increased as a result of the reduction in junior hospital doctors' working hours and the influence of the emergence of NHS Trusts in which service commitment is given greater prominence. These factors coupled with the EU Directive on duration of specialty training and the response to it by Dr Calman have forced us into a new paradigm, and to move from traditional training by apprenticeship to adopting a more rigid structure.

It has been estimated that scientific knowledge doubles every 6 yr. In the past 6 yr anaesthetic practice has changed markedly with the widespread use of the laryngeal mask, the greatly increased use of local anaesthesia, especially in obstetrics, the use of PCAS for postoperative pain control, the emphasis on day-case surgery, the introduction of new drugs, the increasing use of TIVA and the great improvements in monitoring. The increasing knowledge base affects all branches of medicine and surgery, and especially undergraduate training, hence the GMC's recognition of the need to define core knowledge rather than pretending that the undergraduate can be proficient in all areas.

A first attempt by the Royal College of Anaesthetists to introduce structure in training was the publication of the specialist training in anaesthesia, supervision and assessment (STASA) document in which formalized modular training was proposed. It became clear that a tight modular structure of this type could not be achieved in many training centres. A second option of targeted case training was considered carefully and this has been modified to produce the current structured training scheme which is presently under scrutiny by the college tutors. There is an assumption that the weighting of training in the subspecialties will follow the STASA recommendations, and the level of supervision must be appropriate to the individual trainee's needs, depending on his/her theoretical knowledge, overall experience and practical skill.

Attainment of theoretical knowledge is straightforward. All trainees have access to departmental seminars and to regional courses to prepare for the FRCA examinations, and the recent publication of the FRCA syllabus provides valuable guidance. There are many excellent textbooks and review articles to help the trainee; all trainees should be supervised closely by college tutors and have regular appraisal of their achievements by the postgraduate deans and regional advisers. For theoretical knowledge the FRCA examination is the "gold standard".

However, it is a different story when considering practical skills. The assumption in the STASA approach that exposure for a predetermined time in a clinical subspecialty will ensure competence in that clinical area is clearly flawed. We all know of some trainees who gain competence rapidly, and a few who never do; hence the need to match level of supervision to the individual trainee rather than on a time of exposure basis. The proposed college structured training scheme is designed to dovetail practical experience with topic teaching for the first two senior house officer years of training. If this approach is accepted the scheme will be extended to include the first specialist registrar pre-fellowship year.

In the past, and indeed at the present time, competence in the practical skills of anaesthesia is not measured formally. The closest approach to assessment is by haphazard observation and to a limited extent by personal audit. The current logbook is of little help because a target number of cases does not guarantee ability. The greater use of the OSCE in the fellowship examinations is to be applauded, yet the scope of the OSCE is very limited. Some topics such as CPR, cannulation of central veins, mini tracheostomy, etc, can be tested using manikins. OSCEs have been used as a teaching aid for final year undergraduates who have limited exposure to patients to learn practical skills such as vascular cannulation, etc [1].

However, for the more complex procedures (extra-dural catheterization, spinal anaesthesia, arterial puncture) the use of a manikin is inappropriate. In this issue Kestin [2] describes a statistical assessment of competence for practical procedures. The statistical method utilizes the cumulative sum (cusum) of a trainee's experience of a particular practical technique and compares an individual's results with a predetermined acceptable failure rate. The technique has been used to discern trends in a graphical format and is particularly powerful for examining sequential events over a period of time [3].

For the cusum analysis to be undertaken, the acceptable success and failure rates need to be defined [4]. The statistics are not complicated but need to be studied carefully. The technique is essentially a self-assessment and demands complete honesty on the part of the trainee.

A major attraction of the cusum analysis is that it can provide a quantitative and continuous assessment of practical capability. As with all better audits, a standard is set and the individual compares him/herself against that standard. When used for initial training it should be possible to identify the

trainee with particular difficulties and it could provide the evidence that a particular trainee requires more or less supervision. Also, it could illustrate the beneficial effects of a particular training environment, thereby providing a commentary on the standard and efficacy of the trainers, in addition to identifying better techniques.

As a quality control tool, cusum analysis could be part of every consultant's continuing assessment. It is interesting to note in Kestin's article the periods of poor performance interspersed with satisfactory performance—I suspect this happens to all of us.

A quantitative approach to education is overdue. In the past there has been too much reliance on examinations as the only guide to the acquisition of knowledge. Anaesthesia may lend itself to the newer concepts of experiential learning [5] and perhaps, as part of this, the use of simulators should be considered [6, 7].

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References

1. Critchley LAH, Short TG, Buckley T, O'Meara ME, Gin T, Oh TE. An adaptation of the objective structured clinical examination to a final year medical student course in anaesthesia and intensive care. *Anaesthesia* 1995; **50**: 354–358.
2. Kestin IG. A statistical approach to measuring the competence of anaesthetic trainees at practical procedures. *British Journal of Anaesthesia* 1995; **75**: 805–809.
3. Altman DG, Royston P. The hidden effect of time. *Statistics in Medicine* 1988; **7**: 629–637.
4. Williams SM, Parry BR, Schlup MT. Quality control: an application of the cusum. *British Medical Journal* 1992; **304**: 1359–1361.
5. Tweed WA, Domen N. The experiential curriculum—an alternate model for anaesthesia education. *Canadian Journal of Anaesthesia* 1994; **41**: 1227–1233.
6. Doyle DJ, Arellano R. The virtual anaesthesiology (TM) training simulation system. *Canadian Journal of Anaesthesia* 1995; **42**: 267–273.
7. Hartmannsgruber M, Good M, Carovano R, Lampotang S, Gravenstein JS. Anaesthesia simulators and training devices. *Anaesthetist* 1933; **42**: 462–469.