Surgical education: the new curriculum and training in the UK

Surgical education in the UK has been changing in the past two decades, as a result of the Calman reforms and Modernising Medical Careers. The surgical curriculum has been planned to promote global competence development and based on modern concepts of adult learning.

Postgraduate surgical training in the UK has developed since the formation of the NHS. Social, political, professional and economic developments led to a need for a formal training programme. The regulations of the European Union, advances in health care and delivery, and a culture of accountability and transparency significantly influenced the developments. Advances in technology and practice of surgery and development of medical education led to the concept of a competence-based curriculum and training.

The curriculum produced by the Intercollegiate Surgical Curriculum Programme (2007) is intended to develop consultants who can deliver elective and emergency care in the NHS. The teaching, learning and assessments are mainly work based in a multidisciplinary set up, according to the principles of adult learning. The curriculum was planned and designed to conform to the concept of education as a process with some elements of the concept of education as research. However, as a result of problems with implementation, the curriculum experienced by learners is that with the concept of education as a product with only some elements of education as a process.

The surgical curriculum

The curriculum for postgraduate surgical education is designed to produce generalist consultant surgeons who are able to deliver an elective and emergency service together with specialist services to a defined level. The key principles of the curriculum are systematic progression, competence-based outcomes, a robust assessment process, delivery by appropriately qualified surgeons, in a multidisciplinary environment for surgical care and collaboration with those responsible for delivery of health services and training. The curriculum was developed through the Intercollegiate Surgical Curriculum Programme of the Joint Committee on Higher Surgical Training, involving surgical Royal colleges, specialty associations, practising surgeons, trainees and educationalists.

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Curriculum standards and components

The curriculum is based on the professional values and competences laid down in *Good Medical Practice* (General Medical Council, 2006) and the CanMED 2000 framework of the Royal College of Physicians and Surgeons of Canada (1996). The educational framework is built on competence in knowledge, judgement, clinical skills and professionalism relating to specified stages in the development. The core components are syllabus content, teaching and learning, assessment, and systems and resources.

Teaching and learning

The training is planned to occur in a multidisciplinary setting with involvement of various professional groups. The balance between didactic teaching and learning in clinical practice will change as the trainee progresses through the training programme, with the former decreasing and the latter increasing. The educational supervisor assigned to a trainee has an important role in setting learning objectives, monitoring progress and ensuring adequate training is delivered. The programme directors (and assigned educational supervisor) define the parameters of practice and monitor the delivery of training to ensure the trainee has exposure to sufficient learning opportunities. Learning agreements and the trainee's portfolio are integral parts of the training programme. Learning opportunities available to trainees are:

1. Work-based learning, mainly based on clinical practice along with systematic feedback, reflection and formative assessments
2. Learning from formal situations such as courses and conferences
3. Self-directed learning – study groups, journal clubs, peer review and personal study.

Assessment and feedback

The assessment system is designed to determine whether trainees are meeting the standards of competence and performance specified at various stages of training, and it provides systematic and comprehensive feedback as part of the learning cycle. Components of the assessment system are:

1. Workplace-based assessments covering skills, knowledge, behaviour and attitudes
2. A logbook of procedures undertaken
3. Examinations: Membership of the Royal College of Surgeons, Fellowship of the Royal College of Surgeons
4. The learning agreement and the assigned educational supervisor's report
5. An annual review of competence progression.

Workplace-based assessment methods are the mini-peer assessment tool, mini-clinical evaluation exercise, case-based discussion, direct observation of procedural skills in surgery and procedure-based assessment. The trainee's assessors are usually the assigned educational supervisor and colleagues. These tools are designed to provide immediate feedback as part of the process. Assigned educational supervisors provide further feedback to each of their trainees through regular planned educational review and appraisal.

The training system

This training system includes the selection process into surgical training, the structure of training, academic training pathways, out-of-programme research and the roles of various personnel involved in training programme.

Quality assurance

Procedures in place for quality assurance are the surgical trainee experience survey, annual monitoring carried out by the deanery or school of surgery for evaluation of programme delivery, operation and outcomes, deanery reviews, and registration of trainers to maintain their quality.

Curriculum concepts

Development of postgraduate surgical training in the UK

Traditionally surgery was taught as an apprenticeship to a senior practitioner, which continued until the 20th century. Initially apprenticeship and acquisition of the Fellowship of the Royal College of Surgeons enabled one to become a practicing surgeon. Following the formation of the NHS in 1948 surgical training acquired a more formal structure. It required basic surgical training, completing the primary and final examinations of Fellowship of the Royal College of Surgeons, and many years of experience as a registrar and senior registrar grade before becoming a consultant surgeon.

The Calman report (Department of Health, 1993) led to reforms in higher surgical training with the abolishment of the registrar and senior registrar grades, and creation of a streamlined specialist registrar grade. *Unfinished Business* by Sir Liam Donaldson (Department of Health, 2002) and consultations resulted in the launch of Modernising Medical Careers in 2003, which introduced the 2 years of the foundation training programme, the 'run-through' specialty training programme, a comprehensive curriculum and regular assessment of competence.

Curriculum

The curriculum is a plan of everything that happens in relation to an educational programme. The exact definition of a curriculum is difficult but it includes a plan that will determine educational experience, objectives, syllabus, timescale, learning experiences, assessments and evaluation process. The Postgraduate Medical Education and Training Board (2008) defines curriculum as a statement of the intended aims and objectives, content, experiences, outcomes and processes of an educational programme including: a description of training structure and expected methods of learning, teaching feedback and supervision. The important aspects that require attention in developing a curriculum for postgraduate medical education is the kind of doctors it is intended to produce, characteristics of professional practice that need emphasis, and the activities which teacher and learner should engage in during the process of education.

Curriculum in three levels

1. The planned curriculum: intended by the stakeholders' group and produced in print
2. The delivered curriculum: organized by the administrators and taught by the teachers; in postgraduate surgical training the curriculum delivered by the deaneries, educational institutions (hospitals) and trainers
3. The experienced curriculum: that is learned by the trainees (Prideaux, 2003).

Educational approach to curriculum modelling

Education is a conscious effort via activities of teaching, learning and appropriate assessments to advance knowledge, skills and behaviour to attain a specific level of competence. The practice of education seeks to open minds, liberate thinking, encourage critique, explore the foundations of good practice and develop creativity (Fish and Coles, 2005). It is a morally informed and morally committed action because the educator enables the process of development in the learner (Car, 1995). In medicine educational practice intends to cultivate intelligent practice in a learner to attain competence, which should mean the holistic nature of a person's ability relevant to his/her specialty or area of practice.

The activity resulting in sound educational development in a learner must link the educational aims and activities of teaching, learning and assessment. The conceptualisation of association of teacher–learner in teaching, learning and assessment results in different kinds of education and curriculum models – the product, the process and the research models. In each of these models the context for which the learners are prepared is different and leads to different kinds of achievement for the learner as do the conceptions about the role of the teacher, the learner and assessment.

The product concept

The product concept of education and the resulting curriculum model is based on the theories of Franklin Bobbitt and Ralph Tyler where education is seen as a technical exercise (to produce) – objectives are set, a plan drawn up, then applied, and the outcomes (products) measured (Bobbitt, 1918, 1928; Tyler, 1949). The aim of the learners is to come and possess a commodity that the teacher has to give. The teacher is seen as a locus of knowledge and the learners receive that knowledge in a passive manner. This model shares characteristics of a 'transmission model' of education that equates the curriculum with a syllabus (body of knowledge) and education is the process by which this is transmitted or delivered to students (Belkin et al, 1992). The assessments are the end of course tests which are mainly summative, planned by the teacher and the performance represents outcome of the educational exercise (objectives).

The process concept

The process concept of education, proposed by Stenhouse (1975), focuses on active learning: acquiring, using and evaluating the knowledge as a result of an interaction between teacher and learner. The role of teacher is that of catalyst, still an agent of knowledge and the assessments are part of learning process – either formative or summative – which stress the understanding.

The research concept

The education as research concept enables trainees to explore understanding as mature self-directed learners, promotes collaborations for learning and encourages trainees to construct their own knowledge. The teacher acts as a mentor, part of the group who learns alongside them, and the

assessments are self-directed or peer assessments and enhance understanding through new experiences and regular reflections. This concept of education and the resulting curriculum model has foundations in adult learning theory that promotes active self-directed learning towards personally relevant goals.

The planned surgical curriculum

The curriculum is clear about the kind of surgeons it is intended to create to ensure high-quality and safe surgical care delivery, and specifically to meet the service requirements of the NHS. It sets standards for development of surgeons which are based on well-recognized frameworks and principles set by professional bodies. The key principles that form the basis of the curriculum are planned to be coherent with teaching, learning and assessment methods. The education programme is planned for global competence development according to the stage of development and the competence development is expected to follow the pattern of Miller's pyramid (Norcini, 2003).

The principles of adult learning form the basis of the curriculum and specify establishment of a learning partnership between trainer and trainee. The trainer takes the role of facilitator to help the trainee through education, and ensuring the teaching, learning and assessment goes 'according to the plan' (according to the curriculum). Here the training programme is planned to create consultant surgeons to work in the NHS and the content of the curriculum comes from outside the sphere of learner and teacher.

The feature of planned teaching, learning and assessment process in the curriculum is based on real time work-based experiences and learning semi-collaboration with the trainer that is characteristic of the concept of education as a process. Systematic feedback and formative assessments facilitate learning and chart the trainee's progress in the programme. Assessments enhance the trainee's learning and allow both trainee and trainer to reflect on the process of teaching and learning. Self-directed learning exercises and reflective practice are incorporated in the curriculum to promote education as research, but the overall character is more as a process.

The curriculum and surgical training

The curriculum is planned and developed along sound educational principles, but expected outcomes are distorted because of problems in implementation. Deaneries and NHS hospitals are involved in implementation, and programme directors and assigned educational supervisors as individuals have key roles in implementation. The problems that affect the implementation are priority for service delivery, working time regulations, communication, understanding of principles of education, and resources.

In hospitals service provision takes priority over training issues because hospitals are assessed and rated by their performance in provision of services. The pressures to meet service-related targets erode the quality of work-based education and worthwhile educational opportunities such as training lists become unavailable for trainees (Joint Committee on Surgical Training, 2009).

A survey among surgical trainees confirmed that there was a significant imbalance between training and service provision at work (Lowry and Cripps, 2005). Implementation of the European Working Time Directive decreased effective time available for training and resulting shift work patterns caused serious disruptions in work-based education (Richards and Jones, 2008). The work pattern of a shift system significantly reduces the opportunity for trainer and trainee to work together (Joint Committee on Surgical Training, 2009).

Many trainees have inadequate understanding of the principles of education. This prevents them from fully experiencing the curriculum and means that they do not manage their learning and assessments as well as they could. The problems could be in setting educational objectives, receiving feedback and understanding assessment tools.

The lack of support and training of trainers will weaken the learning partnership in accordance with the principles of adult learning. Formative assessment and systematic feedback are the corner stone of work-based surgical education. Defective practice of assessment tools and unsystematic feedback fail to identify trainees' strengths and areas that need development (Pereira and Dean, 2008). At present there is no dedicated system to educate trainers and trainees on principles of surgical education and poor support from trust management for educational roles for consultant surgeons (Association of Surgeons in Training, 2009; Joint Committee on Surgical Training, 2009).

In the author's experience, self-directed learning practices such as establishment of learning collaborations and peer reviews are rare among trainees. Clinical placements may be determined by programme directors and trainees may have limited choice relating to their educational needs. Again needs of service provision take priority and educational leaders have only limited powers to take action. Inadequacy of resources adversely impacts on work-based learning and restricts attendance of external learning programmes to supplement work-based learning. This does not qualify as a learner-oriented management of resources and may not relate to the learner's context.

The problems in implementation cause the learners to experience the curriculum as one with educational concept as a product and having minimal process concept. Solutions for these problems are: separate training from service provision, include quality of educational activities in the criteria for assessing hospitals, educate trainees and trainers in principles of adult education, and robust criteria for identifying training units.

KEY POINTS

- The planned surgical curriculum conforms to modern educational principles and reflects the concept of education as a process.
- The curriculum delivered and experienced by trainees reflects the concept of education as a product because of problems with implementation.
- A robust education system, discrete monitoring and funding, and educating trainers and trainees about the principles of education are proposed for improvement.

Conclusions

The new surgical curriculum is intended to create generalist consultant surgeons and to ensure safety and quality of care delivery. The educational framework is for development of global competence development based on principles of adult education, and values and competences recommended by professional bodies. Various problems with implementation such as service priorities, working time restrictions, defective practice of educational tools and inadequate support for educational activities make the implemented or experienced curriculum significantly different to that which was planned. **BJHM**

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