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General surgery education across three continents

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ABSTRACT

Surgical education has seen tremendous changes in the US over the past decade. The Halstedian training model of see one, do one, teach one that governed surgical training for almost 100 years has been replaced by the achievement of the ACGME competencies, milestones, entrustable professional activities (EPAs), and acquisition of surgical skill outside the operating room on simulators. Several of these changes in American medical education have been influenced by educators and training paradigms abroad. In this paper, we review the training paradigms for surgeons in the UK, Japan, and Mexico to allow comparisons with the US training paradigm and promote the exchange of ideas.

1. Introduction

Surgical education has seen tremendous changes in the US over the past decade. The Halstedian training model of see one, do one, teach one that governed surgical training for almost 100 years has been replaced by the achievement of the Accreditation Council for Graduate Medical Education (ACGME) competencies, milestones, entrustable professional activities (EPAs), and acquisition of surgical skill outside the operating room on simulators.[1] Several of these changes in American medical education have been influenced by educators and training paradigms abroad. The training model that Halsted implemented and has served as the backbone for the education of generations and generations of US surgeons was influenced by Halsted's experiences with the German training system.[2] Further, the most recent paradigm shift in education was the development of EPAs by Olle ten Cate in the Netherlands.[3] These examples provide evidence that the exchange of ideas among educators from different countries has the potential to significantly influence training. In an effort to promote the exchange of ideas and discussion among surgical educators from around the world, the Association for Surgical Education in its 2017 annual meeting invited reputable surgical educators from three different continents to participate in a panel that led to a lively and exciting discussion. In this paper, we describe graduate surgical education in the United Kingdom (UK), in Japan, and in Mexico. Table 1 provides comparative data of these training systems and contrasts them to US training.

2. Surgical training in the UK

2.1. Present state

Medical students in the United Kingdom (UK) typically spend five to six years at medical school, entering around the age of eighteen after finishing secondary school. After medical school, all graduates must work for two years as Foundation Doctors to gain full registration as medical practitioners involving four to six month attachments in a variety of medical and surgical specialties. The decision to become a surgeon usually means application for core surgical training. Core surgical training is still a popular choice in the UK with a ratio of 2.56 applicants per available post.

Core training is two years of general professional surgical training comprising a wide range of surgical specialties with entry through a competitive national selection process. Core training has broad and basic learning objectives; successful completion of core training requires regular positive workplace based assessment and passing the Membership of the Royal College of Surgeons (MRCS) examination.

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Table 1
Comparison of surgical training programs across the three countries.

	US	United Kingdom	Japan	Mexico
Medical school duration	4 years	6 years	6 years	6 years
Residency duration	5 years	2 years core + 6 years surgical training	2 years core + 3 years general surgery	4-5 years
Number of residency programs	277	15	188	22
Number of general surgery residents	8086	1240	4642	721
Resident selection process	National (exam and interviews)	National (exam scores and interviews)	Up to the individual hospital	National (matched based on exam score ranking, hospital interview)
Graduation requirements	Completion of training program, 850 cases (200 during chief year)	Completion of training program, Minimum numbers of index cases, annual review of competence progression	5-year residency and 350 total cases (120 primary)	Passing score on annual exams No case minimums Research thesis completion and defense Final oral exam
Working hours per week	80	48	No limits exist	No limits exist
Board certification (pass rate)	90%/79%[a]	85%	81.4%	73%
Number of residents pursuing fellowship	80%	70%	No fellowships exist	~60%
% female residents	40%	30%	20.3%	34.7%

[a] Percentages for qualifying and certifying exams, respectively.

Upon completion of core training, most trainees apply for higher surgical training in one of the recognized surgical specialties. Higher surgical training programs are of 5–6 years duration. Again, entry into higher surgical training is by competition – most training programs now recruit through a benchmarked and validated system of national selection process, with 36% of core surgical trainees being successful on their first application.

The national selection process for both basic and higher surgical training has evolved to ensure that the selection process is fair, structured and transparent. All surgical specialties produce a person specification that provides a transparent blueprint for applicants to aspire to and selection panels to measure against. The selection process is similar to a series of Objective Structured Clinical Examination (OSCE) stations, where candidates are assessed on their portfolios, communication skills, clinical skills and other attributes. Performances are measured using well-defined criteria, score sheets and interviewers are trained to maximize fairness, and the whole process is Quality Assured by lay and professional assessors.

Progression through higher surgical training is by a series of rotations, which usually last for one year each, in a variety of hospitals within a particular region. For each rotation, the trainee has an assigned educational supervisor whose job it is to set the learning goals for that trainees' experience and to ensure that they are met by the end of the rotation.

In the UK, all surgical training programs use an online portfolio – the InterCollegiate Surgical Curriculum Programme (www.ISCP.ac.uk). This contains the curricula for all the surgical specialties, and lays out exactly what is required of each trainee, in each specialty, for each year of training. All trainees and trainers are registered with the ISCP system, and the trainees use this online portfolio to gather evidence of their progress through the training program.

An annual review of competence progression (ARCP) takes place for each trainee at the end of every year. This is chaired by the relevant Training Program Director, and involves the specialty training committee who review each trainee's progress as recorded in their ISCP portfolio and ensure that trainees are progressing as expected. Trainees need to demonstrate positive progression in each year, by logging adequate numbers of operative cases, performing a variety of workplace based assessments, and recording these in the ISCP portfolio.

Satisfactory completion of the training program and passing the Fellowship of the Royal Colleges of Surgeons (FRCS) specialty specific examination results in the award of a Certificate of Completion of Training (CCT), which means that the trainee has acquired all the necessary competencies to practice independently and can apply for employment as a consultant (attending). Unlike in the USA, there are no recognized Fellowship programs in the UK, but still up to two thirds of trainees will undertake some form of unofficial fellowship training, either in units in the UK or overseas.

2.2. Challenges

While the current UK training system has much to be proud of, there is room for improvement. Every year the UK General Medical Council, our regulatory body, undertakes a survey of all trainees in all specialties, and unfortunately, surgical trainees have the lowest satisfaction ratings with their training.[4] We are aware that much of that dissatisfaction lies within the early years of surgical training, particularly the core surgical training years. As these doctors are the most junior tier of surgical access, they tend to spend much of their time on call for emergency duties with the result that they spend little time in the operating room. Due to working time restrictions in the UK (doctors in training are limited to an average of 48 h per week at work) they also tend to be on various patterns of shift work, so limiting their exposure to daytime training opportunities.

These data have brought into sharp relief the current challenges faced in UK surgical training. We have an imbalance between training and service provision. There is a lack of time for training generally, not only from the point of view of the trainees, but also from the viewpoint of the trainers. We have an inflexible training system – although it purports to be competency based it is in fact

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