



## ■ GENERAL ORTHOPAEDICS

# The dawn of a new competency-based training era

## A 70-YEAR PERSPECTIVE ON POST-GRADUATE TRAINING REFORM IN TRAUMA AND ORTHOPAEDIC SURGERY

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The imminent introduction of the new Trauma & Orthopaedic (T&O) curriculum, and the implementation of the Improving Surgical Training initiative, reflect yet another paradigm shift in the recent history of trauma and orthopaedic training. The move to outcome-based training without time constraints is a radical departure from the traditional time-based structure and represents an exciting new training frontier. This paper summarizes the history of T&O training reform, explains the rationale for change, and reflects on lessons learnt from the past.

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### Introduction

The fundamental principles of the structure and delivery of surgical education have remained largely unchanged for a generation, despite significant training climate changes related to unprecedented service pressures placed on the NHS,<sup>1-3</sup> economic uncertainty,<sup>4</sup> working hour restrictions,<sup>5-7</sup> and increasing problems relating to trainee recruitment,<sup>8</sup> retention,<sup>9</sup> and morale.<sup>10</sup> Widespread reforms are currently underway to modernize training in order to mitigate the impact of these challenges, which are principally being driven by the desire to deliver a high-quality end product of training: a safe, effective 'day 1' consultant.<sup>11</sup>

With the imminent introduction of the new T&O curriculum in August 2021<sup>12</sup> and the significant associated changes in the training assessment processes,<sup>13</sup> it is important to understand the historical drivers of these reforms. In this paper we aim to provide a summary of the recent history of T&O training reform, to explain the rationale for change, and to reflect on lessons learned from the past. As a novel contemporary account of T&O training reform, we hope that this will be of interest

to trainers, trainees, and surgical education-ists alike. The key changes are summarized in Figure 1.

### 1950 to 1980s: the Halstedian era

Orthopaedic surgical training in the young, post-war NHS of the 1950s was quite different to that of today.<sup>14,15</sup> Surgical procedures tended to be performed by surgeons with a general interest, the range of procedures performed was limited by modern standards,<sup>15</sup> and treatment goals less ambitious. There were few opportunities to develop a sub-specialist interest, this only being possible as part of further career development at consultant level. Operations were relatively crude without there being arthroscopic or minimally invasive options. Early postoperative recovery tended to be prolonged with an emphasis on bedrest rather than active rehabilitation. Patients were not expected to ask questions of their surgeons or to actively participate in decision-making, a reflection of the prevalent paternalistic medical culture.<sup>16</sup> Hospital inpatient stays were longer, throughput was lower, and surgeons-in-training had overall responsibility for fewer patients, albeit for the full duration of their inpatient stay.<sup>16</sup> Trainees

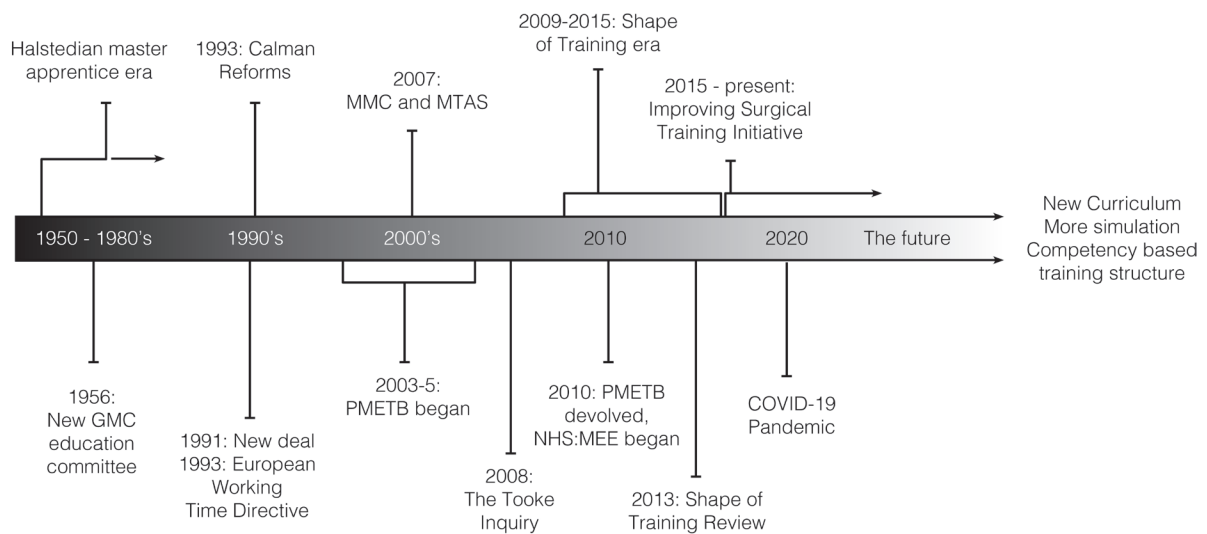
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Figure 1:

Schematic timeline showing key events in Trauma & Orthopaedic training 1950-present



#### Abbreviations:

GMC = General Medical Council | MMC = Modernising Medical Careers

PMETB = Postgraduate Medical Education Training Board | NHS:MEE = National Health Service Medical Education England

Fig. 1

Schematic timeline showing key events in Trauma & Orthopaedic training, 1950-present

therefore tended to work at a relatively lower intensity but for longer hours, and in return they received relatively low pay. This was the era of the true apprentice trainee, but as the NHS began to develop, deficiencies began to be recognized. Surgeons were exposed to more than 30,000 hours of operating time during typical training,<sup>17</sup> and training entry and exit points were ill-defined. There was no curriculum and no formal assessment of training progression, with surgeons-in-training passing up the ranks when their superiors deemed them 'ready' – a subjective and nepotistic process – with no mechanism for identifying and remediating "failing" trainees.<sup>18,19</sup>

The master-apprentice model was first described by Sir William Halstead in 1889.<sup>20,21</sup> Central to this was a process of 'graded responsibility';<sup>20,22</sup> the apprentice surgeon would observe the master at work and progress from observation, to performing part of a procedure under supervision, to performing entire procedures under supervision, and finally to independent practice.<sup>22</sup> The success of this model relied on the three key factors described by Walter,<sup>23</sup> firstly access to large case numbers with multiple, reproducible opportunities for repetition of skills, secondly long hours of work to ensure adequate case exposure, and thirdly supervision provided by patient, skilled consultant mentors.

Apprenticeship-by-osmosis, in contrast to the idealized model of apprenticeship-by-coaching described by Hargreaves et al,<sup>24</sup> was the early default training method in surgery despite its recognized idiosyncrasies and tendency towards 'unplanned, unsystematic and unsupported' learning.<sup>23,25</sup> This style of training persisted in part because of a failure to identify the importance that should be attached to the status of the trainer (master)<sup>26</sup> and in part because of trainers' tendency to exhibit training behaviours they had been exposed to as trainees.<sup>27</sup>

For much of this era, private practice prevailed, and it was not in many consultants' interests for there to be an efficient and effective training system or indeed for there to be an expansion of consultant numbers. Aspiring surgeons had traditionally paid for the privilege of working for a well-renowned "firm", this in return giving them access to a potentially lucrative consultant career. The end of training was therefore often dictated by the death or retirement of a consultant whose shoes could be filled by someone familiar with his (and it was almost invariably a "his") practice.

Problems with the unstructured nature of surgical training began to be recognized and efforts to introduce regulation were made as early as 1950. The Medical Act of 1950<sup>28,29</sup> made the requirement of the 'house year' – the

first year of supervised clinical practice after graduation – mandatory. The Medical Act of 1956 charged the newly convened General Medical Council (GMC) Education Committee with statutory responsibility for regulating post-graduate training in the UK, and by the 1960s there was pan-collegiate recognition of all non-consultant posts as ‘training grades’, with the requirement for NHS hospitals to support post-graduate education.<sup>29</sup> By the early 1970s there was an increasing recognition of the need for coordination of post-graduate training, which was previously highly heterogeneous and hospital-dependent.<sup>29</sup> The creation of Post-graduate Training Committees affiliated to local universities facilitated coordination of training for the first time.<sup>29</sup>

### 1990s: the Calman reforms

Formal recognition of the lack of both structure and assessment, not only in surgical training but in post-graduate medical training in general, emerged from the 1993 parliamentary working group report on specialist medical training in the UK entitled ‘Hospital Doctors: Training for the Future’.<sup>30</sup> This report led to the introduction of the eponymous Calman reforms, Sir Kenneth Calman being the Chief Medical Officer of England from 1991 to 1998. The main driver of change was the need to align UK law with EU law<sup>17,29</sup> and to standardize UK-based post-graduate medical training in general with that of the rest of Europe.

The Calman reforms had two main components: firstly, the restructuring of post-graduate specialist training by combining the old ‘Registrar’ and ‘Senior Registrar’ grades into the new ‘Specialist Registrar’ grade, and secondly, the introduction of defined entry points to training, with training time limited to the seven to nine years following primary medical qualification.<sup>29,30</sup> The Surgical Royal Colleges were tasked with providing curricula containing specific competency-based assessments that would demonstrate progression of training.<sup>29,30</sup> The concept of the Certificate of Completion of Specialist Training (CCST) was introduced as a means of defining the end point of training and receipt of the CCST from the General Medical Council on the advice of a Surgical Royal College would signify that the trainee had completed a training programme to a ‘standard compatible with independent practice.’<sup>29,31</sup> Of note, the influence of the Calman reforms only began when doctors had progressed from the Senior House Officer (SHO) grade to Specialist Registrar (SpR).

### Mid 1990s to early 2000s: the post-Calman years

In the early post-Calman era of the mid 1990s, concerns remained relating to the lack of both training structure and progression points for the many doctors in the early (SHO) stages of their post-graduate training.<sup>29,32</sup> A

consultation paper on medical training reform written in 2002 by Liam Donaldson, Chief Medical Officer, entitled ‘Unfinished Business’ highlighted the key issues.<sup>33</sup> Many SHOs were employed in short-term posts, without any formally recognized training value. A lack of clearly defined exit points meant many were ‘trapped’ at this level for up to ten years without the prospect of progression to Specialist Registrar level, this leading to the famous description of the post-Calman SHOs as the ‘lost tribe.’<sup>32,34</sup> Job satisfaction and morale were low, and an increasing workload burden with bias towards service provision led to them being viewed as the ‘workhorses’ of the NHS.<sup>15,33</sup> Many of the SHO grade doctors were non-UK graduates, initially attracted to the UK because of the prospect of entering the training system, but who subsequently became disillusioned not only because of the relatively mundane work but also because of the highly competitive nature of progression to specialist training. Five key principles relating to the reform of SHO training were contained within the conclusions of Unfinished Business: training should be programme-based, time-limited, broad-based, flexible, and tailored to the requirements of the individual.<sup>33,34</sup> The report suggested the introduction of a two year ‘Foundation Programme’ immediately following graduation from medical school leading to entry into eight or more broad-based basic specialist training programmes, before competitive entry into speciality Specialist Registrar schemes which, assuming satisfactory progress, would lead to the award of a CCST.<sup>33</sup>

Shortly after the release of Unfinished Business, a second consultation paper on medical training reform was published in 2003 entitled ‘Choice and Opportunity’.<sup>35</sup> This addressed mounting concerns about difficulties experienced by doctors in standalone non-training posts and those outside the formal training system without consultant or GP status, known collectively as Staff and Associate Specialist (SAS) doctors.<sup>36</sup> Many of these doctors had progressed from the SHO grade referred to above, and large numbers were non-UK graduates. The difficulties experienced included diverse role variation, the lack of a recognized career structure, and the lack of opportunities for career progression, described as ‘professional cul-de-sacs,’<sup>34,36</sup> and recognized as stigmata associated with “non-training” grade positions.<sup>34</sup> The Choice and Opportunity report provided recommendations to reform SAS medical careers using the principles of improving access to training and to continuous professional development, with the recognition of SAS posts as both valid and valued career choices.<sup>34,35</sup>

### Early 2000s: the gathering storm

New political and legislative factors influenced the need for training reform in the late 1990s and early 2000s, the so-called ‘gathering storm.’<sup>34</sup> Central to this was the

change in public expectation which now demanded a consultant delivered healthcare model. This was detailed in the 2000 NHS Plan,<sup>37</sup> which required an increase in the output of trainees from speciality training schemes, and inevitably led to pressure being applied to reduce the duration of training.<sup>34</sup> As a result of the drive towards workforce self-sufficiency, medical school numbers increased by 60% between 1999 and 2005, with an increase in the proportion of female students being a notable feature.<sup>34</sup>

Complicating this landscape were the new restrictions on trainee surgeons' working hours, which further served to constrain training time. Doctors' work hours were capped at 56 hours per week in 1991, as a result of the 'New Deal'.<sup>38</sup> Minimum rest periods between shifts were enforced in recognition of public and professional demand amid mounting evidence relating to the negative effects of sleep deprivation and unnatural circadian rhythms.<sup>6</sup> The risk to personal health, cognitive and motor impairment,<sup>39,40</sup> and the associated increased risk of clinical errors and injuries<sup>41</sup> meant there was potential for serious patient harm as a result of surgical trainee fatigue.<sup>42</sup>

Doctors' working hours were reduced even further with the introduction of the European Working Time Directive (EWTB). This became law in 1993 but the medical profession, along with several others, were initially excluded.<sup>41</sup> In 2004 this exclusion was removed as part of a planned, phased inclusion of formerly exempt workers by the European Commission and Parliament.<sup>41</sup> In 2004 doctors' working hours were limited to 58 per week and subsequently, in 2009, to 48 per week. The EWTB imposed additional restrictions relating to compulsory rest and rota design that were more stringent than those of the New Deal, including the requirement for 11 hours continuous rest in each 24-hour period.<sup>41</sup>

Concerns began to be raised about how training could be effectively delivered within such greatly reduced hours, and studies during the transition period showed that time spent by trainees in the operating theatre and outpatient clinic – the two principal surgical training environments – was significantly reduced within a EWTB-compliant rota system when compared to a traditional on-call rota.<sup>6,43</sup>

As a result of a restructure of financial accountability relating to healthcare delivery, unprecedented financial strain was experienced by the NHS in 2004 to 2005, leading to widespread financial deficits, with pressure being applied to all parts of the organization to reduce spending.<sup>34</sup> The creation of National Training Levies in 1996 had meant that post-graduate education budgets had been safely ring-fenced from spending cuts, but this protection was removed by the Department of Health in 2006 in the midst of the austerity measures,<sup>34</sup> and many Strategic Health Authorities capitalized on their new freedom to reduce their commitment to education and

training funding. Major changes in the funding structure of the NHS also occurred in the early 2000s, including significant reductions in the number of Strategic Health Authorities (SHAs) and Primary Care Trusts (PCTs), which had a temporary destabilizing effect on NHS organizations and provided a further distraction from the ongoing issues related to post-graduate training.<sup>34</sup>

The Post-graduate Medical Education and Training Board (PMETB), a non-governmental public body responsible for post-graduate medical training,<sup>36</sup> was created in 2003 and began work in 2005<sup>34</sup> as an independent statutory body with overall responsibility for regulating post-graduate medical education and training, within a single framework.<sup>44</sup> This was part of a wider effort to make professional regulation more centralized and accountable, the stimulus in part being a consequence of a number of high-profile 'self-regulatory' failings including the Bristol Royal Infirmary and Alder Hey debacles.<sup>34</sup> The PMETB had now taken over the responsibility of regulating training from the specialist training authorities of the individual Royal Colleges, a significant move.<sup>44</sup>

### 2003 to 2007: Modernising Medical Careers

In 2003 the Health Departments of the four home nations released a joint policy statement entitled 'Modernising Medical Careers' (MMC).<sup>45</sup> This outlined the principles of an ambitious and major reform of post-graduate training, driven by the issues referred to above. The key features of the reform were the abolition of the SHO grade, the creation of the Foundation Programme (compulsory two-year broad-based training for all medical graduates),<sup>46</sup> and, most significantly, the streamlining of specialist training.

A UK Strategy Group was formed in late 2003 by Sir Liam Donaldson to deliver the MMC reforms, leading to the publication in 2004 of 'MMC: The next steps – The future shape of Foundation, Specialist and General Practice Training Programmes'.<sup>47</sup> The report outlined the most dramatic overhauling of the structure of medical education since the foundation of the NHS in 1948.

A crucial feature of the MMC reforms was the introduction of a single, post-graduate specialist training track with the potential for run-through training that had the effect of removing the competitive nature of the transition between training grades which had contributed to the 'lost tribe' and SAS grade problems. The two pre-existing training phases were now combined into a 'seamless training process that would lead directly to the award of CCST (assuming satisfactory progress), without additional competitive entry'.<sup>47</sup> The main principles of the new system were set out as the 'Seven Pillars of MMC',<sup>34</sup> these being that training should be 'trainee-centred, competency assessed, service-based, quality assured, flexible, coached and streamlined'.



In 2007, the MMC programme was fully deployed and all doctors in training (post-foundation years) were required to apply for training positions using the newly formed centralized recruitment system: the Medical Training Application Service (MTAS). Serious early problems with MTAS emerged relating, in particular, to major flaws in the shortlisting process and software failures leading to confidential data security breaches.<sup>34</sup>

MTAS also led to a substantial excess of applicants owing to a failure to restrict applications from the non-European Economic Area (EEA). In the ensuing chaos, many highly qualified and experienced junior doctors failed to receive interview offers, and their future careers were left in doubt.<sup>34</sup> The BMA described ‘top juniors flung on the scrapheaps after a decade of training’<sup>34</sup> and stated that the leaders of the medical profession were ‘hand-maidens to their own apocalypse’.<sup>34</sup> There was total ‘collapse in confidence’<sup>34</sup> in the recruitment and selection process and there followed heated public demonstrations by junior doctors<sup>48</sup> and a series of high-profile resignations, including the head of MMC, Alan Crockard.<sup>34</sup>

An emergency review group was tasked with making urgent reform mid-way through the recruitment process, the unpopular results of which were subsequently challenged, albeit without success, in a High Court judicial review<sup>49</sup> sought by Cure UK, a now defunct junior doctors’ action group.<sup>34,49</sup> Several more high-profile resignations of senior figures involved in MMC followed,<sup>50</sup> and a series of emergency ministerial statements were issued to address concerns about the viability of MMC and the post-graduate training environment as a whole.<sup>34</sup>

The events of 2007 are now widely considered to have been damaging for both junior doctors and the reputation of post-graduate training, and was highly embarrassing for the government.<sup>34</sup> As a consequence of the MTAS fiasco, an independent inquiry into the events of 2007 was led by Professor Sir John Tooke, the final report being published in 2008.<sup>51</sup> The inquiry found that the 2007 post-graduate training crisis had occurred for several reasons relating in particular to poor policy objectives, weak governance structure, inadequate project management, and leadership deficiencies in both the medical profession and Department of Health.<sup>34</sup> Ineffective workforce planning for the new streamlined training structure further compounded the problems.<sup>34</sup>

The Tooke inquiry resulted in 47 recommendations for reform to post-graduate medical education. It called for a more ‘flexible and broad based approach to training, integrating both training and service into workforce planning’.<sup>51</sup> These recommendations, crucially, included key structural training reforms which directly opposed the two key changes made by MMC: splitting the Foundation Programme, and uncoupling basic and higher specialist training at registrar level. A new training body was also

proposed – NHS Medical Education England (NHS:MEE) to act as the ‘policy interface between development and interface on matters related to post-graduate medical education and training’ and as principle budget holder for post-graduate training.<sup>51,52</sup>

The response to the Tooke report from the Royal College of Surgeons,<sup>53,54</sup> the BMA, NHS Employers, and doctors themselves was overwhelmingly positive.<sup>34,55</sup> The Department of Health welcomed the report and declared it a ‘significant step forward’ in addressing the ongoing issues with post-graduate training following the 2007 fiasco.<sup>34</sup>

### 2009 to 2015: the post-MMC, ‘Shape-of-Training’ climate

After 2007, post-graduate orthopaedic recruitment and training continued in a precarious state of equilibrium. At completion of foundation training, and following a competitive process, trainees were appointed to ‘Core’ surgical training posts for two years (with the training years called ‘CT1’ and ‘CT2’ respectively). During CT2, trainees would pass through a further process of open, competitive national selection into the higher specialist training schemes, beginning at the ‘ST3’ year. Once appointed into an ST3 post with a National Training Number (NTN), trainees would progress through training for a total of six years leading to the award of what from 2010 had become the Certificate of Completion of Training (CCT) at the end of ST8.

Having embarked upon an “uncoupled” training structure, the debate about whether there should be a role for run-through training continued. Many deaneries were given the opportunity to offer ‘mixed-economy’ entry through a “pilot” scheme, allowing a quota of MMC-style ‘run-through’ specialist training posts, but with the majority of trainees being appointed to the new uncoupled style posts. This pilot was short-lived and did not progress to meaningful evaluation, but the seed for its later re-emergence had been sown. The mixed-economy structure had attracted early criticism that uncoupled trainees would be unfairly disadvantaged,<sup>56</sup> but it was recognized that if the applicants with the best potential for progressing successfully through the training system could be appointed early, the concept had merits.

The Shape of Training Review (SoTR), led by economist Professor David Greenaway, was published in 2013 with the aim of establishing how post-graduate training could be improved to meet the projected needs of patients and service providers over the next 30 years, taking into account lessons learnt from MMC.<sup>57</sup> The review made 19 recommendations for change.<sup>58</sup>

The report found that modern post-graduate curricula require ‘demonstration of knowledge, skills and abilities through measurable and observable assessments’.<sup>58</sup> It stated that there was an over-reliance on time in service as

evidence of progression. This emphasis is demonstrated by the Annual Review of Competency Progression (ARCP) process, where trainee surgeons' progress relative to the curriculum is measured on a yearly basis, and a summative decision is made on whether to allow progression to the next year of training or alternatively to implement some form of remediation. Time in training was therefore being used as a 'proxy' measure of competence.<sup>58</sup> The SoTR recognized that training must 'continue to be bound by the timeframe of the training programmes' and that extending training 'will not necessarily lead to better trained doctors',<sup>58</sup> but that training progress should be according to competencies and capabilities, and hence 'more bespoke to the individual.' It was acknowledged that this might cause tension between 'service continuity, delivery and training' but that 'ultimately, it will give patients, doctors, trainers and employers more assurance that they have met the necessary requirements to work safely and competently with appropriate supervision.'<sup>58</sup>

The report summarized the findings of the review as a 'wide recognition of the need for change' and a 'clear consensus about what change should deliver: greater flexibility, better preparation for working in multi-professional teams and more generalists.'<sup>58</sup>

In late 2013 Health ministers convened a UK-wide steering group (UK Shape of training group – the UKSTSG) to oversee implementation activity arising from the SoTR<sup>57</sup> and to undertake a detailed economic analysis of the proposed changes. A pan-collegiate curriculum mapping review exercise was undertaken, to determine timescales for moving towards a more competency-based training structure and to begin the transition to broad-based early training. The curriculum review exercise also sought to establish how future curricula should be quality-assured and regulated (currently post-graduate curricula are updated by the respective Royal College and approved by the GMC who acts as the UK Regulator on all matters related to post-graduate training, since absorbing PMETB in 2010).<sup>57</sup> The considerable challenge faced by UKSTSG was how to apply these broad concepts in practice 'given the complexity of medical education and training and the parameters within which it was required to work.'<sup>57</sup> The British Orthopaedic Association (BOA) issued an early position statement setting out the potential implications of these in Trauma & Orthopaedics.<sup>59</sup> Although welcoming most of the report, the BOA highlighted the apparent conflict between the recommendation that consultants should retain broad-based competencies, and the existence of 'compelling evidence that surgical outcomes and patient safety are optimised when care is more specialised.'<sup>59</sup> It also cautioned against fully devolving training governance to local bodies, as it was felt that national oversight was necessary to ensure that standards across the full range of general and subspecialty care were maintained, and to optimize workforce

planning. The BOA expressed interest in contributing to the UK-wide delivery group for implementing the SoTR recommendations as the self-identified appropriate organization to shape training in T&O, and to respond to the future needs of patients and employers.

Alongside the early output of the UKSTSG in 2013 to 2015, the four Nations Statutory Education Bodies (SEBs) published their strategic plans for the future configuration and delivery of health services.<sup>57,60,61</sup> While somewhat changing the service delivery landscape from that envisaged in the SoTR release,<sup>57</sup> it was immediately clear that these plans shared several common themes including the need for greater flexibility in medical training and broad-based practice, and thus could be implemented in tandem as collaborative ventures.<sup>57</sup>

### 2015 to 2020: improving surgical training initiative

The GMC took over the role of training regulator in 2010, this having previously been the responsibility of the PMETB. The profile of Quality Assurance became elevated with the advent of the GMC trainee survey, and as a result it became apparent that there remained considerable dissatisfaction at Core training level relating in particular to high service demands, access to training opportunities in theatre, and access to formal teaching programmes. This, together with the recommendations of SoTR that fed into the developing curriculum reconfigurations, and an appreciation of a decline in application numbers to Core surgical training, led to a further review of early years training. In 2015, this culminated in the publication of the 'Improving Surgical Training' initiative,<sup>62</sup> a joint pilot venture between The Royal College of Surgeons of England, Health Education England (HEE), and UKSTG. Although the GMC has recently taken over much of the role, the pilot was overseen initially by the Joint Committee on Surgical Training (JCST), an independent advisory body that works on behalf of the four Surgical Royal Colleges of the UK on all matters related to surgical training.<sup>57,63</sup> The IST pilot initiative aims to 'create an improved surgical training system that produces competent professionals who are able to provide the highest quality of care to patients in the NHS.'<sup>11</sup> The key aims are firstly to provide trainee surgeons with an appropriate balance between service and training, secondly to support trainers and protect training time, thirdly to deliver a curriculum that is truly competency-based within a learning environment that embeds and enhances simulation, and lastly to ensure that the existing end-of-training product will continue to meet current and future patient needs. The first cohort of IST trainees commenced training in General Surgery in August 2018, with Urology and Vascular Surgery following in 2019. Although run-through training is just one component of IST, it is being assessed separately given its high profile, with other

components assessed together as a separate focus of the pilot. The future direction of IST is unclear, but it is not envisaged that entry at ST1 will become the norm, merely an option with a mixed economy entry being the preference of the T&O SAC, the Speciality Advisory body that is accountable to the JCST.

The potential benefits of IST are wide-ranging. For patients, their surgeons will be trained to deliver the highest standards of care with continuity, while retaining access to subspecialist expertise where appropriate. For trainee surgeons, training quality should improve, with focus provided by professional trainers, a reduction in duties of low educational value, and improved relationships with trainers.<sup>11</sup>

A 2015 joint statement by the British Orthopaedic Trainees Association (BOTA) and the Association for Surgeons in Training (ASiT) expressed support for IST in principle, however several concerns were raised relating, in particular, to the feasibility of implementing run-through style training on a large scale. During the IST consultation process, the T&O SAC along with the BOA were supportive of the principle but felt more comfortable with a delayed entry into the pilot. The first IST trainees in T&O were appointed in 2020 and the results of the pilot are awaited with interest.

The future role of IST is unclear. HEE released a statement in July 2019 saying that the IST pilot will expand to include 75% of core surgery posts by 2021 and 100% by 2022, and while this is unlikely to be seen, it is not the desired direction for either the T&O SAC or for many other surgical specialties, a mixed economy of entry being more attractive. The current position of the T&O SAC at the time of writing is that IST offers some attractive innovations but advice regarding its potential future role should be based on the results of the pilot assessment.

In response to HEE's announcement, ASiT and BOTA released a joint position statement in July 2019 in which concerns were expressed relating to the delay in the independent review process, the potentially inadequate resourcing for the roll-out of IST, and the apparent dilution of the original objectives.<sup>64</sup> The status of the pilot was questioned and it was felt that premature expansion may be to the detriment of surgical training programmes.<sup>64</sup>

Concern was also expressed relating to some of the early trainee feedback. Of the first intake of IST trainees, 53% reported dissatisfaction in the balance between service provision and training, and only 42% of trainees reported receiving protected/structured teaching from a consultant trainer once a month or less, suggesting that two of the central principles of the IST programme were not being met for the first cohort. Concerns were also raised at the finding that time for teaching is set to be reduced by half and more anti-social hours work permitted, suggesting that the 'original objectives and scope of the IST programme have been reduced in both

scale and ambition.'<sup>64</sup> The position statement concludes with an expression of concern that the 'rushed expansion' represents a 'rebranding of early years surgical training without meaningful improvements in the delivery of training or the training environment' and that 'a once-in-a-generation opportunity to transform surgical training and prioritize training over service is being missed.'<sup>64</sup>

ASiT and BOTA have requested that the planned expansion of the IST programme be halted until the success of the pilot has been reviewed and reported. They have also requested that stakeholders be given a role in future decision-making and planning, and that annual 'waypoint reviews' of the pilot be implemented and shared with all stakeholders including surgical colleges. This will facilitate transparency and enable the 'objectives and scope of IST to be critiqued and amended as necessary' so that IST 'delivers tangible improvements in the quality of surgical training.'<sup>64</sup> T&O is fortunate in following other surgical specialties into the IST pilot, and it is hoped that the problems others encounter will serve as an incentive to modify and improve a process that undoubtedly has many attributes.

### 2021: the new T&O curriculum

Running in parallel with IST has been the development of the new T&O curriculum, initially intended for implementation in August 2020, but delayed for twelve months because of COVID-19. Given that changes naturally occur in any healthcare system it is vital that training maintains its relevance by reflecting those changes; the curriculum should never be seen as a static document. Driven by the GMC report Excellence by Design,<sup>65</sup> the new curriculum standards form the basis of the changes. The standards now focus on the generic skills required to be a safe, effective day-1 consultant, capable of independently managing an unselected emergency take but also able to develop a subspecialty interest.<sup>13</sup> The key features of the reforms are shown in Figure 2.

**Progress will be truly capability-based.** Moving from the traditional time-based training framework to a capability-based system is a radical change. The endpoint of training will be when trainees have reached the level expected of a day-1 consultant. There will still be indicative times during which the great majority of trainees will be expected to complete training, but progress can be more rapid if the required capabilities are clearly demonstrated at an earlier stage.<sup>12</sup>

The framework upon which all assessments will be based relates to nine Generic Professional Capabilities (GPCs) that are fundamental to Excellence by Design, such as Professional Knowledge and Capabilities in Leadership and Team Working. The assessments relate to the way in which the Capabilities translate into the workplace and are referred to as Capabilities in Practice (CiPs), these being common to all surgical specialties. Examples

<b>Generic Professional Capabilities (GPCs)</b>	<ul style="list-style-type: none"> <li>• Developed by the GMC and Academy of Medical Royal Colleges</li> <li>• Describe the interdependent essential capabilities that underpin professional medical practice in the UK</li> <li>• 9 pan-specialty theme areas</li> <li>• Serve as educational outcomes in their own right, carrying equal weight to the CiPs</li> <li>• Professional, high level, holistic assessment framework</li> </ul>
<b>Capabilities in Practice (CiPs)</b>	<ul style="list-style-type: none"> <li>• Set against standard expected of day 1 consultant</li> <li>• Replace the syllabus as the main focus of assessment</li> <li>• High level generic and specialty specific areas</li> <li>• 5 CiPs for T&amp;O; outpatients, inpatients, emergency take, theatre list and multi-disciplinary working</li> </ul>
<b>Multiple Consultant Report (MCR)</b>	<ul style="list-style-type: none"> <li>• Takes place at mid-point and end-point of each placement and feeds into learning agreement.</li> <li>• Holistic professional judgement of trainees' performance against GPCs and CiPs</li> <li>• Focussed, tailored and timely feedback against the outcomes of training</li> </ul>

Fig. 2

Key features of the new Trauma and Orthopaedic (T&O) curriculum. GMC, General Medical Council.

of the nine CiPs include managing an outpatient clinic, managing the unselected emergency take, and managing an operating list. Each CiP covers everything required of a day-1 consultant to undertake the role safely and effectively, and progress against the CiPs is stratified by the familiar required supervision levels, with level 1 being the ability to observe, progressing to level 4, which is indicative of having reached the curriculum standard. There is however an additional option of an outcome 5, which signifies performance beyond the level of a day-1 consultant, this type of recognition of excellence being a desired feature of the new curriculum.<sup>12</sup>

The GPCs, which give equal weighting to clinical knowledge and technical skills,<sup>66</sup> have three core domains: professional values and behaviour, professional skills, and professional knowledge. These are embedded within the new curriculum, and serve the primary purpose of ensuring that professional development proceeds at an appropriate pace alongside the development of clinical skills.<sup>66</sup>

**Training will be arranged in phases.** Surgical training will be arranged into three phases, with each phase having a summative assessment 'gateway' before progression is allowed. The outcome of phase 1 is to gain the competencies described in the core surgical training curriculum; for T&O the indicative length of this phase is two years. The outcome of phase 2 is the gathering of sufficient knowledge and experience in the breadth of T&O, including the emergency take, and to develop GPCs to the level of a day-1 consultant. The indicative length of phase 2 in T&O is four years, completion of which corresponds approximately to the end of the current ST6 (year). Trainees reaching the end of phase 2 will be eligible to apply for the Fellowship examination. The outcome of phase 3 is the development of technical skills to the level

of a day-1 consultant; the indicative length of phase 3 is two years. Trainees demonstrating these capabilities will be awarded an Outcome 6 at ARCP and be recommended for CCT.<sup>12</sup>

**Assessments in training will change.** The syllabus itself remains largely unchanged in terms of clinical content, but the methods of assessment will be notably different. There will be a new inventory of assessments in training, with which the trainers and trainees must familiarize themselves during the transition period.<sup>13</sup> Central to these is the Multi-Consultant Report (MCR) which, together with other assessments, informs the ARCP outcome<sup>12</sup> primarily through the AES report. Key to the MCR is the concept of 'entrustability',<sup>67</sup> measured by the aforementioned supervision levels against the CiPs. Reduced emphasis will be placed on the current range of workplace-based assessments (WBAs) within the summative assessment process but these will remain important as part of formative learning. Mandatory numeric thresholds for WBA completion will be removed from assessment under the new curriculum, but it is thought that for most trainees, training progression will be demonstrated by the acquisition of a broadly familiar range and number of WBAs.<sup>13</sup>

### Looking ahead

The post-graduate training system ultimately exists to serve the needs of patients. With the projected fastest population growth expected to be in those over 85 years of age<sup>68</sup> (the number of whom are expected to double in the next 25 years)<sup>69</sup> the demand for orthopaedic surgery is only set to grow further and we have a responsibility to ensure that care delivery is of the highest possible standard.

To continue to produce high-quality day-1 consultants who best serve our patients' needs, we must ensure that



we continue to attract the best applicants into training and must ensure that that the diversity of our patients is reflected in that of the workforce.<sup>70</sup> T&O has long been criticised for lacking diversity, particularly of gender,<sup>71,72</sup> with only 6.7% of current orthopaedic consultants being women,<sup>73</sup> despite women representing the majority of medical school entrants.<sup>74</sup> The importance of the identification and removal of barriers to women, and indeed all under-represented groups, in choosing<sup>75</sup> and succeeding<sup>76,77</sup> in T&O, has been recognized by the BOA and is reflected in the recent publication of its Diversity and Inclusion Strategy.<sup>77</sup> It is only with the sustained implementation of this strategy can we expect our speciality to achieve its potential.

Future training reform will need to serve the needs of both a growing ageing population and an increasingly diverse workforce. This will require less-than-full-time training and atypical training trajectories to become more common and better accommodated, and the traditional image of the white, male, full-time consultant T&O surgeon will need to change. The challenge of addressing the 'leaky pipeline' of women from surgical careers<sup>78</sup> represents just one example of what lies ahead.

The orthopaedic training programme of the future will inevitably place a greater emphasis on objectively demonstrable technical competence. Simulation will have a more prominent role, and its use, while currently neither mandatory nor universally provided,<sup>79</sup> will become more commonplace and accepted as vital. This will naturally require development of the burgeoning evidence base for the effectiveness of simulation for surgical training.<sup>80</sup>

In conclusion, the forthcoming curriculum changes represent an exciting new frontier in T&O training. A truly outcome-based system should ensure standards are maintained while being trainee-centred, flexible, and creatively mitigating the known challenges resulting from the modern training environment. It is clear that T&O training has evolved in recent decades and there is no reason to expect that future change will not be necessary. We are fortunate in having the increasing potential to use a wide range of evidence on which to base those changes, but ultimately we must not lose sight of the fact that the focus of change must be the patient.

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