



Contents lists available at ScienceDirect

# The American Journal of Surgery

journal homepage: [www.americanjournalofsurgery.com](http://www.americanjournalofsurgery.com)

## Educational interventions aimed at the transition from surgical training to surgical practice

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### ARTICLE INFO

#### Article history:

Received 13 September 2018

Accepted 14 September 2018

#### Keywords:

Readiness for surgical practice

Transition to surgical practice

Preparedness for surgical practice

Assessment of surgical knowledge and skills

Mentorship

Preceptorship

Coaching

### ABSTRACT

The transition from surgical training to surgical practice is a critical juncture in the career progression of surgeons. This period is associated with myriad challenges that need to be addressed through specific educational interventions to ensure delivery of safe care to patients and to support the career aspirations of junior surgeons entering the practice environment. These interventions should be based on principles of contemporary surgical education and training, and focus on the needs of surgery residents and junior surgeons entering practice. The specific systems of patient care in which the junior surgeons will work should also be considered while planning and implementing such educational interventions. Senior surgeon colleagues within these systems should play key roles in supporting the junior surgeons entering practice, and may require special training to serve as effective mentors, preceptors, and coaches. Professional societies should play a key role in establishing national standards regarding the educational programs aimed at this transition and develop programs to complement local efforts to address various needs. The American College of Surgeons Division of Education has developed a spectrum of innovative programs that are aimed at this important transition.

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### Introduction

Monumental changes in the milieu of health care delivery, new regulations aimed at surgical practice and surgical training, advances in the management of surgical conditions, and increasing demands on surgery faculty have all impacted the preparation of surgery residents for surgical practice.<sup>1</sup> Concerns regarding the competence and confidence of graduating surgery residents and their readiness for surgical practice are widespread. A number of studies have yielded important data that have highlighted a variety of problems that require attention. Insufficient experiences with operations considered essential by surgery program directors or through national consensus have been documented.<sup>2,3</sup> The lack of readiness of surgery residents to independently perform procedures considered to be core within surgical training has also been demonstrated.<sup>4</sup> Surgery specialty fellowship program directors have reported major deficiencies in the technical and patient management skills of individuals entering fellowship training after graduating from general surgery residency programs.<sup>5</sup> A survey of these fellowship program directors revealed major problems with

the skills of individuals entering fellowship training. These included inability of entering fellows to operate independently and recognize early signs of complications, as well as their lack of familiarity with therapeutic options, and problems relating to patient ownership. In addition, a survey of Members of the American College of Surgeons (ACS) was conducted by the ACS Board of Governors and ACS Young Fellows Association, in collaboration with the ACS Division of Education to obtain information regarding the readiness of surgery residents for practice.<sup>6</sup> Surveys were developed for “older surgeons” (greater than 45 years of age) and for “young surgeons” (45 years of age or younger). Notable differences were found in the perceptions of “older surgeons” and “young surgeons.” Only 59% of the “older surgeons” strongly agreed or agreed that individuals entering practice were adequately trained to transition to the surgery attending role. Also, 79% of “older surgeons” agreed that participation in a transition to practice program would be beneficial to the junior surgeons entering practice. In contrast, more than 90% of the “young surgeons” strongly agreed or agreed that they had adequate training to transition to the surgery attending role. Also, only 48% of “young surgeons” expressed interest in a transition to practice program. The differences between the perceptions of the senior and junior surgeons are striking and underscore the need to bridge these gaps

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to ensure a smooth transition from surgical training to surgical practice. Special efforts should be directed at developing educational standards; designing and implementing novel educational interventions; and collecting data from national experiences relating to this important transition.

### **Educational interventions aimed at the transition from surgical training to surgical practice**

Major national efforts have been undertaken during the past 15 years to reform surgery residency education and training.<sup>7</sup> Several professional organizations have played pivotal roles in this regard. The Surgical Council on Resident Education (SCORE) has been established and involves key national organizations engaged in surgery resident training. This collaboration has resulted in the development and dissemination of the SCORE curriculum that is widely used by surgery residency training programs. The American Board of Surgery (ABS) is currently engaged in defining and developing Entrustable Professional Activities (EPAs) for surgical training to support competency-based training and advancement of surgery residents. Also, the ABS and the Review Committee for Surgery (RC) have developed specific milestones to support progression of residents from one level to the next. In addition, several residency programs are pursuing efforts to address issues relating to provision of sufficient autonomy to surgery residents to better prepare the residents for surgical practice.<sup>8–10</sup>

The ACS Division of Education has been pursuing multi-faceted strategies to address various challenges relating to the transition from surgical training to surgical practice. The overarching approach of the division has been founded on the philosophy that preparation for practice needs to begin at the start of residency training and must continue through the duration of residency training and into practice. A range of standard-setting education and training programs have been developed by the ACS Division of Education, and these programs have been well received by both surgery residents and surgery program directors across the country. A few of these programs are highlighted below.

The *ACS Fundamentals of Surgery*<sup>®</sup> (*ACS FSC*) Program was developed over a period of several years and launched in 2008. It was awarded a Patent by the U.S. Patent and Trademark Office for the Interactive Education System and Method in 2013. *ACS FSC* is a highly innovative curriculum and state-of-the-art simulations are used to address cognitive skills of residents entering residency training. The Program currently includes 108 case scenarios within the following 14 essential content areas: preoperative assessment; on-call issues; pain management; unresponsive patients and agitated patients; respiratory management; gastrointestinal conditions; wound management; nutritional support; fluid and electrolyte management; cardiac conditions; vascular conditions; cardiothoracic conditions; oncology; and patient and workplace safety. Over 1500 residents from 220 programs in general surgery and from a number of other surgical specialties are currently enrolled in *ACS FSC*. Post-tests have recently been added to the 14 modules to provide surgery program directors helpful data relating to the cognitive skills of individual residents. A companion program, *ACS Entering Resident Readiness Assessment (ACS ERRA)*, focuses on formal assessment of cognitive skills of the entering surgery residents and was launched in Summer 2018 following development and extensive pilot-testing that spanned a few years. *ACS ERRA* will be offered annually to surgery training programs to formally assess the cognitive skills of entering surgery residents using the psychometrically rigorous “key features” approach that has been described in the literature.<sup>11</sup> *ACS ERRA* includes 40 short clinical cases within 20 clinical topics that are followed by questions to assess problem-solving skills relating to approximately 100

critical patient assessment and management decisions that entering surgery residents are likely to encounter. The content of *ACS ERRA* is based on the content outline of *ACS FSC*. The latter is aimed at teaching and learning and the former at formal assessment of cognitive skills of entering surgery residents; thus, the two are complementary. In 2018, over 600 residents from 63 programs were enrolled in *ACS ERRA* and early experiences with this program have been very positive. Reports from the assessments of surgery residents have been shared with the respective program directors along with comparative data from other residency programs. Program directors can use this information to develop specific learning plans in close collaboration with individual residents to address any gaps that are identified.

A third program of the ACS Division of Education that focuses on entering surgery residents is the *ACS Surgery Resident Objective Structured Clinical Examination (OSCE)*.<sup>12</sup> This program is aimed at assessing the clinical skills of entering surgery residents using a performance-based approach and focuses specifically on patient safety. The *ACS Surgery Resident OSCE* was developed through major grant support from the Agency for Healthcare Research and Quality. Assessment tools and educational resources are available to help surgery residency programs implement the OSCE. Plans to remediate gaps in clinical performance can be readily developed based on the results of performance on the OSCE. The fourth program that focuses on entering surgery residents is the *ACS/APDS Surgery Resident Skills Curriculum*.<sup>13</sup> This curriculum is aimed at the technical skills of surgery residents and was launched in three phases. The first phase addresses the needs of entering surgery residents and includes 16 modules that focus on basic skills and tasks. The Phase I modules were recently revised and assessment tools were added to permit valid and reliable assessments of proficiency through use of Objective Structured Assessment of Technical Skills (OSATS). The Phase II modules are aimed at the more senior residents and focus on complete procedures. Plans are underway to revise the 15 modules in this category and incorporate use of state-of-the-art simulators to achieve specific learning objectives. The Phase III curriculum includes 10 modules that focus on team-based skills and these are currently being revised and updated. Also, assessments will be added soon to these Phase III modules.

In addition to the aforementioned efforts, in 2005, the ACS Division of Education established an innovative program to accredit simulation centers.<sup>14</sup> These accredited simulation centers are designated ACS-accredited Education Institutes (ACS-AEIs) in view of the broad scope of their activities. Programs offered at ACS-AEIs address both technical and non-technical skills, and are aimed at practicing surgeons, surgery residents, and surgical teams. The ACS-AEIs also focus on systems of care in different settings, such as emergency departments, intensive care units, and inpatient and outpatient units. Currently, there are 93 ACS-AEIs with 80 ACS-AEIs in the U.S., four in Canada, and nine in countries beyond North America. A Consortium of ACS-AEIs has been created to exchange valuable information from the experiences of individual ACS-AEIs, design and implement state-of-the-art simulation-based training and assessment programs, and establish new national and international benchmarks. Also, collaborative research is being pursued by the ACS-AEI Consortium to advance the field of simulation-based surgical training.

The ACS Division of Education has also offered a brief program, “ACS Surgery Resident Program: Starting Surgical Practice – Essentials for Success” during the Annual ACS Clinical Congress. This program has focused on non-clinical topics that are generally not covered well during residency training. Topics have included job seeking strategies, negotiation skills, contracts, reduction of liability risk, and financial planning. In 2018, this program will be linked with the resident program of the ACS Resident and Associate

Society to offer an integrated experience to residents at the Clinical Congress. Further, the ACS Division of Education offers an annual *ACS Residents as Teachers and Leaders* Course, which has entered its thirteenth year and remains oversubscribed. This course focuses on the fundamental knowledge and skills relating to teaching and leading in surgery.

In 2012, the ACS Division of Education in collaboration with the Accreditation Council for Graduate Medical Education (ACGME) organized a National Consensus Conference on Transition to Practice in Surgery.<sup>15</sup> The goal of this conference was to discuss issues relating to the transition from surgical training to surgical practice and to develop specific strategies to harness myriad opportunities across the surgical specialties. Representatives from the respective certifying boards, review committees, program director organizations, academies and professional societies, and other key stakeholders from across the house of surgery were invited to attend. Sixty-five individuals participated in the conference and the discussions were very productive. They resulted in definition of important strategies aimed at both surgery residents as well as junior surgeons entering practice.<sup>15</sup> Recommendations aimed at surgery residents included redesign of surgery residency training model; interventions to prepare chief residents for independent practice; and evaluation and verification of knowledge and skills of residents before graduation. Recommendations aimed at junior surgeons entering practice included evaluation and verification of knowledge and skills of the junior surgeons; mentoring, precepting, and proctoring of these individuals; use of new technologies including telementoring, teleprecepting, and teleproctoring; and solutions to regulatory and legal challenges, credentialing and privileging, and financial considerations. The recommendations from this conference are being used to develop a host of new programs under the aegis of the ACS Division of Education.

An outcome of this National Conference was the development and establishment of the ACS Transition to Practice (TTP) Program. A Steering Committee was appointed following approval by the ACS Board of Regents and was charged with the responsibility of developing the model for the TTP Program and defining requirements for approval of sites that would offer this program. The unique features of the TTP Program are the availability of training opportunities in a variety of surgical settings, including academic health centers and community-based practices, and individualized experiences that address the specific career goals of the junior surgeons.<sup>16</sup> This one-year experience includes an intake assessment, periodic feedback and monitoring of progress, and a summative assessment focusing on the achievement of individual goals at the completion of the program. Junior surgeons enrolled in this program are called TTP Associates and not Fellows to underscore the different and higher level experience. The TTP Program involves strong mentorship and preceptorship for the TTP Associates in various practice environments.

Following pilot-testing in 2013, the TTP Program was launched in 2014. Currently, there are 36 approved TTP sites, including several sites in community settings. Fifty-one TTP Associates have completed this program. The experiences of the TTP Associates have been diverse given their specific career goals. The average number of cases performed by TTP Associates is 354, with a broad range of case numbers based on individual experiences and career aspirations of the TTP Associates. An important outcome has been the recruitment of 15 TTP Associates by the institutions where they served as associates. This is very encouraging and speaks to the success of the program. Future directions of this program include rebranding of the program as “Mastery in General Surgery.” This program will include advanced training in general surgery and will continue to focus on providing sufficient autonomy to the TTP

Associates. Also, special emphasis will be placed on practice management, business skills, negotiation skills, risk management, quality improvement, and organizational leadership.

In addition, ACS hosts an annual invitational conference on surgery residency training involving all surgical specialties. Leaders from the respective certifying boards, review committees, academies and professional societies, and program director organizations from across the surgical specialties along with representatives from the ACGME are invited to the ACS Headquarters to discuss critical topics in surgery residency training, exchange ideas, and learn about innovative approaches being designed and adopted by various surgical specialties. During this conference, small groups of attendees from the different specialties take a deep dive into timely topics. Recent topics addressed during this conference have included resident assessment, residency program evaluation, and resident autonomy. Also, a small group of leaders from the ACS, ABS, ACGME, RC, Association of Program Directors in Surgery, and American Surgical Association has been convened to focus specifically on residency training in general surgery. This group meets annually around the time of the larger cross-specialty conference highlighted above and on conference calls every quarter. Topics being addressed by this general surgery leadership group include boot camps; core training and competency-based education; ongoing progressive self-assessment and feedback; resident autonomy and appropriate supervision; community rotations and continuity of care; faculty development and support; career-long record keeping; public education and federal regulations; role of surgeons in surveying surgery residency training programs; and resident duty hours. Each national organization involved with this endeavor has taken the lead to address one or more of these topics.

There are a number of other innovative programs currently being developed by the ACS Division of Education to address additional needs relating to the transition from surgical training to surgical practice. Efforts are also being made to develop new models for mentoring, precepting, and coaching. These programs should be very helpful in addressing the current and future needs of surgery residents and junior surgeons entering practice.

### Concluding remarks

The transition from surgical training to surgical practice needs to be supported through effective educational interventions. ACS Division of Education continues to play a key national leadership role in resident education and training, and a spectrum of innovative education and training programs have been developed to address the specific needs of residents and junior surgeons entering practice. Collaboration across national organizations has yielded beneficial results. These efforts should result in better preparation of surgery residents to enter surgical practice, support junior surgeons entering surgical practice, and result in an enduring positive affect on the care of surgery patients.

### Disclaimer

The opinions expressed in this article are those of the author and do not necessarily represent the official position of the American College of Surgeons.

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