Apprenticeships: Preserving the Commitment in Surgical Education

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COMPETENCIES: Professionalism, Practice-Based Learning, Medical Knowledge, Interpersonal and Communication skills

INTRODUCTION

Historically, surgical training originated as an apprenticeship, but later it evolved into the more efficient and flexible team approach. Recent studies have demonstrated that the reintroduction of apprenticeship rotations into surgical team training schemes has tremendous positive effects and is very well received by surgical residents. We review our experience with the selective use of an integrated apprentice rotation in a previously team-based community surgical training program.

METHODS

Beginning in July 2006, a single-resident–single-surgeon apprentice clinical rotation was established for the PGY1-3 Union Memorial Hospital surgical residents. A single, high-volume, full-time faculty colorectal surgeon with a commitment to surgical education was identified. A 1-month rotation was organized around his clinical schedule (Table 1) that included preoperative and postoperative patient evaluations in the office setting, hospital rounds, and operative experience. The objectives were to expose residents early in their surgical career to private-practice general and colorectal surgery. In addition, residents would have the opportunity for improved continuity of care, following patients through the entire timeline of their disease process.

The junior apprentice resident would commence each day with hospital rounds on patients recovering from recent surgery and on patients for whom the attending physician was consulted and then discuss patient management issues with the attending physician. The resident would then actively participate in the private office hours, assessing patient complaints and discussing their outpatient management and then determining indications for surgery one on one with the attending surgeon. The resident was also expected to participate in surgery performed by the attending physician and then follow the patient daily during the patient's hospitalization as well as then reassess the patient postoperatively in the office. Shadowing the attending physician, the resident would learn direct patient management issues, how to discuss difficult diagnoses and treatment plans with patients and their families, and how to interact effectively with nursing, ancillary services, and other physicians. Additionally, residents would gain insight into practice development and management.

At the same rotation site, there is also a small group team with 3 attending physicians and 2 residents. These residents do not compete with the apprentice resident for surgical cases. Another resident would become involved only in the absence of the apprentice resident. All residents including the apprentice resident participated in mandatory didactic teaching conferences weekly without exception. Residents at this rotation site participated in home call, thus, in the hospital for normal workdays and emergency situations. Work hours never exceeded 80 hours, and there were no service cases at this rotation site. With satisfactory completion of these expectations, the apprentice resident was also free to participate on surgeries with the teaching service.

Several large university-based surgical programs have begun using an apprenticeship learning module in their curriculum with success. The objective of this study was to determine whether the addition of an apprenticeship rotation could enhance the clinical surgical experience of the junior house officer in a small community-based surgical training program. Over 2 years, we examined the apprenticeship resident's number and distribution of operative cases compared with his or her number of cases while on the traditional surgical services. Also, at the completion of each month, the surgical resident completed a rotation evaluation with feedback comments. Resident evaluations were scored from poor (1) to excellent (4) in categories such as number of patients examined, variety of disease, operative experience, clinic experience, attending involvement, and attending ability to teach operative skills and preoperative/postoperative patient management. Two categorical residents each

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TABLE 1. Weekly Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
Endoscopy Suite	Office[a]	Surgery	Office[a]/Surgery	Surgery

[a]Exposure to office practice. New and return patients are examined.

from postgraduate year 1–3 (total of 12 residents) participated in this apprenticeship rotation over 2 years.

RESULTS

Number and Distribution of Procedures

Table 2 summarizes the Union Memorial Hospital surgical resident operative and endoscopic experience during the apprentice clinical rotation. The average total number of cases performed each month was 44.2 procedures. One resident did very few procedures; however, the other 5 residents had an excellent uniform operative and endoscopic experience. The most common cases were separated into the American Board of Surgery categories of major general (18.2), endoscopic (12.1), alimentary tract (5.3), and abdominal (4.6). As residents were allowed to participate in other surgeries, this distribution of cases was wide and included pediatric, laparascopic, vascular, head and neck, and soft tissue/breast procedures. In comparison, similar level residents on the traditional surgical team (chief, senior, 3 interns) reported an average of 11.6 total procedures each month. These procedures primarily consisted of inguinal herniorraphy, laparascopic cholecystectomy, excision of skin and soft-tissue masses, and open breast biopsies.

Weekly Duty Hours

Each resident is required to keep time cards and to record the daily hours worked. The average weekly duty hours were 62 with a range of 50−75. All residents easily maintained compliance with the 80-hour weekly restriction.

Resident Evaluation of the Apprentice Rotation

After completion of the clinical rotation, each resident is required to complete an evaluation form. The questions pertained to the organization of the rotation, the case load, and distribution of operative, endoscopic, and office practice. Monthly evaluation results from12 residents over 2 years are illustrated in Fig. 1. The average monthly score was 3.8 out of 4.0. Very little variation was found in the range of results, which were excellent (3.6–4.0). Comments reflected the positive evaluation scores. Residents liked seeing the organization of an office practice and continuity of patient care. The few negative comments were related to the narrow clinical focus of the rotation.

DISCUSSION

Historically, aspiring surgeons trained with a senior surgeon for several years. The young trainee would act as an apprentice and, thus, slowly gain knowledge and understanding of surgical diseases and procedures. Surgical training evolved to a system combining rigorous didactics with clinical training. Advancement in the program was commensurate to years of experience and demonstration of ability. This process helped develop the team system approach that is the most prevalent method used today.

The team model is a very effective way to organize resident coverage for a group of faculty surgeons. The team model gives great flexibility in setting rotation schedules as the number of residents, their experience (ie, postgraduate year of training), as well as the number of attending surgeons can be adapted to suit the particular clinical needs at any given time. Additional educational advantages of the team method are as follows:

1. Resident Teaching: Senior residents oversee and teach junior team residents in patient care and surgical techniques.
2. Shared Clinical Experience: The experience earned from one clinical case is shared with all members of the team. Properly done, this amplifies the clinical experience compared with a single-resident–single-faculty service.
3. Flexibility in Resident Clinical Experience: With multiple residents on a team, there is a choice as to which resident participates on which case based on experience and interest.
4. Organization of Teaching Schedules: The team group makes organizing teaching conferences and discussion of clinical cases easier as all team members are sharing the same clinical experience and schedule.

TABLE 2. Number and Distribution of Cases Performed Each Month per Resident

SS+B	H+N	ALTR	AB	VASC	ENDO	PED	LAPB	ENDSY	TTLmaj	Total
2.5	4.2	5.3	4.6	1	2.5	1	4.5	12.1	18.2	44.2
1–6	1–11	1–10	1–10		1–4		1–10	5–18	1–34	1–81

Cases are listed as average number (top row) and range (bottom row).

Defined surgical procedure categories as defined by ACGME:

SS+B = soft tissue and breast, H+N = head and neck, ALTR = alimentary tract, AB = abdominal, VASC = vascular, ENDO = endocrine, PED = pediatric surgery, LAPB = laparoscopic-basic, ENDSY = endoscopy, TTLmaj = total major cases.