What Is the Best Method of Surgical Training?

A Report of America’s Leading Senior Surgeons

Clifford Y. Ko, MD; Edward E. Whang, MD; Raffy Karamanoukian, BS;
William P. Longmire, MD; David W. McFadden, MD

Objectives: To characterize the career choices and developments made by leading senior surgeons in this country and to examine hypothetically whether application of a short tracking program would have hindered their career decisions.

Design: A survey pertaining to each surgeon’s career, decisions, and opinions concerning surgical training.

Setting and Participants: Senior surgeons of regional and national surgical societies.

Main Outcome Measure: Survey responses.

Results: A total of 352 surveys (41.4%) were received. Respondents answered that the most common reasons for choosing a specialty were role models or mentors (56%), research (51%), and available patient population (23%). The 2 most common stages in a career at which the respondents became interested in a specialty, or an area of expertise, were at the junior residency level (when the specialty was chosen) and at the assistant professor level (when a more specific topic within the specialty was chosen). The most common stage at which the group believed they acquired their expertise was also at the assistant professor level. Seventy-one percent of respondents believed broad training was superior to a short tracking system, although none had participated in shortened surgical training.

Conclusions: Most leading senior surgeons in this country still believe that broad surgical training is superior and should be maintained. Because career specialties in this surveyed group were generally chosen in early residency, a hypothetical application of the short tracking system would have still allowed for these important decisions to be made. Also, it seems likely that specialty and career development would not have been hindered because “expertization” mostly occurred after training was completed. Regardless of training method, a role model or mentor seems most important in career choices and developments.

Arch Surg. 1998;133:900-905

STRENGTHENING pressures from societal, economic, and personal influences are bringing about increasing discussion concerning ways in which surgical training should evolve. As the number of fellowships or specialty training programs increases, these same influences have led to the consideration of shortened surgical training by instituting a system of “short tracking” into specific fields. The reason for a short tracking system is that overall training time is decreased. Several proposed systems tend to include 1 to 3 years of a clinical and basic research commitment followed by a final 2 to 3 years of subspecialty residency. This study characterizes the career choices and developments made by leading senior surgeons in this country and explores whether a short tracking system would have hindered their career decisions.

RESULTS

DEMOGRAPHICS

Of 850 surgeons polled, 352 surveys (41.4%) were received. The age of respondents ranged from 41 to 92 years (mean, 64 years); 29% were between 60 and 69 years, 27% were between 50 and 59 years, and 23% were between 70 and 79 years; 72% were full professors. The 3 most prevalent specialties were general surgery (40%), vascular surgery (13%), and cardiothoracic surgery (13%). Other represented specialties in decreasing order included surgical oncology, trauma, transplantation, pediatric surgery, plastic and reconstructive surgery, urology, neurosurgery, and colorectal surgery. Ninety-five percent of respondents completed a general surgery residency, 45% completed a specialty residency (ie, plastic and reconstructive surgery, thoracic surgery, and cardiology).
PARTICIPANTS AND METHODS

A questionnaire was mailed to 850 senior surgeons of regional and national surgical societies. The survey addressed issues related to specialization in surgery. Specifically, survey questions were designed to gain insight into how, why, and when in their career surgeons decided to become—or believed they became—specialists. Sample questions included the following: What is your surgical specialty? What influences led you toward choosing this specialty? What do you consider your area(s) of special interest or expertise within the specialty? At what stage did you begin to develop this special interest within the specialty? At what stage do you believe you acquired expertise in your area of special interest within the specialty? Finally, opinions were also requested concerning whether they thought a short tracking system into a (sub)specialty would be better than initial broad surgical training.

One or more answers were allowed for questions pertaining to the career stage during which decisions were made or expertise was gained. For example, if the respondent believed expertise was gained during the assistant and associate professor levels, both answers were included.

Demographic information, including age and professional rank, were requested; however, respondents remained anonymous. Responses were analyzed in conjunction with the UCLA Department of Statistics, Los Angeles, Calif.

SPECIALIZATION—CHOOSING A SURGICAL SPECIALTY AND AN AREA OF EXPERTISE WITHIN THE SPECIALTY

The respondents stated that the most common reasons or influences for choosing a final specialty were role models (56%), research (51%), and available patient population (23%). Other reasons, in decreasing order, included faculty opening, hired to fill a specialty, lifestyle, and monetary reimbursement (Figure 1). The stage in which most respondents became interested in a specialty was at the junior residency level (47%), followed in frequency by the senior residency level (Figure 2). The stage in which most respondents became interested in a more specific topic within a specialty was at the assistant professor level (54%), followed by the associate professor level (Figure 3). The most common stage in which the respondents believed they acquired their expertise was also at the assistant professor level (49%), followed by the full professor level and then the associate professor level (Figure 4).

SHORT TRACKING VS BROAD TRAINING

Although 71% of respondents believed broad training was superior, 24% believed short tracking would be superior and 5% were undecided. No respondent had participated in a short tracking system.

COMMENT

Significant surgical advances have been made in the past decade and are generating great changes in the field of surgery. Such advancements include vast expansion of the knowledge base for disease processes and physiology; an increase in operative technology; an increase in supporting diagnostic, anesthetic, and nonoperative therapeutic technology; and advances in the organization of surgical care. The advent of managed care is also creating significant changes.

Academic medical centers are downsizing and scrutinizing to compete with for-profit hospitals, which is especially difficult because the commercial hospitals do not have the same training obligations. In addition, cuts to the Medicare graduate medical education budget are being considered, which would result in decreased funding to support academic medical centers for postgraduate training. With such changes, it is obvious that surgical training is likewise undergoing an evolution. The question is: How exactly should surgical education evolve?

The present study characterizes the careers of senior academic surgeons in an effort to determine how best to train an academic surgeon. Specifically, we investigated when 3 key events occurred during surgical training: first, when surgeons developed an interest in a surgical specialty; second, when surgeons developed an interest in a special area or niche within their specialty; and third, when surgeons believed they attained expertise in their special area or niche.

The results of our study demonstrate that most respondents developed their interest in a surgical specialty during the junior residency level. This is a logical finding because the junior resident years are usually when the best overall introduction and experience of the surgical specialties are gained. Although many medical students entering a general surgery residency believe they already have a strong interest in one specialty or another, the years in junior residency definitely offer certain advantages, such as better experience with most (if not all) of the various specialties, more appropriate experience with the specific patient care, and more interactions with potential role models or mentors. Therefore, although surgical training may be changing and even shortening, the broad introduction and experience of all the surgical (sub)specialties during the junior residency years should remain a part of surgical training. Choosing a surgical specialty in medical school before experiencing junior residency can theoretically lead to an uninformed choice because only a few surgical rotations are routinely experienced. Clearly, although some (sub)specialties, eg, ear, nose, throat, neurosurgery, urology, orthopedics, and plastic and reconstructive surgery, rely on their residents to make that choice in medical school, it remains unclear which system (ie, making a career choice in medical school vs in junior residency) is better.
Also demonstrated in the present study is that most respondents became interested in a special niche within their chosen specialty early after their formal training was completed, ie, at the assistant professor level. This finding is also logical because at the junior faculty level the surgeon ideally has acquired all the necessary tools to practice surgery and build a career and thus is free to explore and develop a niche. This paradigm seems to be valid because the outcome of our third inquiry was that the highest percentage of respondents (49%) believed they acquired their specific niche expertise also at the assistant professor level. This result is consistent with results of previous reports that also suggest the early faculty years (eg, the first 5 years after training) as crucial for the development of successful academic surgeons.17 Current surgical leaders seem to agree when they suggest that methods should be protected for allowing junior faculty to gain the clinical experience they require, free from pressures of practice, so that they can devote their time and energy to academic productivity.3 Although early support is important and gaining expertise can occur relatively early in a career, achieving mastery continues beyond the early faculty years. Twenty percent of respondents believed they acquired expertise in their niche as an associate professor, and 24% acquired expertise at the full professor level.

Given the present study results, the 2 periods in a surgical career when most of the respondents made a crucial career decision were at the junior residency level and immediately after training (ie, during the assistant professor level). Taking this to be true, the application of a short tracking system is, at least, logistically possible—ie, a system of specialty training after a broad experience of junior residency.

Even if it’s logistically possible, why should a short tracking system be considered? The most basic answer is that training time is shortened (shorter than performing a general surgery residency followed by specialty residency) but specialization can still be accomplished. According to the National Board of Medical Examiners, the average number of years required by the 24 boards represented by the American Board of Medical Specialties is 5 years. For primary board requirements in nonsurgical specialties, an average of 3.8 years is required. To qualify for surgery boards, 6.4 years is required before one is eligible to sit for the qualifying examination.18 To alleviate this lengthened period, numerous changes have been proposed for surgical training in the future.16-15 Most, if not all, proposals include core surgical training in the first 1 to 3 years, with subsequent surgical specialty training, including general surgery. In all proposals, advanced specialty training is offered sooner than in today’s training programs.

The strong need for specialty training is being repeatedly suggested, including within general surgery.2,19 Because of the increasing complexity of operative surgery, as well as the expansion of clinical knowledge,
some believe that general surgery training programs are currently imparting a less complete degree of competency in general surgery than in the past. According to Way, the present-day call for fellowships is an oblique recognition that the deficiency in general surgery training has reached a point at which formal action is needed. In part, the reason currently to have a fellowship in general surgery is because of the training of senior residents destined for other specialties. With the finite number of teaching cases, some believe that general surgery is presently squandering precious training opportunities on residents who will practice in other fields while graduating incompletely trained general surgeons. Some of these issues could be avoided with earlier specialization for the specialties. Currently, it has been estimated that more than 60% of general surgery trainees enter subspecialty training, and in university programs, the number is usually higher.

Finally, with respect to surgical training, there are certain aspects of education and training that remain consistent throughout the different generations of surgery and surgeons. In this study, as expressed by the respondents and as is obviously still evident today, the role model or mentor relationship is an aspect that remains essential. It was, and likely still is, the single most important influence for choosing a specialty and for successful career development. In the midst of the current pressures to spend an increasing amount of time with clinical duties, the role model or mentor relationship should remain a top priority in academic surgery for both the mentor and the student.

In summary, although the health care environment is continuing to change, so too is the education and training of surgeons. In an attempt to effect a more positive and informed change, we set out to investigate and characterize the careers and decisions of today’s leading senior surgeons. A junior residency program with broad competencies, the role model or mentor relationship should remain a top priority in academic surgery for both the mentor and the student.

In the conclusions reached by this group are not surprising: (1) senior surgeons feel that broad surgical training is superior and should be maintained; (2) career specialties are generally chosen at the junior resident level; and (3) subspecialization is chosen within a specialty depending on the needs of the practice environment, the availability of patient material, and their personal interests. Each is a jumping off point from general surgery. Prior attempts by the American Board of Surgery to differentiate surgical residents after the third year into surgical specialties have been persuasively discussed but, much like the weather, nothing has been done about it.

Edward Sills, in his book Academic Ethic, relates that our profession’s central purpose is generational improvement. We are role models, and if surgery is to be attractive, and if they regard our profession as a life worth living, then they will choose our vocation. We are agents for making surgery better, generation by generation.

Surgeons are completing their surgical training at an age later than the Jesuits are ordaining their priests! Reasons for the late age at certification are multifactorial. This study is skewed by the definition of “senior surgeon.” Residents in training today must be competent in open and closed operative skills, which has added a new dimension to our educational process. Questions stimulated by this study persist: Why is case material diverted from residents who plan to practice general surgery to other chief residents who will be entering colorectal, plastic and reconstructive, or cardiothoracic surgical specialties? Can we continue to permit individuals to possess double and triple certification? Surgeons not successful in specialized fields often revert back to practice general surgery. Where is the real opposition to shortening this process? Liver, pancreatic, vascular, endocrine, and gastrointestinal surgery are areas where general surgery chief residents need volume, experience, and faculty supervision.

While looking at career choices and influences on residents, this review by the UCLA group will stimulate others to reconsider their educational proposal. Surgery. 1992;112:116-117.


investigate the sanctity of time-honored practices troubling our discipline and will only serve to shunt talented students to other areas. Residents arriving at 5:00 AM to conduct ward rounds and then into the operating room for 8:00 AM cases is questionable at best. Have we sincerely enforced the RRC guidelines that education has as much validity and priority in a program as service, particularly when many of our house officers are working 90 hours or more a week? These outcome measures need study in our continuing review of graduate surgical education. Our matching system for residents occurs so early in their training that they do not have sufficient time for clinical maturation before making a lifetime decision. A recent study by a major surgical association recommending that 2 years of community service be added to current training requirements was unrealistic, not needed, and self-defeating for surgery as a discipline.

Lawrence A. Danto, MD, Sacramento, Calif: I rise to support the need for broad surgical training, although the terms “broad” and “in general,” when applied to surgical training, seem to create an oxymoron. My comments are relevant not only to this excellent paper but to yesterday's papers on trauma management systems as well.

First, it is becoming increasingly clear that capitation has no legitimate place in a health care system designed to save lives and/or educate physicians. The capitation of life and education is excessively totalitarian for American health care in the 21st century.

Second, it is becoming increasingly clear that some form of universal health care system will be essential to ensure proper health care and medical education in any industrialized society with a sense of social consciousness.

Finally, although I agree with the comments yesterday by Drs Organ and Passaro that prevention is an important and admirable health care goal, prevention often becomes an impossible dream, especially where trauma is concerned. Like it or not, the reality of effective health care delivery is not prevention—the reality is preparation. In spite of what the technocrats and HMO administrators would have us believe, education is the inescapable major part of preparation. We may not need to be specialists, but it is our education that makes us special.

My question is this: Have the authors considered capitation per se as a financial incentive to encourage short tracking in postgraduate medical education? Is short tracking even cost-effective in the long run?

Lawrence W. Way, MD, San Francisco, Calif: Although the data are quite interesting, the observation that those who have achieved success in surgery endorse the system in which they developed is not surprising. In fact, comparable surveys in other medical specialties or even in nonmedical fields would probably show results that are largely similar, even in instances where career decisions have to be made according to entirely different time tables. In some professions, for example, an area of specialization will be chosen as early as high school, 8 to 12 years earlier than in surgery. The question is whether changes in surgical training that shifted the points at which career decisions had to be made would appreciably affect the results of a survey such as this.

A second point is that the production of competent practitioners is the principal goal of specialty training, not satisfying the personal preferences of the trainees per se. Although the professional's personal desires must not be ignored, any reasonable program that generated thoroughly competent specialists would almost certainly be satisfying. Surgical training is long. It is expensive for society and in a multitude of ways for the trainees themselves. There are a number of drawbacks in today's world to the broad curriculum in which the present generation of senior surgeons was trained. If competence is kept as the chief goal, important structural changes (Am J Surg. 1996;171:2), including tracking, should be possible while preserving or even increasing the level of retrospective satisfaction.

Orlo H. Clark, MD, San Francisco: I wonder if from the questionnaire the authors can determine whether basic science training and education had any impact on the training of surgeons. For example, did surgeons who received such training receive more NIH training grants or were they promoted more quickly?

John R. Benfield, MD, Sacramento: In September 1996, the Thoracic Surgery Directors Association (TSDA) had a 2-day retreat to address two fundamental issues: the preparatory or prerequisite education of thoracic surgery residents and the adaptation of thoracic surgery residencies to decrease in funding for postgraduate education. In a keynote address, the president of the American Association of Medical Colleges, Jordan Cohen, advised us to keep the goals of education as a priority.

Ninety-one program directors, 53 associate directors, and selected guests, including residents, considered 6 major topics that included the prerequisite curriculum, the relationship between thoracic surgery and general surgery, and the desirability of continuing to require certification by the American Board of Surgery (ABS) as a prerequisite for examination by the American Board of Thoracic Surgery (ABTS).

We identified 8 mandatory categories of knowledge and skill and 10 desired or optional categories. It was agreed that prospective thoracic surgical residents should be identified at the earliest possible time and that thoracic surgery directors should undertake local and national negotiations toward assuming responsibility for the prerequisite education of their residents. The purpose is to develop greater focus upon preparation for thoracic surgery than now exists, thereby to improve the total postgraduate education of thoracic surgeons. It was also agreed that negotiations should be undertaken toward permitting ABS certification concomitant with the completion of prerequisite education.

An important group of directors favored making ABS certification optional and increasing the length of all thoracic surgery residencies from 2 to 3 years. However, the TSDA concluded that the existing prerequisite requirement for ABS certification has served thoracic surgery well and that a better substitute does not now exist. The TSDA made a commitment seriously to consider the proposal to drop the ABS certification requirement and to work urgently toward improvement of prerequisite education for thoracic surgeons.

In the spring of 1997, just before completion of my term as president of TSDA, I was pleased to be invited by the program directors in surgery to discuss the content of the TSDA retreat and mutual plans for the future. Everyone agreed that primary consideration will be given to content and not to the time required for education. The content and educational value of the prerequisite curriculum and of the curriculum and experience in thoracic surgery residencies will remain the primary and preeminent guideline for change.

In summary (Ann Thorac Surg. 1997;64:1212-1215), thoracic surgeons are working toward change that might include shortening of the period of education for our specialty, but only if change results in better education. With few exceptions, senior thoracic surgeons agree with the conclusions of Dr Ko and his colleagues.

Dr Ko, an important issue in surgical education is the balance between residents' energy devoted to service and to their education. Did your survey address this issue, and would you comment about it please?

Bruce M. Wolfe, MD, Sacramento: It certainly is a portable concept that a general surgeon should have broad technical and operative experience, but as Dr Organ mentioned, it is increasingly difficult for us to provide adequate operative and technical exposure to the broad range of procedures that con-
stitute general surgery. Gastrointestinal endoscopy is a case in point. I often find myself working with a resident doing a flexible endoscopic procedure who has already made a career choice that will not involve flexible gastrointestinal endoscopy in the future. At the same time, our residents complete the program with insufficient numbers of cases to be credentialed or technically expert in the performance of these procedures. My conclusion is that an intermediate approach may be useful wherein cases would be concentrated in the hands of the residents who have a particular interest in an area such as gastrointestinal endoscopy without having to establish a formal short tracking program of 2 years of special training. Lengthening the training in order to give our surgical trainees adequate exposure to surgical endoscopy does not appear to be the way of the future.

John T. Vetto, MD, Portland, Ore: I would like to build on Dr Way's first point—which I am also concerned about—the fact that our medical students are having to declare their interest in surgery earlier and earlier. Almost regardless of what a survey might show, this is what we have all seen. Every year I interview medical students who declare they want to go into surgery for the rest of their lives based on 2 or 3 weeks of exposure to general surgery. I am concerned this trend will worsen, and I think it may explain the national trend toward higher dropout rates in surgical programs.

Accordingly, I have 2 questions for the authors. (1) Do they have a subset of data of younger respondents? When did they decide to make career choices? (2) Do the authors think that it is a lost battle trying to increase exposure to surgery, especially general surgery, in medical school?

John K. MacFarlane, MD, Vancouver, British Columbia: I thought I could just bring you up to date on what is happening in Canada for those of you who don't know. This I think is relevant to the whole issue of the fast tracking concept. Our Canadian training programs number 16, and each of them is associated with a medical school. With the exception of thoracic, pediatric, and vascular training, all other disciplines in surgery, including general surgery, have gone to a core 2-year program. This is following the fourth year of medical school, and the trainees are matched into this program in November of their final year. This has required some curricular revision in the medical school curriculum which will allow people to see as many of the disciplines in surgery or medicine as they can prior to making this decision. So all of these decisions have domino effects within the medical education system.

We have no internship in Canada at the present time. The postgraduate positions are funded by the government of course, but the good news is that pedagogically it seems as if the trainees in the 2-year core program are receiving a well-balanced, broad view of the core of their chosen discipline, and the core programs are under the aegis of the residency training program committee of that subdivision. It is working, and I would urge you to consider this model when you are discussing this change for American surgical trainees.

Dr McFadden: I would like to explain this paper's genesis to you. It was the sole idea of 2 chief residents at UCLA. I am chagrined to say that it was not a faculty member or a surgical educator who came up with this idea; it was Dr Ko and Dr Whang, showing that they are thinking about the future, not only for themselves but for surgical education.

They showed some leadership in getting a medical student to help with the data accrual. They showed a great deal of wisdom in asking Dr William Longmire to assist in the preparation of this manuscript. His judgment was immeasurable. I guess they showed some practical logic in asking me to get involved because they knew that I would eventually have to stand up here and weather all of your comments.

This is a survey, and the danger in presenting the results is overinterpretation. I don't believe we did that. The study certainly asks more questions than it answers. Will Durant once said that the future doesn't just happen; it is created. Surgeons need to get involved in the creation of their own surgical future.

Over a dozen formal proposals for changing the current surgical education have been described in the literature over the past 5 years. Most, if not all, do suggest a form of training consolidation or short tracking. These systems would usually shorten surgical training and allow more focused training for specialists while preserving core general surgery for future general surgeons.

I really appreciated Dr Organ's comments. We did not start this out to be a survey of senior surgeons. That's the way it turned out. We sent out 850 questionnaires, and we had a 41% return rate. Seventy-six percent of those who returned the survey were over the age of 50, and the majority were in the associate to full professor rank. I don't know how to interpret that. I don't think it's because they have more time on their hands. I think it's because they have had more time to think and be concerned.

I agree with Dr Organ's comment about the need for outcome studies, and I would hope that the American Board of Surgery, the American College of Surgeons, and specific regional surgical societies such as our own would take active roles in these studies. They should be performed quickly, however, because economic and legal issues may push these decisions away from us. Dr Danto, your comments about capitation are very important. Unfortunately they were not considered in our survey. I do believe the economic issues that you discussed should be studied further in a controlled fashion.

Dr Way, I appreciate your comments specifically. Your own paper about surgical education was an important resource for the preparation of this work.

Dr Clark, we did not look at basic science training or research as an index of satisfaction or success. However, it is important to mention that the number one reason that respondents mentioned that they no longer performed research was an increasing administrative load. This usually coincided with themselves being appointed either to division chief or department chair.

Dr Benfield, I appreciate your comments and leadership about thoracic surgery. Our survey did not ask about the balance of service and education, a clear issue that should be further investigated.

Dr Wolfe, your comments about a compromise position between conventional surgical training and short tracking is intriguing and perhaps may be the best answer. The American Board of Surgery does allow for a portion of the chief residency year to be performed in another year. Perhaps this may be an opportunity for us to focus the surgical interests of trainees.

Dr Vetto, we did not separate out the younger respondents vs the older respondents. There did not appear to be a difference in terms of the decisions and the answers made. I do agree, however, with your comments that we should increase exposure to general surgery to medical students. We have to pursue this aggressively. Other departments and divisions are actively pursuing educating medical students in general surgery. At UCLA, family medicine issues a proposal every year to teach basic surgery to our medical students.

Dr MacFarlane, your comments about the Canadian point of view are very interesting. Similar systems are seen in Australia with excellent results, and I believe we should use these as a model for our own development.

Mark Twain said: “I have seen a lot of terrible things, and most of them never happened.” Well, I don’t think this is the case in surgical education. We have a lot of external forces that can make such things happen. The future of surgical education is in our hands as mentors, educators, and clinicians, and we must guide or create our own future.