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Discussion

DR. FRANCIS D. MOORE (Boston, Massachusetts): I congratulate Dr. Jonasson for giving us this interesting look at man- and woman-power in surgery and at total years in practice and the termination events for surgical practitioners, two things that we did not examine at all in our surgical manpower studies several years ago.

As we all realize, general surgery is the least anatomically defined of the surgical specialties, and it is the specialty of surgery that contains the largest number of nonboard-certified specialists in the United States. The "occasional surgeon" calls himself a general surgeon. The general practitioner who does some surgery is a "general surgeon." One must be cautious in understanding what they do and who they are, especially in small communities. In our work, we tried to control this problem by concentrating on board certification.

All of our studies in the last 15 or 20 years have been confined to the board-certified cohort. We showed that board-certified surgeons contribute the predominance of leadership in surgery, have the largest hospital practices, command the largest facilities, are predominant in the referral centers, and remain in practice longer.

What is the content of general surgery? It deals largely with the gastrointestinal tract, its satellite glands, the peritoneal cavity and its contents. And yet it is not "gastrointestinal surgery." General surgeons also take care of breast tumors and certain other peripheral tumors (especially thyroid, parathyroid, and sarcoma). Breast surgery is a major component of general surgery. Maybe general surgery should be denoted as "guts and glands." But we also take care of a very large component of trauma and accept the huge burden of burn care. Possibly "guts, glands, and trauma" is general surgery. In academic terms, general surgery is the garden from which the other specialties grow, as Dr. Jonasson has so clearly expressed. And, it is responsible for a large share of undergraduate teaching.

The need for any category of surgeon depends primarily on the scope, epidemiology, and nature of the diseases treated by that particular group of surgeons. This seems to be a platitude, but it bears a lot of reflection. I will give you an example. Coronary heart disease has not changed very much in its incidence and distribution in this century. Yet the development of coronary artery surgery first reported, as I remember so well, to this Association in about 1965, has completely revolutionized the need for experts in thoracic and cardiac surgery. Here is an example where a discovery, a development, an innovation has radically increased the need for surgeons of a certain category.

Consider the "manpower effects" of antibiotics on mastoid and osteomyelitis surgery. During my student and internship days, mastoidectomy was a common procedure and mastoid infection was the most common cause of brain abscesses in children. Osteomyelitis occupied a great deal of our time. This entire range of surgery, which was handled largely by otolaryngologists, orthopedists, and general surgeons, simply has vanished.

In considering future projections, let us look at what is going on currently. Transplantation is the largest entirely new field of medicine, surgery, and basic science to have originated in this century. The first description of extensive experience was with kidneys in 1952 and 1955. This is rapidly developing into an entirely new field of surgery with measurable increases in manpower (and womanpower) needs. There are approximately 1200 transplant surgeons in this country. They have grown a new society, approved training programs, and a modified term of certification. And in terms of what Dr. Jonasson has mentioned, they may be, possibly already are, the next group to break off from "general surgery." She has very rightly used the term "general surgery-based specialties." This would include most of transplantation, but not all.

Urologists have contributed greatly to kidney transplantation. Cardiothoracic surgeons currently do all of cardiac transplantations. Liver transplantation still is growing rapidly. There are no less than four papers in this program on liver transplantation. This remarkable operation is largely done by people who would call themselves general surgeons.

Will this new specialty, which is in a sense an intellectual community with different anatomic resources, break off from "general surgery" as a new specialty? In terms of training, immunologic research, and anatomic specialties, the answer is definitely "yes."

It is thus clear that prediction of the need for general surgeons in the next 20 or 50 years will depend not alone on population or distribution but on new things developing in surgery and its neighboring sciences.

DR. LAZAR J. GREENFIELD (Ann Arbor, Michigan): Certainly the high response rate to the survey reflects the kind of interest that was seen in our earlier review of this Association. The evidence that surgeons are retiring at a later age reverses a transient trend that was evident in an earlier survey by Brian Miscal, who found that there had been a decrease in the retirement age among the College population at the time of his survey just a couple of years ago.

We know that a number of variables influenced the decision, as documented in Dr. Jonasson's study, chief among which was the category of unfavorable changes in the practice of surgery. It remains unclear, however, how often other financial pressures contributed to the decision to continue to work in this era of declining reimbursement, such as later or second marriages, with tuition expenses and higher malpractice coverage costs for exiting a practice. Perhaps some of these were evident in the narrative responses.

The survey excluded surgeons who were older than 65 years of age and still practicing. I wonder if Dr. Jonasson has any idea of the size of this group. In our earlier survey of the American Surgical, a large number of surgeons continued to practice into their 70s. The survey also did not take into account the population of international medical graduates and other surgeons not members of the College whose decisions regarding retirement may differ. Another group of unknown size were those who chose to become life members of the College a number of years ago without requirement for notification of retirement. What was the size of this group and would it have influenced the outcome if that decision were to be related to earlier retirement?

The influence of managed care on retirement decisions of surgeons remains an unknown variable. The potential broader role for general surgeons may influence the historical trend toward surgical subspecialties. I wonder if Dr. Jonasson has any thoughts in this regard, particularly as federal reimbursement for residency training may become limited to the first level of certification.

The end of mandatory retirement has the potential to postpone retirement for many surgeons whose continued practice may restrict the opportunities for younger surgeons. With the rapid changes in technology as witnessed by the acceleration in minimally invasive procedures, the evolution of surgery depends on the continued invigoration provided by a new generation of surgeons. We must ensure that their opportunities are not restricted.

Finally, if the actual general surgery practice years have declined by 20% over the last 10 years, what are the implications for the work force for the future given the present trend to restrict the number of specialty trainees in favor of primary care? And do you feel that extending the practice years beyond the 60s would be the optimal strategy to maintain the work force absent a method for performance evaluation?

DR. ARTHUR H. AUFSES (New York, New York): Dr. Jonasson is to be commended for bringing this very interesting study to our attention. It is part of her ongoing work at the American College of Surgeons to bring rational data to the table to help look at the never-ending saga of the surgical work force. In this saga, I for one cannot be sure whether the work force glass is half full or half empty at this time.

As you have just seen, there is an enormous amount of data in the manuscript, and I can only comment on some of the facts presented. Dr. Greenfield has already noted a number of the same issues that I would have brought up.

One of the more interesting pieces of data in my view is that the general surgeons are retiring about 2 years older than they were some 12 years ago. I think this is contrary, as Dr. Greenfield pointed out, to what many of us have assumed. I for one was certain that the average age of retirement of all physicians, including surgeons, had declined significantly in the past decade. And we know that this is certainly true in the state of New York.

There is one disturbing piece of news, however, in the report. The 250 retirees in 1995 represents a very large jump in general surgical retirees over any of the past 12 years. Should this trend continue, there will be significant decline in the number of surgeons in a very short period of time.

Dr. Greenfield has already compared these data to his own study. The only question that I would ask is, could it be that so many of our membership in the American Surgical Association continue to work because we are not affected by the category of "unfavorable changes in surgery" to the same extent as other surgeons appear to be? The paper raises a number of additional questions.

Might there be other causes for the rise in retirement age? One of the things that I thought about was that a few years ago the tax laws changed, so that physicians and others are no longer able to put away substantial sums of money, which would have led to perhaps earlier retirement.

Is there a geographic distribution in the retirement pattern? If these unfavorable changes in surgery are the main reason to retire today, then one might expect more retirement in areas where managed care has had its greatest impact. What is likely to be the impact on years of surgical practice for surgeons as more women enter the general surgery work force?

As the surgical specialties contract, more individuals will remain in general surgery, reversing the trend of the past number of years. What effect will that have on the work force and will we therefore have to reduce the number of general surgeons that we train? I want to commend Dr. Jonasson again for this

presentation and look forward to further studies on the subject from her and her colleagues.

DR. GEORGE F. SHELDON (Chapel Hill, North Carolina): I want to congratulate Dr. Jonasson for this very important paper which now begins to segment the known numbers into the product of production of surgical work force. How long physicians work is an important part of work force planning, and how much work they do during that period of time is an additional dimension that we have yet to develop.

According to a survey done by Merritt, Hawkins & Associates, which is supposedly the largest national physician search firm, I offer a quote from their president, which is as follows: "As physicians over 55 want to retire, it now takes two of the new physicians to replace them because of the smaller number of hours they want to work." This is actually being factored into work force planning with recruitment agencies.

It is very difficult to know the diseases and the practice mode and the culture of the future, which has always plagued all work force planning. I think everyone knows that every 7.5 seconds a baby boomer turns 50, and that has not been a group that has been inclined to deny themselves technological health care or other things.

In the growth of managed care, we see the continuation of the evolution from really a longer trend, which is that of group *versus* solo practice. Forming groups has been going on for some time and really a natural outgrowth of this has been managed care. Our biggest—and I believe our most immediate work force issue—is the one that was dealt with in a recently distributed Institute of Medicine study in which I had an opportunity to participate. It is the issue of the accessing of our health-care system by our international medical graduates (IMGs). We wish to continue our cooperation and our educational relationships with other countries, but all Western industrialized countries have overproduced the physician work force. The United States cannot be the safety valve for excess physician production in the international community. Instead, this requires good international medical and surgical leadership and good planning.

I would like to ask Dr. Jonasson if she has any data related to the IMGs and their practice modes, especially as they relate to retirement. I congratulate her and express appreciation for the fact that the College continues to do this work.

DR. R. SCOTT JONES (Charlottesville, Virginia): I think Dr. Jonasson has brought us information on the work force that is probably in sharper focus than we have had before. I wanted to discuss this paper to ask a question, which already has been posed by Dr. Aufses.

We are observing certainly in medicine increasing numbers of women in medical school and in practice. This is perhaps a little bit proportionately less in surgery, but I wanted to ask Dr. Jonasson to comment on whether that will have any effect on the work force in general surgery and on the retirement age.

DR. C. JAMES CARRICO (Dallas, Texas): I want to thank Dr. Jonasson for the opportunity to review the manuscript and for providing an important piece of information that we need to put together the complete picture of the surgical work force.

There are at least four pieces of information needed to understand the dynamics of the surgical work force: 1) what is the current work force, 2) how many are entering, 3) how long do they work, and 4) how hard do they work?

Drs. Jonasson and Sheldon produced a careful analysis of the first, the size of the work force, in their 1994 article in *JAMA*. Today, Dr. Jonasson has added information regarding the second and the third, how many people are entering the work force and how long do they work?

Based on these data, she has concluded that when compared with estimates of need, even with the most conservative estimates, that we are not overproducing general surgeons. In fact, we may be underproducing general surgeons. This is an important piece of data and needs to be disseminated.

We can be sure that these data will be carefully scrutinized, especially by those whose current perceptions are different than that. With this in mind, it is important to ask are there weaknesses in this study and try to bolster them. I would like to ask Dr. Jonasson questions about two of the assumptions.

First, the data collected were from Fellows of the American College of Surgeons, and as she said, this represented approximately two thirds of the general surgery work force. It was assumed that the data could be generalized to the non-Fellows who compose the other third of the work force. My first question then is, what information can you provide to validate this assumption? Specifically, how many non-Fellows would have had to retire either significantly earlier or later to impact on your conclusions? My rapid math suggests that if all that other third worked 4 years longer, then the conclusions would change. I would appreciate your comments on that.

Another major assumption is that the residents who continue in general surgery-based residencies would not contribute to the surgical work force, and therefore, you have subtracted all of these surgeons from your calculations of the work force. This undoubtedly is a reasonable and safe thing to do with residents who enter plastic and thoracic surgery; however, it seems less certain that residents entering training programs in vascular surgery, surgery oncology, colorectal surgery, etc., will totally withdraw from the general surgery work force.

So my second question is can you provide us any information or estimates about how many of this last group, the ones entering those programs for certificates of added qualifications, will continue totally in that specialty and how many will either in part or in whole practice general surgery? And again, how much would an error in this assumption impact on your calculations?

I believe this is very important data and I am sure Dr. Jonasson will continue to pursue it. Thank you very much for bringing this to our attention.

DR. OLGA JONASSON (Closing Discussion): Dr. Moore really put this problem in perspective. General surgery is what general surgeons do. What we will do in the future depends entirely on the foresight and the vision with which we change and educate new surgeons as they enter the work force. It is very important for general surgeons to be ahead of the curve in new technology

and to maintain their skills and their opportunities, as was pointed out by several discussants.

The nonboard-certified surgeons, or the remainder of the surgical community who are not Fellows of the College, may be represented in the database that we analyzed from the American Medical Association (AMA) Masterfile of physicians. In this slide that you saw previously, is depicted the maximum and minimum scenarios that Dr. Sheldon, Mr. Kwakwa, and I calculated in 1995. The AMA Masterfile, as you may know, allows physicians to self-designate their specialty based on spending 50% or more of their time practicing in that specialty. These figures were used to derive the maximum scenario, which excluded only residents. Included in the Masterfile under general surgery, interestingly enough, are cardiovascular surgeons, pediatric surgeons, head and neck surgeons, and a variety of other surgical specialists. If we assume that these specialists practiced at least 25% of their time doing general surgical procedures, we derive the maximum scenario, which also included surgeons who spend the majority of their time in administration or research. The minimum scenario excluded entirely the general surgery-based specialists. The differences here represented in the maximum and minimum scenarios answer the question asked by Dr. Carrico: What if surgical specialists also did general surgery? Also, many of the noncertified or non-Fellow surgeons are included in the AMA Masterfile.

I have no information on the precise patterns of international medical graduates. We will be doing this potentially interesting analysis in the near future, but have no data on that at this time.

Dr. Greenfield asked about life members and the possible impact of omitting them in the retirement analysis. At the moment, there are only 317 life members, and I do not believe that their small numbers have been a factor in our estimates of retirement age. There have been very few life members since the structure of that program changed approximately 20 years ago, and the program is no longer available. We have not surveyed the Fellows older than 65 who have not retired, but this would also be of interest.

There are other categories that are difficult to analyze because sufficient data have been unavailable, such as the possible influence of geography. We did not look at geographic differences in retirement. Also, we did not separately analyze the women in this retirement group simply because there were so very few of them during this time frame. It will be at least 20 more years before sufficient women are in the work force to merit a separate analysis. In the data that the AMA has provided about women and their work patterns, the assumption is correct in the aggregate of all women physicians, that they work fewer hours, fewer weeks in the year, and perhaps retire earlier than their male colleagues. When the subset of women surgeons are identified in this database, an extremely small number, the women surgeons worked longer than their male counterparts, longer work weeks and longer work days. The retirement ages were not analyzed.

There will be, I am sure, a trend toward decreasing enrollment in surgical specialties. These trends need to be monitored very closely if we are to maintain the appropriate work force in general surgery. As plastic surgery, perhaps thoracic surgery, and other surgical specialties change their graduate medical education curricula and, perhaps, their certification requirements, the final output of general surgeons will need to be watched very closely to maintain an appropriate balance.

How hard general surgeons work is an important question. Modern cohorts of general surgeons work fewer total years than in the past, by a substantial amount. Does that mean that there are less general surgery services provided? Or, is it that the fewer general surgeons are actually working harder? Although I do not know the answer, there probably is a mix of both factors and, as general surgery has fragmented, more general surgery services are being provided by specialists. There also is anecdotal evidence from the comments of the retirees in our survey, that general surgeons are working harder. Their comments on the questionnaire are most insightful. Many felt that they were burning out, and they really did not want to continue to work so hard and looked forward to retirement.

Dr. Carrico also asked about the non-Fellows, and if we could get any data on their retirement patterns? This is very difficult because none of the other available databases include age of retirement. For instance, the American Board of Medical Specialties listings include physicians well into their 90s and makes no attempt to indicate retirement status.

General surgery is a somewhat fragile specialty that provides the backbone of the care of the surgical patient, the trauma care, the emergency care, the whole care. This is not a boutique specialty. It is a very general specialty that provides essential services. The full spectrum of general services provided by these general surgeons who have not specialized further, remains a necessary component of our health care and is something we need to be assured is maintained in the future.