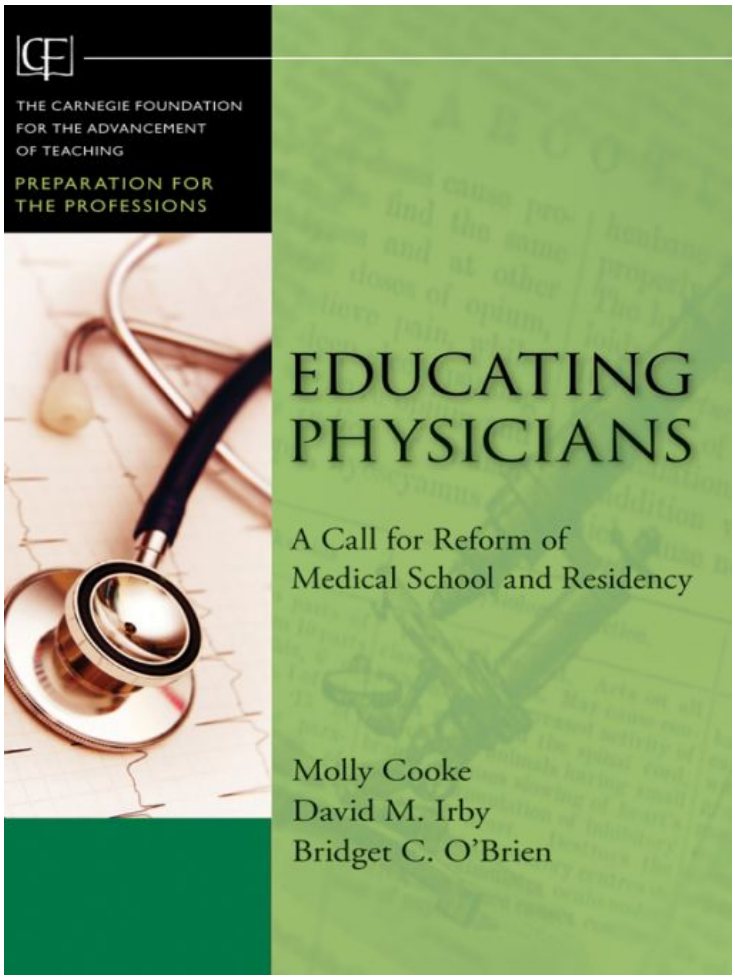
THE CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING

PREPARATION FOR THE PROFESSIONS

EDUCATING PHYSICIANS

A Call for Reform of Medical School and Residency

Molly Cooke
David M. Irby
Bridget C. O'Brien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Lee S. Shulman

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The Preparation for the Professions Series reports the results of The Carnegie Foundation for the Advancement of Teaching's Preparation for the Professions Program, a comparative study of professional education in medicine, nursing, law, engineering, and preparation of the clergy.

FOREWORD: ON THE SHOULDERS OF FLEXNER

“The present report on medical education forms the first of a series of papers on professional schools to be issued by the Carnegie Foundation.” So wrote Henry S. Pritchett, the first president of The Carnegie Foundation for the Advancement of Teaching, on April 16, 1910, in the opening sentence of his introduction to Abraham Flexner’s now-famous Bulletin Number Four, *Medical Education in the United States and Canada.* Having served as Carnegie’s eighth president, I now present my own Foreword to this new report on the education of physicians almost precisely one hundred years later. Whereas Flexner’s report was among the first issued by the fledgling organization, the current report builds on more than a century of distinguished work, taking its place as the *last* in a series of studies of professional schools conducted by the Carnegie Foundation in recent years.

While Flexner’s study of medical education opened a century of work on professional preparation, the present study closes a more recent loop, bringing to completion more than a decade of research on the education of lawyers, engineers, clergy, nurses, and physicians. During the same period, the foundation conducted research on the education of scholars through its studies of Ph.D. programs across a number of fields. In those studies, the doctorate was seen as preparation for a life of “professing” and thus parallel in many ways to other forms of professional preparation. With this body of work on professional education now complete, it seems fitting to look back on a century of research and reflection while also looking ahead

to the volume you are about to read and its vision for the future.

On a more personal level, the present volume represents the keeping of a promise I made to Carnegie Foundation board members at my first meeting with them in early 1997. I explained that I admired the accomplishments of the foundation during its then ninety-two years of existence. Nevertheless, I expected that my efforts would be devoted in part to undoing the unintended consequences of some of the foundation's most successful historical contributions to the field of education—including the Flexner Report.

Looking back, it is clear that the foundation's many studies and recommendations created important solutions to major problems at the time. But what is also clear is that the very act of resolving one era's problems often contributed to the dilemmas of the next generation. This dynamic generally entailed transforming what was badly organized or even chaotic by establishing greater standardization and regulation. Thus, the Carnegie Unit addressed the pressing need for a clear distinction between secondary and higher education by setting new and higher standards for both graduation from high school and admission to colleges and universities. It did so by legitimizing a metric that defined the rigor of a secondary school education in terms of the length and intensity of each course that constituted its program. Unfortunately, in doing so it reified the value of "seat time" as a measure of academic rigor instead of looking to students' actual learning as the real gold standard.

A similar dynamic appears in the case of the Flexner Report, which addressed the problem of an utterly unregulated medical education dominated by schools of poor quality. Typically, that poor quality was a function of little or no teaching of modern science, poor prerequisites

for admission and promotion, and far too few connections between serious academic work and carefully supervised clinical learning of medical practice in exemplary hospitals. The report was so hard-hitting in its critique and recommendations that within a few years many schools had closed. Flexner reports that, in the thirty years after the publication of his report, the number of American medical schools had been reduced from 155 to about 60 (Flexner, 1943, p. 113). That may be good news for the most part, but the reduction in size brought with it the demise of all but two of the medical schools that prepared black physicians and all but one that devoted its attention to preparing women for medical careers. Ultimately, the "Flexner curriculum" became a problem in itself, one that the authors of the present report address in their work.

Abraham Flexner developed a very special relationship with Henry Pritchett. Although they had never met before that auspicious day in 1908 when Pritchett invited Mr. Flexner to conduct the study of medical education, they subsequently became lifelong friends. So close was their friendship, and so trusting the bond, that upon Pritchett's death in August 1939, his widow asked Flexner to prepare his biography. In that biography, Flexner describes that initial meeting.

> On the basis of a small book, which I had written on the subject of the American College and which Pritchett liked, I was fortunate enough to be chosen by Pritchett in 1908 to make the study of medical education in America, subsequently in Europe. At our first interview, he asked me whether I would be willing to study the subject.
>
> I answered, "I am not a physician; aren't you confusing me with my brother Simon at the Rockefeller Institute for Medical Research?"

> “No,” rejoined Pritchett. “I know your brother well. What I have in mind is not a medical study, but an educational one. Medical schools are schools and must be judged as such. For that, a very sketchy notion of the main functions of the various departments suffices. That you or any other intelligent layman can readily acquire. Such a study as I have in mind takes that for granted. Henceforth, these institutions must be viewed from the standpoint of education. Are they so equipped and conducted as to be able to train students to be efficient physicians, surgeons, and so on?” (Flexner 1943, pp. 108-109)

In his directive to Flexner, Pritchett thus defined the character of Carnegie Foundation studies for the next century. They were not to be studies by insiders for insiders. They were to be conducted by nonspecialists (or, as became more frequently the case, by a combination of specialists and nonspecialists) and addressed to a larger audience than that within the profession alone. Moreover, it would not be sufficient for the study to be conducted by convening a panel of widely admired sages and tapping their acquired wisdom. Instead, Flexner described the process as *ambulando discimus,* “we learn by going about.” In this spirit, he engaged in two years of travel, observation, interview, interrogation, espionage, deliberation, and advisement; he learned, in short, by “going about,” personally visiting every one of the 155 medical schools in the country. In so doing, he revolutionized our conception of the special report and policy analysis.

I do not, it should be said, use the term “espionage” gratuitously. In one case, Flexner describes the challenge of adequately inspecting the facilities of an osteopathic medical school in Des Moines because, as he toured the facility “in company with its dean, every door was locked and the janitor, who had possession of the keys, could not

be found.” There were signs on the doors that labeled the locked rooms as “laboratories,” “histology,” “anatomy,” and the like. After getting rid of the dean at the railroad station, Flexner made a stealthy return to the school, finding the missing janitor and using a five-dollar bill to induce him to open every room. The signs on the doors not withstanding, the rooms turned out to be quite empty of any evidence supporting their putative uses. Sometimes, it seems, we learn both by going around and by sneaking around—though I am confident that the present research team had no need to employ such methods of investigation.

Among the legacies left by the Flexner Report—beyond its impact on medical education—is the field-based policy report. Instead of simply convening a panel of recognized experts to deliberate about an issue of educational policy, Flexner and Pritchett determined to learn by “going about,” by moving out into the field to visit the places and people in question. That said, the report was in many ways already shaped before the first site visit. Flexner had determined that the template for judging all medical schools would be Johns Hopkins, with its academic rigor, its teaching hospitals, and the quality of its full-time faculty.

A further legacy of Flexner is the practice of educational evaluation conducted through the eyes of the legitimate outsider. Once the study was defined as an educational one, not only was Flexner legitimated as a judge, but, by the same standard, an exclusively insider’s view was disqualified.

Like Flexner, our research team also accomplished much of its learning by going about. They visited medical schools across the country that were selected because we had reason to believe that they were already employing exemplary practices. We did not use any one of them as a model of the ideal program, as Flexner had used Johns

Hopkins; rather, the team saw in the schools' varied practices a sort of collective vision of the possible. Thus, the recommendations in the later chapters are not pie-in-the-sky dreams but proposals for activities some version of which are already in place.

In this sense*, ambulando discimus* is not only an apt motto for an approach to the study of medical education but, ironically, also for the signature pedagogies employed by the field: the use of clinical rounds and rotations as the primary basis for physicians to learn medicine by "going around" with more experienced mentors as well as peers as they move from patient to patient, from bedside to bedside, from clinic to clinic, and from hospital to hospital. In this manner, novice physicians study multiple examples of illness and healing, work with diverse medical role models and teachers, and engage with a variety of forms of illness and disability. Like Flexner and his Carnegie successors one hundred years later, physicians learn by going round and round on rounds and rotations.

The themes that cut through the foundation's other recent studies of professional education appear vividly in this report as well. Indeed, we purposely designed the order of our studies to ensure that medicine came last in the sequence rather than first. Ever since Flexner, medicine has served as the "model profession," and most other professions and forms of professional education have been interpreted through the lens of medicine. We began instead with legal education and proceeded through engineering and the clergy before we began our studies of nursing and medical education; the themes that emerged in that sequence pervaded each of the professional fields. In medical education, they included particular attention to the challenge of curricular integration, the essential tension between standardization of curriculum and individualization of instructional opportunities, and the critically central role

of professional and personal identity in learning to become a physician.

The challenges of integration are ubiquitous in medical education. As fields mature, they tend to grow through division and multiplication rather than through synthesis and simplification. New domains are added, new topics are identified, and new specializations are added to the canon. For each addition, there must be a new course, a new rotation, and a new set of journals. Yet medical students are expected to learn all these domains and somehow to connect, combine, and integrate them within their own understandings and their own professional identities. Our team repeatedly identified the need for the medical curriculum and its programs to foster more of these integrations rather than leave the work entirely to the students.

Another needed kind of integration, easily as problematic as the intellectual and technical demands of the work, is a synthesis of the cognitive and the moral aspects of professional work. In every field we studied, we concluded that the most overlooked aspect of professional preparation was the formation of a professional identity with a moral and ethical core of service and responsibility around which the habits of mind and of practice could be organized. We first recognized the importance of professional identity in our studies of legal education and developed better language and examples of the process when we studied the education of clergy. Indeed, the very term *formation* is taken from religious education.

Yet, as soon as one recognizes the need for a coordinated curriculum aimed at deep understanding, complex technical competence, and deeply internalized moral responsibility, it becomes apparent that one size will not fit all. The authors of this report address with skill and sensitivity how the

standardization of an integrated curriculum must be balanced by the affordances of individual adaptation. An integrated curriculum must provide the basis for the formation of individual professional integrity. This is no small challenge.

Quite remarkably, Flexner operated as a solo practitioner. He visited the sites alone and he wrote his report alone, although it was read and critiqued carefully both by leaders of the medical profession and by Pritchett himself. In contrast to Flexner's solo performance, this new Carnegie Foundation study of medical education is an ensemble piece, drawing on multiple disciplines and backgrounds, and involving both insiders and outsiders. Chief among them, as co-leaders of the research program on the education of physicians, are Professor Molly Cooke and Professor David Irby of the University of California, San Francisco (UCSF).

Molly Cooke is a physician who holds the William G. Irwin Endowed Chair as professor of medicine at UCSF as well as serving as director of the Haile T. Debas Academy of Medical Educators at that institution. She has been a pioneer in the treatment of chronically ill HIV/AIDS patients. Her contributions to the teaching of medicine have been recognized through her selection in 2006 as winner of the Robert J. Glaser Award for Excellence in Clinical Teaching by the Association of American Medical Schools, one of the most prestigious national awards in the field of clinical teaching.

David Irby serves as vice dean for medical education at UCSF. He has long been a leader in research in medical education, having been recognized with major awards by

both the National Board of Medical Examiners and the American Educational Research Association for his accomplishments in that field. Holding a doctorate in educational research, Irby brings both theoretical and methodological competence to this study that is, like Flexner's, a profoundly educational inquiry.

Bridget O'Brien joined the study team from the beginning as a graduate research assistant while completing her Ph.D. studies in higher education at the University of California, Berkeley. She rapidly became a full partner in the effort, and, when the research was completed, she joined Cooke and Irby on the faculty of UCSF.

As noted above, this study benefitted from being the last in the foundation's series of comparative investigations of education in the professions. Coming on the heels of our studies of legal education, engineering education, and the preparation of Catholic, Protestant, and Jewish clergy, and concurrent with a study on the preparation of nurses, the research drew on insights from other fields. Moreover, the study team regularly invited scholars from other research programs at the foundation to join in their site visits and to become fellow travelers as they learned by going about.

In that spirit, the fingerprints of William Sullivan and Anne Colby can be found on all parts of this work. Sullivan and Colby served as the overall coordinators for each of the foundation's studies of professional preparation. Bill Sullivan is a philosopher whose career has included as much social science as it has philosophical analysis. He was part of the team that authored the landmark studies *Habits of the Heart* and *The Good Society.* The two editions of his book *Work and Integrity* lay out a conception of the moral foundations of professional work. He was senior author of the Carnegie Foundation's report on legal education, *Educating Lawyers,* and its book on undergraduate liberal

education as preparation for practice, *A New Agenda for Higher Education.*

Anne Colby is a life-span developmental psychologist whose work on moral development and moral learning in children and adults has had great influence internationally. She is co-author of *The Measurement of Moral Judgment* with Lawrence Kohlberg, and her book with William Damon, *Some Do Care,* is a seminal study of adult moral development. More recently, she is co-author of *Educating Citizens* and *Educating for Democracy,* both books part of Carnegie's program on the role of universities in educating for civic and political engagement.

Thus, in place of Abraham Flexner working alone, a century later we have availed ourselves of the talents of an interdisciplinary team including physicians and medical educators, psychologists and philosophers, and scholars of higher education and of professional education. Nevertheless, the work was possible only because we were able to sit "on the shoulders of Flexner," to build our effort on his, whether viewed appreciatively or critically. And we could pursue the work in the context of a century-old research institution whose credibility rested in large measure on the accomplishments of Flexner and Pritchett.

Henry Pritchett dated his introduction to the Flexner Report on April 16, 1910, which was his fifty-third birthday. Perhaps he viewed the report as a kind of birthday gift from his good friend Mr. Flexner, for no publication before or since contributed more to Pritchett's dream of transforming the Carnegie Foundation from a pension fund into a "great agency" for improving education and teaching in all their dimensions. And what a birthday gift it became! Inspired by the quality of the study and the impact of this kind of field-based policy research aimed at the critical evaluation of educational quality, Mr. Carnegie instructed the leaders of

the Carnegie Corporation of New York, his sole philanthropic institution, to add $1,250,000 to the endowment of The Carnegie Foundation for the Advancement of Teaching. In 2010 dollars, this is equivalent to more than $30,000,000 in additional resources for the foundation's work. But even more important, it signaled the formal transformation of the pension program into a world-class research and policy center in education.

Ambulando discimus remains the hallmark of the foundation's work. The gifted scholars who prepared *Educating Physicians* came to the work after "going about" the many fields of study they represent. They sought the advice of many others, both within and outside medicine, and they visited a broad array of institutions, observing and interviewing, surveying and reading. I believe that all those in the field of medical education must take the observations and recommendations of this book seriously and that its insights can be of value to educators outside of the field as well. I commend this fine work to your attention. It has commanded my attention for a number of years. I thank the team and all those who had a part in supporting this superb effort, as I also express my appreciation to Abraham Flexner, on whose shoulders they stand, and to Henry Pritchett, on whose broad shoulders I have been privileged to perch.

Lee S. Shulman, President Emeritus
The Carnegie Foundation for the Advancement of Teaching
Stanford, California

ACKNOWLEDGMENTS

THIS BOOK REPRESENTS more than four years of collaboration. Through fieldwork, generation of ideas, shared writing, and mutual critique, we developed an interdependent process; its product is thus truly a group effort. Accordingly, we list ourselves as authors alphabetically to emphasize that no one of us takes precedence. We hope our audience likewise recognizes and appreciates that in our work and the resulting book we were, and are, an indivisible team.

The team, however, had much by way of assistance, and we gratefully acknowledge the many people who have contributed to the project and book. First among them are the students, residents, faculty members, deans, and hospital CEOs who graciously hosted us; participated in our interviews and focus groups; and allowed us to observe their teaching, medical schools, and teaching hospitals: Atlantic Health; Cambridge Health Alliance; Northwestern University; Henry Ford Health System; Mayo Medical School; Southern Illinois University; University of California, San Francisco; University of Florida; University of Minnesota; University of North Dakota; University of Pennsylvania; University of South Florida; University of Texas Medical Branch, Galveston; and University of Washington.

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Molly Cooke
David M. Irby
Bridget C. O'Brien

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David M. Irby, Ph.D. David M. Irby co-directed the Carnegie Foundation's Study of Medical Education. Irby is vice dean for education and a professor of medicine at the University of California, San Francisco, School of Medicine, where he directs undergraduate, graduate, and continuing medical education programs and heads the Office of Medical Education. He is the recipient of the Distinguished Scholar Award by the American Educational Research Association, the John P. Hubbard Award from the National Board of Medical Examiners, the Daniel C. Tosteson Award for Leadership in Medical Education from Harvard Medical

School and Beth Israel Deaconess Medical Center, the Distinguished Service Award from Graceland University, and the John E. Chapman Medal Award from Vanderbilt University School of Medicine. He earned a doctorate in education from the University of Washington and a master's of divinity from Union Theological Seminary, and he completed a postdoctoral fellowship in academic administration at Harvard Medical School.

Bridget C. O'Brien, Ph.D. Bridget C. O'Brien was a co-equal participant in the Carnegie Foundation's Study of Medical Education, contributing significantly to all aspects of the project, from framing the conceptual questions through the fieldwork and the writing. She is an assistant professor of medicine at the University of California, San Francisco, School of Medicine and a researcher in the Office of Medical Education. O'Brien conducts research on clinical education and teaches in the Health Professions Education Pathway and the Teaching Scholars Program at UCSF. She has a B.S. from Cornell University, a master's from the Haas School of Business at the University of California at Berkeley, and a doctorate from the Graduate School of Education at UC Berkeley.

INTRODUCTION

IN 1910, ABRAHAM FLEXNER articulated the current blueprint for medical education in North America. His report, *Medical Education in the United States and Canada*, is a comprehensive survey of medical education prepared on behalf of The Carnegie Foundation for the Advancement of Teaching and at the request of the American Medical Association's Council on Medical Education. The basic features outlined by Flexner remain in place today: a university-based education consisting of two years of basic sciences and two years of clinical experience in a teaching hospital. Implementation of that blueprint has brought medical education to a high level of excellence. Yet during the past century, along with enormous societal changes, the practice of medicine and its scientific, pharmacological, and technological foundations have been transformed. Now medical education in the United States is at a crossroads: those who teach medical students and residents must choose whether to continue in the direction established more than a hundred years ago or take a fundamentally different course, guided by contemporary innovation and new understanding about how people learn.

Can medical education's illustrious past serve as an adequate guide to a future of excellence? Flexner asserted that scientific inquiry and discovery, not past traditions and practices, should point the way to the future in both medicine and medical education. Today, this admonition seems even more compelling, given the rapid changes in the practice of medicine and an expanded understanding of human learning. New technologies and drugs are radically altering diagnostic and therapeutic options, and physicians

are playing both broader and more specialized roles in an increasingly complex health care system. At the same time, changes in health care delivery, financing, and public policy are leaving millions of Americans without health care, and many health care institutions are gravely underfunded. New discoveries in the learning sciences and changes in the preparation of physicians all argue for the need to reexamine medical education.

Responding to these environmental forces and changes within medicine, virtually every organization within the medical profession is reexamining medical education. The American Medical Association, the Association of American Medical Colleges, the Accreditation Council for Graduate Medical Education, the Accreditation Council for Continuing Medical Education, the Federation of State Medical Boards, the National Board of Medical Examiners, and many specialty boards that license medical specialists are all asking fundamental questions: How can we improve medical education? Can we produce competent and compassionate physicians more efficiently and effectively? How can we reorganize medical education to produce physicians who are able to achieve better health care outcomes for the American people?

It is within this context of self-assessment that, nearly one hundred years after Flexner's landmark study, we undertook an investigation of medical education as part of a larger study of education for the professions, sponsored by The Carnegie Foundation for the Advancement of Teaching. Flexner—his picture hanging prominently in the main room of The Carnegie Foundation for the Advancement of Teaching—became an icon and a companion during our study. As he did, we set out to examine the status of medical education and chart the course for future directions. Following in his large footsteps, we visited medical schools and academic health centers around the country.

Unlike our predecessor, however, we did not find great disparities in the quality of education among the medical schools we visited. Although we were highly selective in choosing which schools to include in our study, and although many of them excel in innovation, we recognize that two important external agents, accrediting and licensing systems.

Without question, medical education today is unlike the enterprise that Flexner investigated in 1909. Today U.S. medical education is characterized by a great deal of educational creativity and innovation. While he would easily understand the current paradigm of physician education as the one he helped to put in place, Flexner would hardly recognize the contemporary practice of medicine,. He would applaud the scientific basis of medicine and the progress that has been made in advancing health. However, he might wonder if the old structures of medical education can continue to support rising challenges, both internal and external, to medical education. As the challenges confronting medical education inevitably increase, a new vision is needed to drive medical education to the next level of excellence. The future demands new approaches to shaping the minds, hands, and hearts of physicians. Fundamental change in medical education will require new curricula, new pedagogies, and new forms of assessment.

Fortunately, this vision is beginning to take shape. Seeds of the future are germinating in innovations in both undergraduate and graduate medical education. As Kenneth Ludmerer points out in *Time to Heal* (1999), the reforms that Flexner advocated were under way well before he issued his critique. Similarly, we observed many innovations in the course of our fieldwork and study of the literature on medical education and the learning sciences. For example, most medical schools have developed integrated coursework for the first two years of study; use web-based

learning resources, simulations, and standardized patients for instruction and assessment; have clearly defined competencies and learning objectives; use small groups in a variety of teaching situations; and are guided by effective educational leadership. Likewise, residency programs are using simulation both in teaching and to assess performance; are beginning to take teamwork skills seriously; and are experimenting with using patient outcomes as an element of the assessment of residents.

However, as did Flexner in his time, we find medical education lacking in many important regards. Medical training is inflexible, excessively long, and not learner-centered. We found that clinical education is overly focused on inpatient clinical experience, supervised by clinical faculty who have less and less time to teach and who have ceded much of their teaching responsibilities to residents, and situated in hospitals with marginal capacity to support their teaching mission. We observed poor connections between formal knowledge and experiential learning and inadequate attention to patient populations, health care delivery, and effectiveness. Students lack a holistic view of patients and often poorly understand nonclinical physician roles. At both the undergraduate and graduate levels, there is insufficient attention to the knowledge and skills required to meet the health care needs of the U.S. population. Residents continue to be assigned to clinical settings on the basis of inpatient service imperatives rather than learner educational needs. Across the continuum, we observed that medical education does not adequately make use of the learning sciences. Finally, time and again we saw that the pace and commercial nature of health care impede inculcation of the fundamental values of the profession.

In response to our findings, we offer this book as a way to build on medical education’s significant strengths, address its problems, and suggest a vision for the future.

The Study Behind the Book

Our study was part of a larger program of research on preparation for the professions, commissioned by The Carnegie Foundation for the Advancement of Teaching. The work was funded by a grant from the Atlantic Philanthropies, and this resulting book is a companion to reports on educating the clergy, lawyers, engineers, and nurses. (See Benner, Sutphen, Leonard, & Day, 2009; Foster, Dahill, Golemon, & Tolentino, 2005; Sheppard, Macatangay, Colby, & Sullivan, 2008; Sullivan, Colby, Wegner, Bond, & Shulman, 2007; see also Sullivan 2004; Sullivan & Rosin, 2008.) The program was initiated by Carnegie's then president, Lee Shulman, and guided by Carnegie senior scholars Anne Colby and William Sullivan.

Flexner went to all 155 of the medical schools in North America in 1909, and he pioneered the site visit as a research tool. After designing the study protocol and receiving approval from human subject review boards of the Carnegie Foundation and the University of California, San Francisco, we visited 11 of the 130 medical schools and teaching hospitals in the United States currently accredited by the Liaison Committee for Medical Education of the Association of American Medical Colleges and three nonuniversity teaching hospitals. (Osteopathic medical schools, which have somewhat different curricula, cost structures, and accreditation, were not included in the study.) Although each site was selected because of interesting educational innovations, we also wanted to survey medical education across institutional type and geographic location. The institutions thus represent the array of research-intensive and community-based medical