Scholar in Residence Report

COGME

Council on Graduate Medical Education
Subcommittee on Medical Education Programs and Financing

Reform in Medical Education

and

Medical Education in the Ambulatory Setting

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Health Resources and Services Administration

HEALTH RESOURCES AND SERVICES ADMINISTRATION "HRSA —Helping Build A Healthier Nation"

The Health Resources and Services Administration has leadership responsibility in the U.S. Public Health Service for health service and resource issues. HRSA pursues its objectives by:

- Supporting states and communities in delivering health care to underserved residents, mothers and children and other groups;
- Participating in the campaign against AIDS;
- Serving as a focal point for federal organ transplant activities;
- Providing leadership in improving health professions training;
- Tracking the supply of health professionals and monitoring their competence through operation of a nationwide data bank on malpractice claims and sanctions; and
- Monitoring developments affecting health facilities, especially those in rural areas.

Council on Graduate Medical Education

Subcommittee on Medical Education Programs and Financing

Reform in Medical Education and Medical Education in the Ambulatory Setting

Scholar in Residence Report

Prepared by:
Dona L. Harris, Ph.D.
Scholar in Residence

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Health Resources and Services Administration
Bureau of Health Professions
Division of Medicine

Pub.No. HRSA-P-DM-91-4

ACKNOWLEDGMENT

The preparation of this Scholar in Residence Report of the Council on Graduate Medical Education (COGME) was assisted greatly by staff of the Council and others. Debbie M. Jackson, M.A., staff liaison for the COGME Medical Education Programs and Financing Subcommittee and Carol S. Gleich, Ph.D., Executive Secretary of COGME were helpful in finalizing the report. Eva Stone, Committee Management Assistant, provided able administrative support.

A special acknowledgment and thanks to Ceal Neally, RPh, who designed the cover, graphics and the layout of this report.

I extend my sincere thanks to the Council, the Subcommittee, and all who contributed to the report.

Dona L. Harris, Ph.D.
Scholar in Residence

TABLE OF CONTENTS

TABLE OF CONTENTS (con't)

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Health Resources and
Services Administration
Rockville MD 20857

PURPOSE

This monograph is the product of formal presentations made at two meetings of the Council on Graduate Medical Education's Subcommittee on Medical Education Programs and Financing. It is also the final project of Dona L. Harris, Ph.D., Scholar in Residence to the Council from September 1, 1989 to September 1, 1991.

The first meeting of the Subcommittee was held on June 18-19, 1990 and addressed REFORM IN MEDICAL EDUCATION. The second meeting was September 26, 1990 and focused on MEDICAL EDUCATION IN THE AMBULATORY SETTING. The contents are provided because of timely national importance and interest. The presentations do not, however, reflect official policy positions of the Council on Graduate Medical Education.

Respectfully submitted,

Neal A. Vanselow

Neal A. Vanselow, M.D.
Chairman
Council on Graduate Medical Education
September, 1991

PREFACE

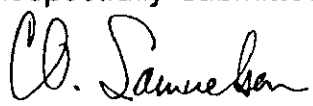
The Subcommittee on Medical Education Programs and Financing of the Council on Graduate Medical Education has had the exciting and enlightening privilege of participating in a number of discussions with outstanding experts and leaders in American medical education. In particular, the Subcommittee listened to a number of formal presentations in June and September of 1990.

Because the topics discussed were not only of broad interest but of significant importance to medical education in the United States, formal presentations by invited experts were made to the Subcommittee. We have felt that there would be a high degree of interest in these materials and are pleased to have the privilege of making them available to you.

The Subcommittee wishes to express its formal and deep appreciation to the presenters whose individual and aggregate contributions have made this monograph possible. It should be pointed out that the views that they express are their own and have not been endorsed as positions of either the Subcommittee or the Council on Graduate Medical Education (COGME). Nevertheless, the Subcommittee did find them to be extremely valuable, thought-provoking, and worthy of our further consideration as well as your own. It is in that spirit of continued consideration and collaboration that we advance them to you.

The Subcommittee has also benefited from the rewarding experience of having the Council's Scholar in Residence, Dona L. Harris, Ph.D., work with us. In addition to organizing the logistical details of the meetings and presentations, she has also been the primary editor and facilitator in bringing this project to conclusion. It is with a high level of appreciation that I express the gratitude and thanks of the Subcommittee members for the effective efforts and valuable contributions of Dr. Harris. We wish her well in her new responsibilities as she leaves COGME.

Respectfully submitted,



Cecil O. Samuelson, M.D.
Chairman
Medical Education Programs and
Financing Subcommittee

COUNCIL ON GRADUATE MEDICAL EDUCATION
SUBCOMMITTEE ON MEDICAL EDUCATION PROGRAMS AND FINANCING

Chairperson

Cecil O. Samuelson, Jr., M.D.
Senior Vice President for Medical Affairs
Intermountain Health Care, Inc.
36 South State Street, 22nd Floor
Salt Lake City, Utah 84111

Members

Dipali V. Apte
Medical Scholars Program
Univ. of Illinois College of Medicine
190 Medical Sciences Building
506 South Matthews
Urbana, IL 61801

Robert G. Eaton
(HCFA Designee)
Assoc. Admin. for Program Dev.
Health Care Financing Admin.
Room 325H, HHH Building
200 Independence Avenue, S.W.
Washington, DC 20201

Lawrence U. Haspel, D.O.
Executive Vice President
Hospital Operations
Chicago College of Osteopathic Medicine
5200 South Ellis Avenue
Chicago, IL 60615

Stuart J. Marylander
Vice Chairman of the Board
NU-Med, Inc.
16633 Ventura Boulevard
Encino, CA 91436

James A. Pittman, Jr., M.D.
Dean
Univ. of Alabama, Birmingham
School of Medicine
University Station
Birmingham, AL 35294

Peter F. Regan, M.D.
(VA Designee)
Assistant Chief Medical Director
for Academic Affairs
Department of Veterans Affairs
810 Vermont Ave., N.W., Room 874
Washington, DC 20420

Margaret T. Stanley, M.H.A.
Administrator
Washington State Health Care
Authority
4505 Woodview Drive, SE, QF 31
Olympia, WA 98504

Charles E. Windsor
President & Chief Executive Officer
St. Mary's Hospital
129 North 8th Street
East St. Louis, IL 62201

Staff Liaison

F. Lawrence Clare, M.D., M.P.H.
Chief, Data Analysis Section
Special Projects and Data Analysis Branch
Division of Medicine
Bureau of Health Professions
Room 4C-25, Parklawn Building
5600 Fishers Lane
Rockville, MD 20857
(301) 443-6326

Scholar in Residence

Dona L. Harris, Ph.D.
Council on Graduate Medical Education
Division of Medicine
Bureau of Health Professions
Room 4C-25, Parklawn Building
5600 Fishers Lane
Rockville, MD 20857
(301) 443-6785

LIST OF COGME SPEAKERS

Leighton E. Cluff, M.D.
Robert Wood Johnson Foundation
P.O. Box 2316
Princeton, NJ 08543-2316

✦✦✦✦✦

Thomas L. Delbanco, M.D.
Director
Division of General Medicine and Primary Care
Beth Israel Hospital
330 Brookline Avenue
Boston, MA 02215

✦✦✦✦✦

Michael J. Gordon, Ph.D.
Department of Family Medicine RF-30
University of Washington
Seattle, WA 98195

✦✦✦✦✦

Louis J. Kettel, M.D.
Vice President for Academic Affairs
Association of American Medical Colleges
1 Dupont Circle, N.W., Suite 200
Washington, DC 20036

✦✦✦✦✦

Howard K. Rabinowitz, M.D.
Jefferson Medical College
Department of Family Medicine
1015 Walnut Street
Philadelphia, PA 19107

✦✦✦✦✦

O.J. Sahler, M.D.
Associate Professor, Pediatrics, Psychiatry, Medical Humanities & Medical Informatics
University of Rochester, Box 690
Strong Memorial Hospital
Rochester, NY 14642

✦✦✦✦✦

W. Douglas Skelton, M.D.
Dean
School of Medicine
Mercer University
1400 Coleman Avenue
Macon, GA 31207

✦✦✦✦✦

August G. Swanson, M.D.
Vice President for Graduate Medical Education & International Programs
Association of American Medical Colleges
1 Dupont Circle, N.W., Suite 200
Washington, DC 20036

Larry Culpepper, M.D.
Associate Professor, Family Medicine
Brown University Memorial Hospital
Family Care Center
89 Pond Street
Pawtucket, RI 02860

✦✦✦✦✦

Daniel M. Fox, Ph.D., President
Milbank Memorial Fund
1 East 75th Street
New York, NY 10021

✦✦✦✦✦

Dona L. Harris, Ph.D.
Vice President for Education
Michigan State University
Kalamazoo Center for Medical Studies
1535 Gull Road, Suite 230
Kalamazoo, MI 49001

✦✦✦✦✦

Christine McGuire
Professor Emerita
Department of Medical Education
Univ. of Illinois College of Medicine
2231 East 67th Street
Chicago, IL 60649

✦✦✦✦✦

David E. Rogers M.D.
Walsh McDermott University
Professor of Medicine
Cornell University Medical College
1300 York Avenue, Room A127
New York, NY 90021

✦✦✦✦✦

Kelley Skeff, M.D., Ph.D.
Department of Medicine (S102)
Stanford University School of Medicine
300 Pasteur Drive
Stanford, CA 94305

✦✦✦✦✦

Parker A. Small, Jr., M.D.
Professor of Immunology and Medical Microbiology
Professor of Pediatrics
University of Florida
College of Medicine
3454 Northwest 12th Avenue
Gainesville, FL 32605

✦✦✦✦✦

Steven A. Wartman, M.D., Ph.D.
Director, Division of General Internal Medicine
Rhode Island Hospital
Professor, Medical & CommunityHealth
Brown University
593 Eddy Street
Providence, RI 02903

REFORM IN

MEDICAL EDUCATION

June 18-19, 1990

Dona L. Harris, Ph.D.
Scholar in Residence

INTRODUCTION

REFORM IN MEDICAL EDUCATION

It is a pleasure to welcome members of the subcommittee, guest speakers, and colleagues to our first meeting on medical education. As you may know, the Council on Graduate Medical Education currently consists of three subcommittees: 1) Medical Education Programs and Financing; 2) Physician Manpower; and 3) Underrepresentation of Minorities in Medicine.

One area that inextricably links all three subcommittees is the character and size of the medical professional pipeline. Our current equity and access problems will continue to drain us, or perhaps keep our committee-work going, if we do not address the pipeline issue. Although we need to look beyond the medical education years, we need to address them first.

Some of the major issues facing medical education today include the following:

1. The declining interest in medicine as a career. This erosion is especially critical with few underrepresented minority physicians currently in practice and very few in the medical education training process.

2. The skyrocketing debts of our graduating medical students. This is also especially linked to the future enrollment of underrepresented minorities.

3. The continuing pockets of physician shortage especially in many rural and urban communities.

4. The steadily decreasing numbers of graduating medical students pursuing primary care careers.

5. The medical knowledge and technology explosion.

6. The severe disparities that exist in pay and reimbursement among medical specialists. In a recent JAMA article, the range of pay was reported to be $87,000 for family physicians to $193,000 for the orthopaedic surgeon.

7. The discussion, movement, and controversy over training in the ambulatory setting.

8. Training focusing on preparing physicians to be businesspersons, litigators, and bureaucrats to the detriment of training physicians to be care-givers, friends, and counselors.

9. The subordination of teaching among medical faculty with primary emphasis on research and clinical income generation, responding to economic incentives, even survival, first.

10. Few institutions have defined their end-products. Many students have no idea what receiving the M.D. means and what skills and responsibilities accompany its possession; nor have institutions made a commitment to serve people within their community.

Yes, the list is long. And the list is not new. In 1909 Eli H. Long, President of the AAMC, pointed out in his president's address that "the greatest deficiency in the conduct of the medical course today is the failure to train the student to think and reason out matters for himself. Medical education," he explained, "should make our graduates thinking and reasoning men rather than encyclopedic men."

Since 1909 there has been much written about medical education reform. Many think the problems with medical education are a result of the curriculum; others think they reflect a problem in the profession of medicine.

In reviewing the most recent Journal of the American Medical Association's issue on medical education, it was noted that some of the 126 medical schools have made curricular changes. In the basic science years, 6 schools have the problem-based track format for the entire class; 2 as its major instruction. Only 69 of the 126 have required family practice clerkships. Most institutions teach with a traditional format of two basic science years and two clinical years, with varying degrees of residency "frequent flying" in the fourth year of medical education.

Many foundations have expressed concern about medical education and have invested dollars in trying to address the most significant issues. The Josiah Macy Foundation supported the preparation and subsequent publication of CLINICAL EDUCATION AND THE DOCTOR OF TOMORROW. In addition many experiments and meetings are currently supported by other foundations including the Robert Wood Johnson, Carnegie, Milbank, Kellogg, Culpeper, and the Pew Charitable Trust.

With so much written on the NEED for reform in medical education, it is time to place some action behind our words. I couldn't help but think of medical education while I was at Harper's Ferry, West Virginia, yesterday. I am sure many of you are familiar with the role John Brown, the abolitionist, played in beginning the Civil War. He became militant and also lost his life pursuing what he strongly believed in. He thought our country was the "discussion" nation, and words weren't solving the slavery issue.

Well, I don't think we should become militant, or lose our lives. But without appropriate changes in medical education, some future lives will be on the line. We do need some action, and that is what I hope we can begin doing today: what can and should we be doing to assure improvement in the medical education process.

We are very fortunate to have assembled so many interested individuals who are experts in medical education. I would like to encourage your interaction. The agenda provides for opportunities for discussion, and I hope none of us misses those opportunities.

David E. Rogers, M.D.
Walsh McDermott University
Professor of Medicine
Cornell University Medical College

THE EDUCATION OF MEDICAL STUDENTS FOR TOMORROW

It is my hope that this will be a no-holds barred discussion--not a series of lectures.

So, first, let me set the stage by giving you some of my views on where we are faltering in medical education today. Second, let me try out some general objectives that I consider as goals of the process. And third, let me share with you some of the recommendations which came out of a Macy Conference I chaired two years ago and see: (a) if they still make sense today; (b) if you feel they make enough sense to try to implement some or all of them.

There is, to my sorrow, considerable and increasing evidence that medical education is in trouble nowadays. Consider the following:

- The number of well-educated college students selecting medicine as a career is falling sharply.

- Too many medical students today are finding their medical school experience an unpleasant trial rather than a treat.

- Too many residents—feeling insecure, unsupported, and under-rewarded in generalist medical careers—are turning to super-specialized fields. In so doing they are often putting a technology-intensive wall between themselves and their patients, and alas, they have plenty of faculty role models to encourage them to do just that.

- And last, and perhaps this should be of greatest concern to medical educators, too much of a more sophisticated public likes doctors much less than in days past. The public characterizes us as too cold, too selfish, too busy, too impatient with them, too uncaring and making too much money.

The fact that medicine is simply not viewed as being as attractive a life role as previously probably stems from multiple changes in our world. Those changes include an increasingly regulatory climate surrounding medicine; the disappearance of the solo entrepreneurial practice and its replacement with massive, bureaucratic, high-technology institutions; and a disturbingly litigious patient population. All of these are part of it.

But I am afraid there is also considerable evidence to suggest that medical school experiences per se contribute to this loss of appeal, and that much of what we do in our teaching programs is outdated, too expensive, too pedantic and out of sync--socially, factually, and pedagogically with the needs of our times.

All of this comes as no surprise to any of you. Medical faculty have been scolded, lectured, and white-papered to death about their pedagogical sins and misdeeds. Multiple distinguished commissions, task forces, and committees have told us to mend our ways. But despite all the rhetoric, startlingly little change has occurred.

Why has this been so? I believe that the reasons for this recalcitrance are obvious, but both we and our critics have been surprisingly quiet about them. They are three—and all compelling and fundamental. First, there have been precious few faculty-oriented incentives to encourage change in our educational program. Indeed, most of the incentives have been perverse. There are significant hazards to life, limb, and career advancement awaiting faculty who wish to spend significant time on teaching or improvement of curriculum. The worldly rewards for such endeavors are few, if not nonexistent. All faculty know this very well, and this reality has been amply documented. Being an educator is not what gets a faculty member brownie

points in medical academe.

The second reason for lack of change, though we hate to surface this one, is the fact that the medical school establishment has become the child—if not the ward—of the public sector.

First by becoming dependent on federal largess for our research ventures, then by accepting federal monetary rewards for taking in more students, and finally by using federal and state monies to pay our clinical faculty very generously (with funds from programs legislated to support care for the elderly, the poor, women and children without means, and the disabled), we gave away much of our capacity to act independently. The fact that the major payer of the bills wanted an increasing say about the tune to be played should not surprise us. To change medical education now requires changing not only ourselves but also federal and state attitudes and funding streams.

And last and most mortifying, by our failure to guard our precious responsibilities for the educational independence of institutions giving the MD degree, we gave away much of the store and sharply restricted our opportunities to try innovative or risky experiments in admission and education. We did so by giving external bodies—examining groups and specialty boards--the final say in what the doctor should be. Thus today we have medical institutions comparing themselves or jockeying for position on the basis of the Medical College Admission Test averages of those they admit. Incredible! Further, to pretend that National Board scores—or even the percentage of a school's students passing National Board examinations—represents some kind of Good Housekeeping Seal of Approval demonstrating a school's educational excellence seems to me a declaration of educational bankruptcy! This situation could be swiftly changed if we decided we wished to; but faculty are startlingly lethargic when it comes to curricular reform.

Let me cite a verity: No faculty will listen to what authorities espouse for change, no matter how exalted, unless it is clear to them that the change will improve the life and lot of that faculty. Unless this is crystal clear, any recommendations no matter how inspired, will go the way of those preceding them. Faculty do not need more berating; they need encouragement, rewards, and fun in their teaching lives.

So what might be our general educational objectives? In talking with Cornell faculty recently I listed seven. Let me try them out on you.

First, it is to help students learn the language of medicine and something of the disciplines that are its underpinnings. Despite the apparent simplicity of this statement, this is no small task. The languages of anatomy, of biochemistry, of physiology, of pathology, of molecular biology, are demanding and complex.

Second, it is to introduce young men and women to the ways of science. We want them to gain familiarity with the tools that can and are being used to explore problems in modern biology and, most important, to understand and respect the nature of scientific evidence with all that this implies.

Third, we hope to help students learn ways of reasoning logically, deductively, and accurately. They must learn to work swiftly from available evidence toward both the formulation of a problem and its solution. This is a difficult task in medicine. Physicians must acquire both the ability and the reasonable comfort required to deal with ambiguities, uncertainties, and gaps in knowledge when the stakes are often very high. Despite those uncertainties, they must formulate and make decisions-often decisions with profound human implications.

Fourth, we wish to help students become good communicators. We want them to learn ways of interacting with other human beings of widely varying backgrounds, cultures, and value systems, so that they can better understand and deal with the problems of illness and human misery that are brought to them.

Fifth, and it builds on the above, we hope to expand the individual student's capacities for constructive empathy, helping others by the use of his or her own compassion. Doctors need sensitive antennae to know how those who are patients feel about their problems, and, in so doing, help them strengthen their own coping skills.

Sixth, though there is less general agreement on this point, some of us feel we should strive to turn out physicians whose social concerns extend well beyond just the delivery of care to those who seek it. It is my view that doctors' concerns should also encompass the needs of those who do not find their way to services because of ignorance, or poverty, or isolation. I believe that physicians, with their privileges of special knowledge and command of powerful technologies, should have a serious commitment to use those skills and insights to improve the broader human condition.

And last, we hope to inculcate in each and every doctor we turn out a personal love of learning and the habits required to be a continuing learner. This implies development of an internal set of standards, of continuing curiosity, and a feeling of almost sacred obligation to keep up, that will allow the physician to stay abreast of the new developments which will keep coming swiftly during his or her professional lifetime. The doctor who graduates today must be knowledgeable and current ten to twenty to thirty years from now.

Can we get more specific? Sure. Here seem to me some desirable attributes of doctors.

- Our nation needs doctors with a broader and more sensitive view of the place and role of medicine in the larger society. Doctors will need more skills with which to assess the efficacy of medical interventions and the relative contributions of medicine to the health of society.

- Our nation needs doctors who are more skillful in doctor-patient relationships. We should introduce a better blend of humanism and science into our health care institutions and the students they graduate.

- Modern physicians should pay more attention to health promotion, disease prevention, and the social, environmental, and emotional factors bearing on health.

- Both the physicians who graduate and the academic medical institutions that produce them should have a strong sense of social responsibility for the health and medical care rendered in their communities. It is of particular concern that inadequate funding of health care for the poor most severely affects those medical schools whose clinical and educational missions focus on service to indigent and minority groups.

How might we do these things? Let me give you the suggestions we came up with at that conference and then see where we might go from there:

1. Centralize control of the curriculum. Create at each medical school an appropriate central unit that has authority to plan, organize, monitor, evaluate, and continuously revise the curriculum. Give the unit significant status and the power to act. Specifically and visibly fund it from appropriate sources, including clinical practice monies.

2. Make residency programs the responsibility of medical schools.

   Medical education is currently divided into two separate and often poorly related programs—one undergraduate (medical school), the other graduate (residency). The two are supported by different sources of funds and administered by different institutions. This separation has produced an artificial dichotomy between the undergraduate and graduate experiences, perhaps has lengthened training time, and has caused overemphasis on the training of inpatient specialists and underemphasis on training in ambulatory care settings. Clearly, the two

parts of medical education are already much intertwined. In clinical settings, students and residents generally learn side by side, with the former receiving much of their training from the latter. If medical school education is ungraded and strengthened in the ways I recommend, perhaps putting residency programs under the jurisdiction of medical schools and consolidating the continuum of undergraduate and graduate medical education would make sense.

3. To facilitate educational innovation, have the National Board of Medical Examiners report scores on its tests only on a pass/fail basis. Likewise, have the Association of American Medical Colleges report performance on the Medical College Admission Tests only as being above or below preestablished levels determined in consultation with medical schools.

4. Move more training, and consider moving the base of training in certain primary care specialties, to ambulatory care settings. Negotiate with public and private funders of care to shift some funds from inpatient to outpatient programs to permit such education to occur.

5. Require a period of community service as part of becoming a doctor.

6. Require medical students to pass comprehensive, performance-based clinical examinations. This is a sneaky recommendation of enormous potential power and we should talk more about it in our discussions.

   All medical schools should conduct performance-based clinical examinations in which students interview and examine standardized and/or simulated patients and demonstrate their ability to apply the information obtained. These examinations could be conducted periodically throughout clinical training to foster the educational process as well as to assess its results.

During the first 75 years of this century, the United States developed a biomedical science capacity and a process for the training of physicians that made America the envy of the world. Indeed, American medical education retains its primacy today. But now, there is abundant and increasing evidence that American medical education is not keeping pace with the swift changes in the way medical care is organized and delivered and with the technologies that have so revolutionized medical practice. It is a worrisome paradox that although remarkable recent achievements in biomedical science have vastly increased physicians' ability to better the lot of the sick, medicine is waning in its attractiveness to the young.

Thus, recasting medical education to better meet the needs of the students and physicians of tomorrow seems worth all of the enormous effort it will take.

Christine McGuire
Professor Emerita
Department of Medical Education
College of Medicine
University of Illinois

WHY MEDICAL EDUCATION HAS NOT CHANGED

I confess that I may be here under false pretenses. I have not even admitted to the organizer of this meeting that in trying to deal with my assigned topic, I feel almost as disoriented as the confused speaker who arrived at the wrong auditorium, dropped a quarter for parking in the mailbox, looked up at the town clock and cried: "My goodness, I'm ten pounds over weight". My topic requires that I, as he, assume a basic fact not in evidence--in my case, but that there has been no significant change in medical education in recent decades. But I cannot accept that thesis; rather my plea, will be analogous to that offered by another victim who, on being accused of breaking the lawn mower he had borrowed from his neighbor, argued successively that the mower was broken when he got it, was perfectly OK when he returned it, and that anyway it wasn't a recognizable lawn mower in the first place.

Analogously I shall propose first, that since World War II, medical education has, in fact, been altered so much as to be hardly recognizable to earlier generations of physicians; second, that what appears to be fundamental change over the course of the last fifty years has been nothing more than forced responses to uncontrolled and uncontrollable social forces and third, that in any case, the obstacles to deliberate, planned, rational change in medical education are so great as to guarantee that nothing significant could have been accomplished even if anybody had been strongly motivated to try. After clarifying major ambiguities in this seeming contradiction, I shall devote the balance of my discussion to a consideration of conditions and strategies for bringing about greater congruence between medical education and medical practice.

Examples of Change

Consider first the changes--actually spectacular in number, variety and scope--that have occurred at every level of the medical education continuum. For example: There are, of course, those relatively few, but somewhat over publicized experiments in integrated, problem oriented, community-based, student centered and/or independent study programs in the basic sciences. But for the most part these have been short lived except in new schools that have had the luxury of selecting sympatico faculty or in old schools on the brink of failure; in well established, traditional schools this radical reform has succeeded even temporarily only as an alternate track.

A more widespread "reform" in the teaching of the basic sciences has been the virtual elimination of what was once literally hundreds of hours of laboratory exercises, often replaced by extended lecture hours. And in both basic and clinical sciences we have seen the curriculum expanding out of control with the addition of new content in all areas, ranging from genetics to geriatrics and from molecular biology to medical ethics.

There have been the fitful variations we have observed in the length of both undergraduate and graduate programs, with the former pegged at 4 years, then 3, then back to 4, with an occasional 6 year combined MD-Ph.D. program thrown in, while the graduate training has been inexorably lengthened from an average one year internship to what is now a relatively common 5 or even 7 year combined residency and fellowship, followed by a rising tide of mandated Category I requirements that is only now beginning to recede.

The expansion in content and length of programs has been associated with a proliferation of specialties and sub-specialties, accompanied by earlier and earlier curricular differentiation, in which the ideal of "holistic medicine" has become merely a buzz word that conceals its having been lost in the conversion of the fourth year from an integrative experience in basic, general, clinical medicine to a repetitive series of specialized electives deliberately chosen to enhance residency opportunities--a change, the effects of which have been exacerbated by the simultaneous evolution of the rotating internship into the PGY-1 year of a specialized residency.

With respect to financing and control there have been such radical changes that today's fledgling physicians would have difficulty recognizing the conditions of my husband's training as being in the same professions. As a medical student, Jules' annual tuition fees totalled $300/year. His starting remuneration as a rotating intern was $25/month plus laundry; over the succeeding four years of residency at Stanford and a Fellowship at Hopkins his monthly salary rose to a princely $100 minus expenses for his laundry. True, bread, wine and cheese were considerably cheaper in what he calls the Pleistocene age, but after discounting for inflation, his final salary was hardly enough to support a wife, let alone a family. However, that issue was moot in any case, since promising medical students in those days were often tactfully "counselled" that marriage would be a significant obstacle to desirable internship appointments. Protests against these, or any other conditions of training and employment--such as hours on call, nights on duty, etc.--were simply unthinkable in those days, when both the personal and the professional life of the trainee were under the full control of an autocratic "Chief". From $25/month to $25,000/year, and from dictatorial control to protection by unions and state legislators are, I submit, significant changes!

However, even more important than changes in financing and locus of control has been the revolution in the patient population available for teaching, wrought by the introduction of Medicare and Medicaid, and the evolution in the setting for learning consequent on the growth of the great academic medical centers. These changes, taken together, have conspired to alter permanently the kinds of medical problems which trainees see, the character and scope of their responsibilities for resolving those problems and the nature of the available resources for doing so. The university teaching hospital of the sixties has been transformed into the academic medical center of the eighties where, according to Dr. Marjorie Wilson, now President of ECFMG, the medical student has been pushed away from the bedside by the swarms of residents and fellows in the "more crowded, more impersonal, more hurried, much larger, and much, much more complex institution."[1]

These changes in the content, structure, organization, financing and setting of instructional programs have, interestingly enough, been associated with sweeping reforms in the procedures and techniques for student assessment during training, and for licensure and certification of professional competence and readiness to practice a specialty at the end of training.[2] Unlike other changes these reforms in the methods of assessment have often been based on research, and have included both introduction of new techniques such as those pioneered by Orthopedic Surgery and recently extended by Family Practice and Emergency Medicine [i.e., replacement of traditional interview oral and essay examinations with objective written, oral, practical and computer simulations], as well as system-wide changes such as those in internal medicine which now requires that the training director provide reliable, valid and objective evidence about the habits, attitudes, values and skills of his trainees.

Along with modifications in programs and the methods of assessing their products we have seen the faculty in most schools transformed from a part-time volunteer staff to a full-time, salaried one, supported by at least token departments or offices of research in medical education

and "developed" with many faddish faculty training workshops--all purportedly evidence of a devotion to constant improvement in medical education.

No Fundamental Change

But dramatic as these and other modifications in the training of physicians appear, their critical appraisal makes it hard to escape the conclusion that all of the above has been merely directionless, Brownian movement representing no fundamental reform in the system of medical education, still cast in the basic Flexnerian mold; namely, 2 years more or less of basic science under the tutelage of a full-time, research-oriented, Ph.D. faculty, followed by 2 years of clinical medicine under the mentorship of service-oriented clinicians, leading to one or more years of in-hospital apprenticeship training eventually capped, hopefully, by lifelong individual efforts to "keep up". Progress, if any, has been limited to incorporation of the new knowledge and the new technology furnished by biomedical research.

If Not, Why Not?

What's more, some would argue that it is unrealistic to have expected anything else, given the following intrinsic obstacles to change in our educational institutions.

First, education is not seen as the primary mission of most of our colleges of medicine, which are understandably compelled by many forces--social, political and financial--to give priority to research and patient care.

Second, the organization of universities is such as to make it virtually impossible for a faculty to assume corporate responsibility for its education programs which, at every stage, but especially at the graduate and continuing levels, tend to be under the jurisdiction of semi-autonomous departments, themselves answerable to non-faculty professional associations and other more or less voluntary regulatory agencies and, at most locales, subject only to pro-forma faculty control, at most.

Third, contrary to the situation in industry and in clinical medicine where it has been reliably estimated that it takes on average three to five years for a discovery to be generally disseminated, in education, it takes on average about 20 to 25 years for a research finding to become widely applied even in public schools, manned by professional educators. There are several reasons for this: There is a kind of built in planned obsolescence in the market for goods and services, which carries inherent financial and other penalties for those who fail to "keep up", not so in the world of ideas! Furthermore, progress in industry and in clinical medicine involves acquiring new <u>things</u>—a car, a pill, a surgical procedure, whereas, for the most part, progress in education involves <u>a new way of behaving</u>--a new life-style--and that is always and everywhere resistant to change.

Fourth, there has rarely been any real motivation to change: while it is true that there was a temporary furor in medical education in the late fifties and early sixties, occasioned by what appeared to be the loss of bright scientifically talented students to the more glamorous pursuits of nuclear physics and the like, minorities (especially women) soon filled the hiatus created by the desertions to other scientific endeavors, and complacency once again set in, to remain undisturbed until the relatively recent reductions in the applicant pool at both undergraduate and graduate levels. If institutions now begin to hurt enough that may turn out to be the stimulus to genuine reform.

A Strategy for Comprehensive Reform

If so, fundamental reform may be possible; but it will need to begin with identification and clarification of the school's mission.

On the face of it the goal of any medical school is fairly obvious: It is to prepare students and housestaff to function effectively in the existing health care delivery system so as to resolve, with

the limits of current knowledge and resources, the health problems the world's population will face in the coming decades. The development of either broad strategies or of specific curricular and instructional systems to fulfill that mission requires that a faculty give systematic attention to the following vectors: (1) The emerging health needs of society at large, (2) the constraints imposed by the evolving nature of the profession itself, and (3) the consequent changes in the individual needs and special requirements of trainees. Let us speculate briefly about what the future will bring in each of these arenas.

Societal Needs

Among the specific threats, already apparent, that our graduates must be prepared to meet, I shall enumerate only a bare half dozen of particular concern, that are certain to escalate in the coming decades:

First, **Problems of an Aging Population**: Though now most acute in the West, the age distribution of the population is also shifting even in some developing countries in response to limited improvements in sanitation and nutrition, and to modifications in public policy and social norms such as the "one child per family" campaign of China.

Second, **The AIDS Epidemic**: There is already a steadily escalating need, world-wide to provide sufferers with necessary supportive therapy and to counsel them and their immediate associates on risk reduction behaviors, while simultaneously expanding our research effort to eliminate this plague.

Third, **Substance Abuse**: Despite our widely heralded "war on drugs", there is very little evidence that this global scourge and the fetal defects and neonatal addictions associated with it are being effectively controlled; instead, young people, across the entire social spectrum, are being recruited into the drug culture at earlier and earlier ages. We can no longer afford the ensuing human tragedies.

Fourth, **An Increasingly Diverse Population**: Physicians in the U.S., as in other Western countries, must be prepared to deal with unfamiliar problems that a more heterogeneous population may present. As immigration from third world nations increases, and as travel between developing and developed regions expands, diseases which are pandemic elsewhere may become endemic in the West. We are already experiencing some of these problems in the resurgence of tuberculosis and of various childhood afflictions which, until recently, we thought we had essentially conquered. Furthermore, the stresses (both physical and emotional) imposed by mass migrations stimulated by both political and economic conditions, continue to intensify tensions and resentments in both host and refugee populations. Our health care system will increasingly be called on to help mitigate these problems.

Fifth, **Pollution and its Consequences**: Given the rate which we are poisoning our environment, overt and covert toxicoses, and the associated damage to our genetic pool, will almost certainly emerge as major health problems in the 21st century, unless we <u>now</u> educate our physicians to take a pro-active role in preventing this catastrophe, while mitigating the effects of what they are unable to prevent.

Sixth, **A Technology Spiraling Out of Control**: The current revolution in the organization of work is a magnitude that rivals the Industrial Revolution. These occupational changes are now proceeding at a pace which increasing numbers of workers find beyond their adaptive capacity. The resulting pressures, together with our failure to cope with a pyramiding technology, have engendered physical and emotional stresses that our physicians must be prepared to help relieve.

And, though worldwide anxiety about confrontation between the major power may have temporarily abated, covert concerns about the potential for atomic genocide may actually have been exacerbated as a consequence of nuclear

proliferation among small nations and terrorist groups. Even if we manage to avoid what has been called "the ultimate epidemic"--fear of it will continue to engender disabling psychosomatic and behavioral dysfunctions that may, unless countered by rational statesmanship, eventually overshadow all other health problems.

Professional Needs

The foregoing constitutes a very partial list of the escalating problems which our current students must be prepared to help resolve. But they must learn to do so within the constraints imposed by the evolving nature of the medical profession and the institutional context in which it is practiced. The following are of special relevance to us as medical educators:

The Nature of Medical Decision-making. Most of us like to believe that medicine is (or should be) a scientific discipline. We therefore expect that patients presenting with the same or closely similar symptoms will be assigned more or less the same diagnostic label, under optimal circumstances, be provided more or less the same therapeutic regime.

Not so! Operationally, it's not how sick you are but where you are when you get sick that determines what diagnosis you are given and what kind of treatment you will receive. This disconcerting conclusion was reached in a challenging little book by Lynn Payer, entitled Medicine and Culture,[3] in which she compares diagnoses and treatment in England, West Germany, France and the United States. According to Ms. Payer, the same clinical manifestations may receive quite different diagnoses in different countries, drug dosage may vary by ten to twenty-fold, and the frequency of specified surgical procedures by a factor of four to six. For example, an American complaining of chest pain is six times more likely to have coronary bypass surgery than his British counterpart, who more often receives a prescription for anti-anginal medication. Similar differences have also been documented among adjacent areas within the U.S. where they have been explained as due more to variations in the number of physicians, their specialties and the "procedures they preferred than on the health of the [local] residents".[4] I think we can all agree that such an approach to medical decision-making is unacceptable, and that unless we, as medical educators, take responsibility for altering the process, the situation is likely to get much worse in a rapidly changing milieu. And that brings us to:

The "Knowledge Explosion". Cliche though it may have become, it is nonetheless essential to recognize that acceleration in the rate of expansion of the knowledge base has altered forever the character of the medical profession and its educational requirements. Knowledge, now doubling every five to eight years, is reliably predicted to begin shortly to double every year! Unless we starve it out by deliberately withholding research funds, or kill it off with a global disaster, medical knowledge will keep on growing exponentially, in accord with a kind of perverse Malthusian law. We cannot, in response, simply keep adding to an already overcrowded curriculum; we must, instead help students to develop a new strategy for dealing with the sheer volume of data, concepts, principles and skills that health providers should have at their command.

Computer-Managed Information. One option is to rely heavily on computers rather than human memory for the storage and retrieval of information and for expert systems to support clinical decision-making. The curricular implications are obvious, but the consequences for the nature of professional practice are less so. Some are concerned that such a system will restrict physician autonomy, in that doctors are already being called on to defend deviations from computer-directed protocols; others fear the potentially dehumanizing effects of computer-mediated diagnosis, therapy and prognosis, and point to the frustration and alienation patients even now feel in a world that seems driven by stereotyped forms and procedures.

Specialization. An alternative strategy for

coping with the ever expanding body of knowledge consists in increased specialization and division of labor, with correspondingly earlier differentiation in the curriculum. However, in industry this has threatened the elimination of the master craftsman, and some worry that such a "de-skilling" process could also overtake medicine, where paraprofessionals and technicians are already performing tasks previously reserved for physicians.

Bureaucratization. In medicine such so-called de-skilling processes have been associated with the bureaucratization of medical practice and with a rapid trend away from the traditional physician-as-entrepreneur to the physician-as-employee. Though the idea of the professional as entrepreneur may be merely a nostalgic view of a fantasied past, even that ideal is rapidly fading. Today, approximately half of U.S. physicians are affiliated with at least one HMO or PRO and some are associated with as many as six. Excluding federal employment in hospitals, the military and the government, 25% of physicians engaged in patient care are now employees in non-federal entities. This trend is especially significant among those under 36 and among women, for each of which groups the percentage of employee physicians has reached almost 50%.[5]

In and of itself growth in the numbers of employed physicians is not necessarily very significant. However, as they become employees of increasingly ritualized bureaucracies, the work of the physician becomes subject to the control of commercial firms, which of necessity, must serve the interests of the owners. With the advent of nationwide chains of for-profit corporations, some authors predict that the increasing bureaucratization of medical practice will lead eventually to the alienation of physicians and to their ultimate proletarianization.[6]

Diminished Autonomy. But it is not alone the role of the employee that has limited the autonomy of the physician and restricted the scope of individual decision-making; it is also the prevalence of third-party payers--whether private insurer, Medicare or Medicaid. The physician of today, tomorrow and the foreseeable future is, and is going to continue to be, accountable to an impassive computer or faceless clerk in the office of the patient's insurer; physicians who wish to provide optimal care to their patients must therefore be prepared to spend what will seem like interminable hours in searching for the key words that will trigger the computer's permission and/or in explaining to an anonymously programmed clerk the rationale for a proposed plan of management and the reasons for departing from the prescribed protocol. It will not be fun, and it will require that our graduates develop not only patience, but also consummate skills in communicating with both unresponsive machines and disinterested lay personnel.

The Intensification of Ethical Dilemmas. This same inexorable march of science has also made ever more sophisticated technologies available for lengthening life (or, as some would have it, prolonging death)--a development that promises to confront our graduates with new and ever more difficult moral and philosophic dilemmas. Systematic curricular attention to methods for resolving these ethical problems is indispensable to the mental health of both physicians and their patients.

The Legislation-Litigation Crisis. Ironically, these increasingly intense ethical dilemmas are occurring at precisely the moment of tightening restrictions on physician autonomy--a convergence of forces that in many countries (especially our own) has led to a flurry of legislation and a crisis of litigation.

In response to what appears to be a terminal weakening of informal social controls traditionally enforced by peer pressure, we are seeing the imposition of a variety of formal mechanisms (laws, administrative rules and court procedures) designed to govern, examine, judge and, if necessary, correct and control the scientific and technical standards professionals observe in their work. Where once we accused physicians of a "conspiracy of silence" we now have "informer laws" that require them to report negligence on the part of colleagues; failure to do

so is itself considered not only a breach of ethical standards, but prima facie evidence of professional malpractice.

In concert with the expansion of legislative regulation we have seen over the last decade a disastrous increase in litigation brought both by physicians and against them: students suing medical schools for admission, trainees suing credentialling authorities for licensure and/or specialty certification, physicians suing hospitals for staff appointments, practitioners suing peer review groups for adverse reports and, perhaps most damaging of all, patients and their families suing health care providers for what they regard as deleterious results. This burgeoning litigation seriously impairs relationships with colleagues and patients, invites governmental intervention in highly technical decisions and discourages many dedicated and humane young people from entering the profession.

Educational programs designed to inculcate standards of professional conduct may retard, but cannot alone halt, the trend toward substitution of formal legislative, judicial and bureaucratic edicts for the informal social, cultural and scientific controls on which we were once able to rely. It is therefore imperative that our students learn to collaborate as physicians with lawmakers, attorneys, jurists and groups of patient advocates, to curb these threats to mutually responsible and responsive health care.

From Collegial to Competitive Relations. Equally unfortunate in my view is the related development in our legal system which requires that health care be treated as a business, and which increasingly equates provision of a professional service with ordinary commerce. As a consequence, collegial collaboration characteristic of genuine professions is more and more being replaced by competitive relations that rely on the "discipline of the market place". Clearly the barrage of ads touting the virtues of one clinic over another, and the increasing emphasis on business and administrative skills in the conduct of a professional practice, support the notion that the business model is replacing the service model among providers as well as consumers of many professional services. Even our language, in employing such words as "provider" and "consumer", underscores the shift toward commercialism.

Further, some professional societies reinforce this business image by furnishing members with multi-media kits that talk openly about public relations, marketing, promotion, working with the media, outreach programs for "patient recruitment: and the like.[7] This approach seems to imply that no amount of humane and expert patient care will compensate for a physician's failure to make fundamental changes in the way he or she "does business". Some sociologists argue that competition in the form of advertising is inherently a claim of superiority that necessarily denigrates competitors.[8] They further assert that, partly as a result of the ensuing deterioration in collegial relations, and partly as a consequence of changes in scale, there is serious danger of a collapse in the norms governing the way colleagues evaluate and control each other. Clearly, any failure of traditional socialization processes to transmit traditional professional values will only exacerbate the trend toward increasing reliance on laws, bureaucratic rules and court procedure, unless educational institutions succeed in taking greater responsibility for systematically inculcating appropriate standards of professional practice in their trainees.

Increased Managerial and Leadership Responsibilities. The business metaphor now extends from the office to the health care "industry". No one any longer doubts that the future of the medical profession requires that practitioners develop expert managerial and leadership skills. Whether in organizing an office practice, managing a clinic, leading public interest groups, or planning a total health care system, physicians with leadership talents and administrative skills are urgently needed to guide and implement health policy at every level.

Individual Needs

What impact have these changes in the nature and demands of the profession had on persons seeking entry to it? We do know that fewer young people are applying to medical school and aspiring to careers in medicine; we also know that a high proportion of those who do apply are women;* whether the characteristics of current applicants differ in any other significant way from those of recent years is less certain. However, we can be sure that, to the extent that the trends outlined above are obtained, medicine will eventually become less attractive to persons who are looking for autonomy and independence, and more attractive to those seeking security of one kind or another, especially if they also have a high tolerance for frustration.

At the very least the changes outlined above will mean that medical educators must be prepared to consider applicants and to work with students whose preparation, motivations and talents for the study and practice of medicine differ markedly from those of students with whom we are currently familiar.

Selective admissions, more imaginative programs to help students cope with anticipated stresses, more varied and appropriate instructional strategies, and more discerning examinations through the curriculum require urgent consideration.

Implications for Educational Programs

In order to meet the societal, professional and individual needs outlined above, consideration will need to embrace four components of the educational system: (1) the content of the program, (2) the organization of the curriculum, (3) the setting for learning and (4) the methods of instruction and assessment to be employed.

Content

Traditionally, content has been the only system component that has been seriously considered by most faculties, and it has continually suffered from metastatic accretions. But accretion is no longer a viable solution; revision of the content of the curriculum to incorporate the exploding base and to accommodate current and anticipated health needs requires integration, not merely addition, of the results of biomedical research. It also requires heavy curricular emphasis on methods of storing, retrieving and managing that information.

Organization of the Curriculum

How should that content be organized? Should it be structured along traditional disciplinary lines or in accord with a more functional principle, such as body systems or health problems?

To answer this question we must turn not to evidence from biomedical research, but to findings from studies of the psychology of learning, where basic research has taught us that people acquire more information, retain it longer, understand it better and are able to apply it more effectively if it has been learned (taught?) in a functional context.

These data strongly suggest that, however useful a disciplinary organization of knowledge may be for research and for the expansion of our knowledge base, some other principle or organizing information may be appropriate for its transmission to a new generation of practitioners. What that other principle is, is not entirely clear. To date the evidence suggests that students who learn in a problem-based, student-centered program are more enthusiastic, more motivated and perhaps even more self-directed. But we do not yet know whether they actually perform better than traditional students in delivering health care.

Setting

Where shall training take place? Shall it be primarily hospital-or community-based? Again, research in general education indicates that people perform most effectively when managing familiar problems that present in accustomed settings. This suggests the importance of in-

cluding a significant component of community-based instruction around common health problems, as opposed to placing primary reliance on experience in hospitals where instruction tends to be focused on more serious manifestations of illness.

While studies to date indicate that students trained in community settings feel better prepared to practice, evidence as to whether they actually are more competent than hospital trained students is not yet available.

Instructional and Assessment Methodologies

The usual formulations of questions about instructional strategy—lecture vs. student-centered over dramatize the issue. All modalities have a place and all should be employed. A challenging and authoritative lecture by an eloquent expert is demonstrably the most efficient way to transmit factual information and, perhaps to stimulate interest in research; small group tutorial instruction is demonstrably the best way for students to develop skill in problem-solving, independent learning and critical thinking. In short, "best" is determined by educational purpose. What is essential is that the methods be chosen on the basis of the objectives sought, and that each be implemented with consummate skill and judgment.

Analogous considerations apply with respect to choice of assessment techniques. The often misleading dichotomies between subjective vs. objective, multiple choice vs. essay, written vs. performance test only impede progress on the basic issue. As with instruction, that issue concerns the selection of methods appropriate to specific educational goals and to the type of achievements to be assessed, their optimal implementation and expert evaluation of the results. To assure the continued relevance of any reforms that are undertaken in response to the changing condition outlined above, it is essential that dynamic, reciprocal linkages be established between medical education and the health care delivery system.

Implications for Educational Research

In closing I shall comment briefly about the implications of changing conditions for research on medical education. As the impacts of changes in the conditions of medical education begin to manifest themselves on recruitment and training, as the rewards and satisfactions of practice are modified and as the characteristics of those attracted to medicine change, we who do research on medical education will necessarily face a revised set of priorities in developing their research agenda.

At the very least, we will probably need to discard existing research on admissions and career choice and start all over again to study the predictors of success and the correlates of career decisions. For, if the conditions of practice are modified and the sources of satisfactions are altered, the kinds of people who choose to enter medicine and the characteristics of those who succeed will also be affected.

Moreover, given the changing conditions of professional practice, I believe that it is urgent to reexamine the critical components of professional performance. For example, it may be that an understanding of problem-solving and decision-making will become less urgent simply because there will be less opportunity for physicians to exercise those skills in the future than there has been in the past. On the other hand, it is absolutely essential that we learn more about how values and attitudes of self-selected adults can be influenced, and that we better understand how norms once accepted can be reinforced in a society of potentially alienated workers. In short, it is quite possible that the requisite components of competence identified for the present generation of practitioners will need to be radically altered when applied to the next.

But whether or not a re-examination of the requisites of practice leads to a modified definition of competence, better means of developing that competence, of assessing it and of evaluat-

ing the programs purporting to enhance it, are urgently required.

Finally, I suspect that many, perhaps all, medical faculties will need to scrutinize more thoroughly the criteria by which they judge program effectiveness in light of a re-definition of institutional objectives, their implementation, their cost and public relations effectiveness, and the advantages of new organizational structure.

The challenges awaiting are becoming more clear, cogent and urgent.

REFERENCES

1. Wilson, M.P. and Smythe, C.M. "Medicine". In Handbook of Health Professions Education. C.H. McGuire, et. al., (Eds). San Francisco: Jossey Bass, 1983.

2. McGuire, C.H. "Evaluation of Students and Practitioner Competence". In Handbook of Health Professions Education. C.H. McGuire, et. al., (Eds).

3. Payer, Lynn. MEDICINE AND CULTURE: Varieties of Treatment in the United States, England, West Germany, and France. New York: Henry Holt & Company, 1988.

4. Wennberg, John & Gittelsohn, Alan. "Variations in Medical Care Among Small Areas". Scientific American, April, 1982, pp. 120-131.

5. Cotter, P.S. Analysis of Changing Patterns in Physicians Employment, 1983 to 1985. Chicago: American Medical Association, Center for Health Policy Research, 1986.

6. Larson, M.D. Proletarianization and Educated Labor. Theory and Society 9: 131-77, 1980.

7. Korcak, Milan. American Family Battle HMO's. Canadian Medical Association Journal. 133:483-484. September 1, 1985.

8. Friedson, Eliot. The Reorganization of the Medical Profession. Medical Care Review 42(1):11-35

* Feminization of the work force in other fields has typically been associated with lower income, prestige and status; whether that will also be true is still an open question.

Leighton E. Cluff, M.D.
President
Robert Wood Johnson Foundation

A STUDY OF MEDICAL SCHOOLS AND MEDICAL EDUCATION

In 1987, The Robert Wood Johnson Foundation commissioned a survey of approximately 50 selected senators, congressmen, governors, mayors, business leaders, and university presidents knowledgeable about health care problems, and a few senior health professionals. Each was interviewed and asked to respond to two questions: What major health problems are most likely to face the nation during the next decade, and to which should The Robert Wood Johnson Foundation give the greatest attention? Surprising to us, the sixth of more than thirty different problems mentioned was medical education. This initiated considerable effort by The Foundation to characterize the nature of the problems associated with medical education.

The information we have obtained may relate more to medical school rather than graduate medical education. But, I would be remiss if I did not emphasize the commitments already made by The Foundation to the graduate education of physicians. These commitments include: (1) The Robert Wood Johnson Clinical Scholars Program located in 7 academic medical centers, and, in collaboration with the United States Department of Veterans Affairs, supports 26 physicians, after completion of clinical training, for two years research training in the non-biological or social sciences relevant to health care, and in health services research. This program will continue until 1995, at least, and has to date, trained about 500 critically important leaders in health care systems, academic medical centers, commissioners of health and others, (2) The Health Policy Fellows Program, directed by The Institute of Medicine of The National Academy of Sciences provides one year experience and training in Washington for six mid-career health professionals annually working as staff to congressional committees, congressmen and senators. This program also will continue at least until 1995, (3) The Primary Care Residency Programs in internal medicine and pediatrics in 11 medical centers, serving as the forerunner of the federal program, (4) The General Pediatric Academic Development Program, now terminated, (5) The Family Practice Faculty Development Program, and (6) The Minority Medical Faculty Development Program, providing four years of stipend and research support to eight highly selected minority physicians annually preparing them for advanced careers in biomedical research. Eight additional fellows will be selected in 1991 for four years of support extending to 1995.

It is my perception that the physicians who have completed and are participating in these programs, are and will have a major impact on the future of health care and medical education.

The declining number of applicants to medical school; the increasing proportion of young physicians engaging in specialized training; the gender changes of medical students; concerns about access to medical care for certain segments of the population; and of dissatisfaction among medical practitioners, added to concerns about a projected increase in number of physicians, led the Robert Wood Johnson Foundation to support a study in 1987, conducted by the AMA Education and Research Foundation, of young physicians to examine their views of some of these events and concerns. The survey included 5,865 physicians, interviewed between April and November 1987. Young physicians were those under age 40 who had been in practice more than one, but less than 7 years after completing fellowship and residency training. Black and Hispanic physicians were oversampled, and statistical adjustments were made to compensate for any bias.

The percentage of young physicians who were Black or Hispanic was only one-third of their representation in the population (Figure 1).

Yet, one half of all patients seen by young black physicians are black compared to 16 percent of young white physicians. Similarly, Hispanic patients account for 28 percent of young Hispanic physicians' caseload, compared to 8 percent for white physicians (Figure 2).

Particularly important and interesting, other minority young physicians—many Oriental or Asian, represent a larger percentage of young physicians than their representation in the U.S. population.

More young physicians are in primary care practices than are men—irrespective of their racial or ethnic origin (Figure 3).

More than one-half of all young physicians are self-employed in solo or group practices and this increases from 44 percent in the second year of practice to 62 percent in the sixth year of practice. Unlike other racial and ethnic groups, the majority of Black physicians (57%) are employees of HMO's, public institutions and private hospitals.

In 1987—and increasing ever since—the level of indebtedness of young physicians is especially great at graduation, particularly among black students. Interestingly again, the level of indebtedness of other minorities is less than of any other groups (Figure 4). The percent of young physicians with heavy indebtedness is increasing. More of the recent graduates carried significant debt (Figure 5).

Forty percent of these young physicians were uncertain as to whether or not they would have gone to medical school if they were in college today.

These young physicians are pessimistic about the future of medical practice. Minority physicians are somewhat more pessimistic than whites. Although 15 percent of young physicians were women, only 4 percent of older physicians are women. Today over one-third of medical students are women.

This survey of young practicing physicians in 1987 is both reassuring and disquieting.

It was good to find many in primary care—especially women and blacks. The evidence indicates that those finishing their graduate

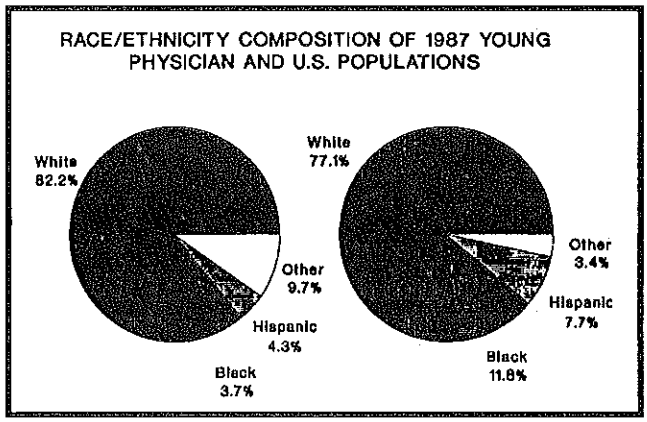


Figure 1

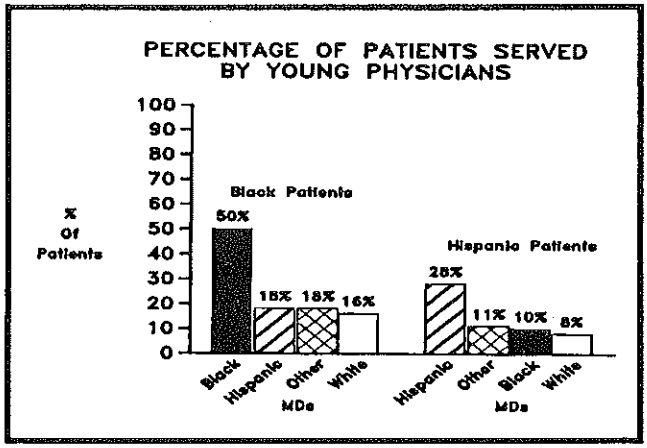


Figure 2

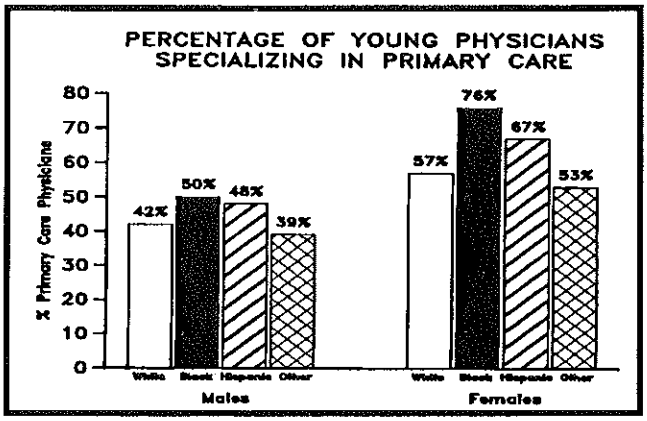


Figure 3

medical education have difficulty early on in building their medical practices, and become employed physicians. But within a few years they become self-employed. There was no evidence of stressed economic conditions in earning

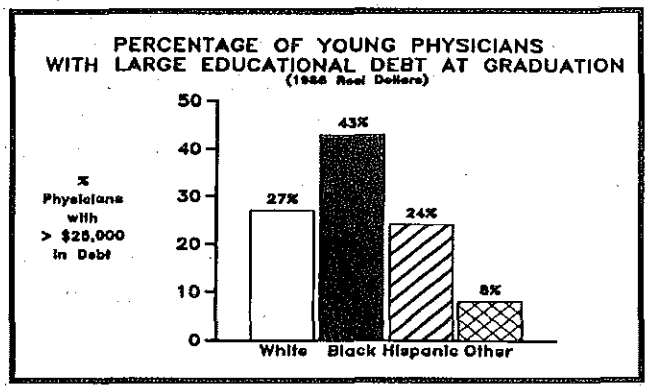


Figure 4

an income, but the growing level of indebtedness may be influencing career choices. Their level of indebtedness may negate proposed responses in physician payment reform as graduates choose their career paths.

Although forty percent of physicians questioned whether or not they should have gone to medical school, this is only slightly smaller than for mid-career and senior physicians. But, this percentage among young physicians should not be taken lightly.

In 1989, The Robert Wood Johnson Foundation commissioned Louis Harris and Associates to conduct a survey of the 127 U.S. medical school faculty, department heads and Deans, to determine their views on: (1) the perceived need for changes in medical student education; (2) the nature of desired changes; and (3) the readiness of their institutions to undertake such changes. One thousand-three hundred and sixty-nine persons from U.S. medical schools were interviewed, and this included 123 of the 127 Deans.

With the exception of basic science faculty, the majority of medical educators responded that fundamental changes were required in medical education. The desire for change in the overall system of medical education nationally, also is reflected in the respondents views of their own institutions (Figure 6).

Few of the respondents indicated that their own students were being well prepared and their educational programs were considered not fully up-to-date (Figures 7 and 8).

More than 95 percent of educators would support three reforms: (1) new systems to reward teaching excellence; (2) methods to evaluate student's problem-solving skills; (3) and better integration of the basic science and clinical phases of training. A majority of educators strongly support these reforms.

Other reforms are supported or strongly supported by the majority of respondents (79% to 86%). These are: (1) decrease the number of large lectures; (2) move more clinical education to ambulatory and other community settings; (3) place greater emphasis on developing the general medical education of students; (4) and rely more on graduate medical education for required basic science as well as clinical training in the medical and surgical subspecialties.

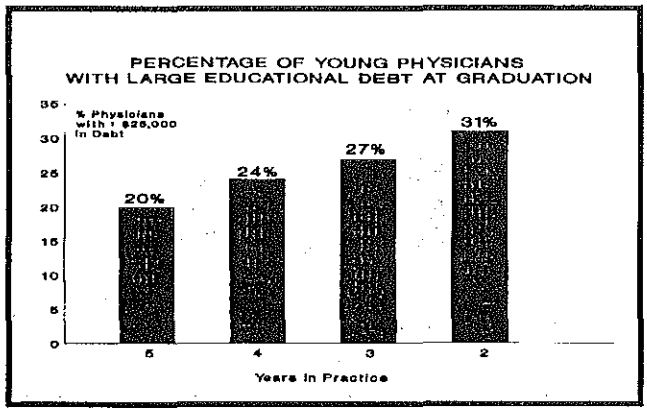


Figure 5

Interestingly the Curriculum Committee and Department Chairpersons are seen as having the most control over medical education. In many ways, the Dean is seen as low man on the totem pole. The essence of this observation is that in most medical schools no one seems to have the responsibility or authority in working with faculty to define the student's educational

program (Figure 9).

The idea of vesting someone or a designated group of faculty with the authority and budgetary control to develop and administer the educational program is supported by a majority of respondents with the exception of Departmental Chairpersons. In contrast, some or all groups would work against such a scheme (Figure 10).

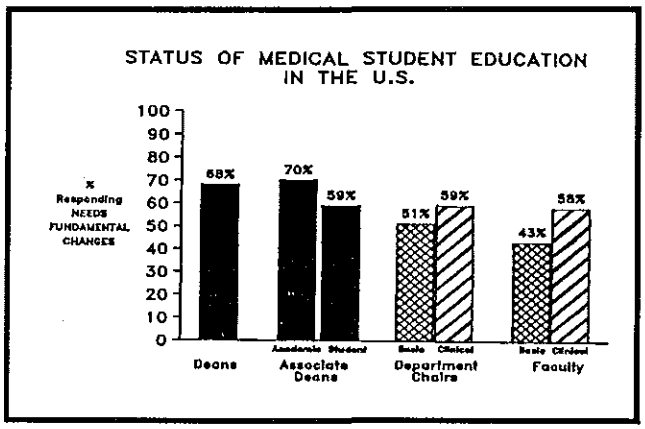


Figure 6

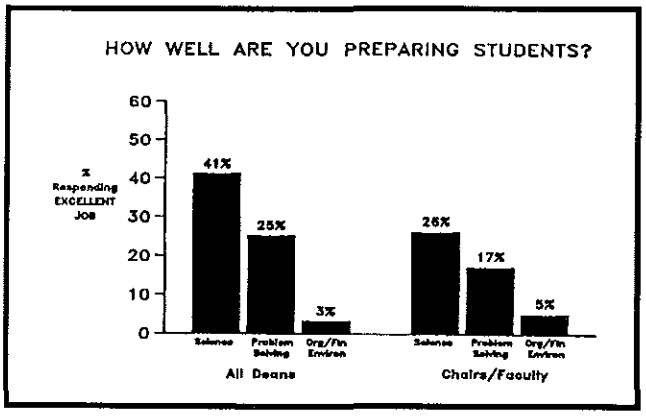


Figure 7

A broad base of support within a medical school is essential to restructure the educational program. The Dean, medicine and surgery chairs, other department chairs, the faculty and the curriculum committees were considered essential by at least half of the educators surveyed.

Only among administration does a majority of respondents feel that the most important performance criterion by which faculty are evaluated is the quality of medical student education. Fewer than one-fourth of department chairs and only one-fifth of faculty feel that quality of education is more important than research and patient care.

The prospect of a restructured physician payment system that weighs the time and cognitive content of medical practice is viewed as a potential positive influence on medical education by 82 percent of medical department chairs and faculty compared to only 32 percent of chairs and faculty in surgical departments.

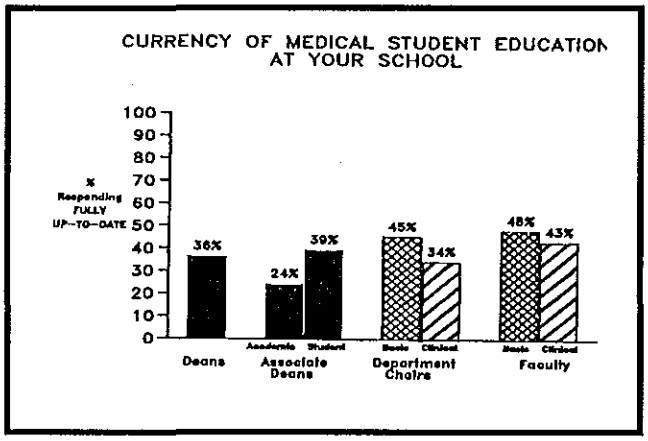


Figure 8

The findings from this 1989 survey demonstrate a greater perceived need for fundamental changes in medical education than was demonstrated in a similar poll in 1983 conducted for the AAMC. Furthermore, a majority of medical educators feel that medical education at their own institutions has not kept pace with changes in the way

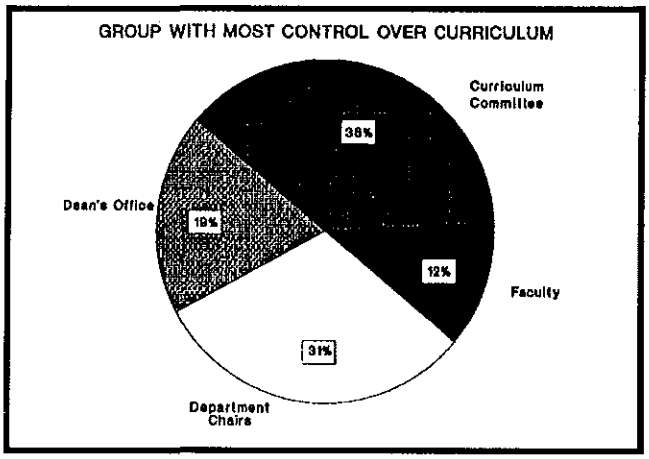


Figure 9

medicine is currently practiced.

Of great importance, clearly, no one or one group presently is in the position to implement fundamental changes in medical education, and basic science education has seemed to have become less interactive with the clinical training of students in preparing them for subsequent

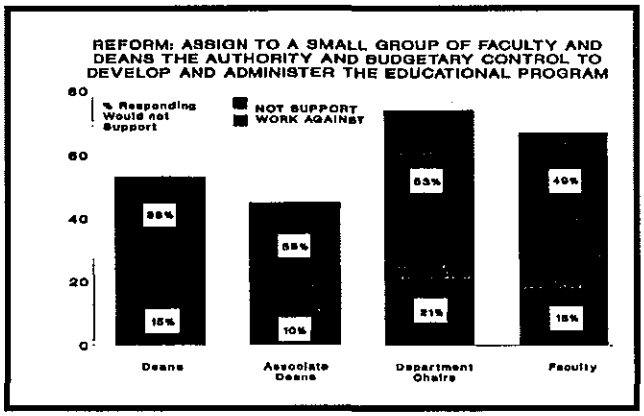


Figure 10

differentiation in their graduate residency programs.

There is a clear picture of restlessness among leaders of American medical education, suggesting that the time may be ripe for substantial reform.

In April 1989, The Foundation supported a meeting at Thomas Jefferson University to examine the connection or lack of connection between premedical collegiate education and medical school education. Ten university or college presidents and a corresponding number of medical school deans discussed and examined what had appeared to be a divisiveness and isolation in these educational programs, each addressing the same career goals of their students. Obstacles encountered in developing cross-system teaching were identified. The following are summary statements resulting from this meeting: (1) physicians must learn to widen their scope of interest, share power, and understand culture and its heterogeneity, in order to provide medical care; (2) it is the responsibility of physicians to care for populations as well as individual patients; (3) there is little understanding by medical educators and schools, and premedical educators and liberal arts colleges as to what each is all about, or what each is teaching; (4) premedical advisors are a weak link in the system, and admissions committees often select students to achieve objectives different than those of the medical school; (5) we need to define the relevancy of science, both basic and applied, to medical practice; (6) leadership for change must come from the top.

Dr. Richard Reynolds and I met in 1989 with 50 medical students representing an equal number of medical schools. Our purpose was to have an informal discussion with them about medical education. Most were third and fourth year students. In addition, during the past 12 months I have visited with students in at least 10 medical schools.

First, I must say that today's students are the cream of America's young people; concerned about the nation's health care and its problems to a degree not always appreciated. They are altruistic but practical, and we should be proud of them and ensure that we don't destroy or disillusion them and their deeply felt interest in medicine.

Their concerns about medical education are little different than those we saw among most educators. They are concerned about the lack of integration or understanding between collegiate and medical education. They often find duplication in what they learn in the biological sciences in college and what they are taught in medical school. Many are concerned about their growing indebtedness and the impact this has on the course they pursue in their graduate training. They are concerned that teaching is not rewarded by the school. They want clinical experiences outside the university hospital and in the community. They, too, believe that chairpersons determine their educational program, and that no one seems to be in overall charge of medical education. They are concerned, in some schools, that the National Board of Medical

Examiners, particularly Part I, dictates what they are taught or what they know they must prepare for.

The Robert Wood Johnson Foundation's program, Preparing Physicians for the 21st Century, was developed in response to the increasing perception we gained from the surveys and observations we made in 1987-1989 that fundamental changes are needed in the nation's medical education system. Contrasted with circumstances 80 years, we were unable to identify medical school models which addressed each of the significant changes required. It is The Foundation's intention to assist in developing these models.

As is well known, the program for which initial grants will be awarded this summer has three components. These relate to: (1) governance over the educational program; (2) examine, define, and structure the basic science education programs so that they prepare students appropriately to begin clinical training, as a basis for subsequent differentiation in medical practice; and (3) develop settings for clinical experiences and training in the community--including nursing homes, group practices, hospitals and ambulatory clinics.

As a parallel but coordinated effort we established a Foundation Commission on Medical Education: The Sciences of Medical Practice, to develop guidelines and principles which schools will use in developing their science curriculum.

Finally, let me conclude by stating strongly, that medical students and those in graduate training are among the best of the nation's young people. They do what they do because they believe being a physician is honorable, and that medicine is a noble profession.

We as educators owe it to these young people who will be our future physicians, to see that their education and training is consistent with their objectives to become good doctors.

Louis J. Kettel, M.D.
Vice President for Academic Affairs
Association of American Medical Colleges
Washington, DC

"AAMC/CULPEPER STUDY: ASSESSING CHANGE IN MEDICAL EDUCATION--THE ROAD TO IMPLEMENTATION (ACME-TRI)"

Curriculum change is occurring. Perhaps not fast enough, but, as Christine McGuire noted in her presentation, "Why Medical Education has not Changed", there has been change and more change is occurring. It may not be all that is desired, but I will show you evidence that change is taking place and that there is considerable tension for change as Leighton E. Cluff, M.D., described from the Louis Harris survey in his presentation, "A Study of Medical Schools and Medical Education."

As these presenters noted, there are also many suggestions about the direction change has taken and about the direction they view change should take. In this presentation, I will comment on these suggestions, the observations the "Assessing Change in Medical Education--The Road to Implementation" (ACME-TRI) is making, and the role of the Association of American Medical Colleges (AAMC) has in implementing change.

Why is change in the medical education system desirable? Some insight is obtained from the responses of non-matriculating students who tell us why they changed their career plans. On two occasions in recent years, the AAMC has surveyed those students who are qualified but chose not to pursue a career in medicine despite completing the Medical College Admissions Test (MCAT)[1]. These are not applicants who were rejected, rather people who changed their minds about medicine as a career.

Table 1 lists the response rates for some of the questions asked of the non-matriculating students. One of the reasons for eschewing a medical career is the educational process is too long and expensive. This is a very practical reason to change the medical education program leading to the degree. The cost is more frequently mentioned than the length per se, but length adds to cost. High cost encourages a large debt burden on graduation. The schools with the highest tuition are concerned about cost...even if it is only because they must compete with each other for the best applicants. If they cannot lower their cost they must develop a more attractive educational program.

The longer the program of education, the more the delay in gratification. The actual cost, the debt and the length of time before one begins to practice a career of choice must be considered when comparing one form of "caring" or "science" profession with another. In the Robert Wood Johnson/AAMC study of young physicians described earlier today by Dr. Cluff, minority physicians chose primary care more frequently than majority young physicians. Is

TABLE 1

NON-MATRICULATING MCAT TAKERS
REASONS FOR NON-MATRICULATION

	% of Cases	
	1986	1988
Financial Concerns	74	61
Physicians Discouraging	22	48
Other Science Career Interest	38	35
Curriculum Too Intense/Long	19	4
Predicted Physician Surplus	12	20
Study of Medicine Not Stimulating	12	21
Other Career Helping People	10	23
Too Much Competition in Medical School	6	12

this because the length of training is shorter, leading to less debt and a shorter time before beginning practice?

There are many factors that contribute to the length, intensity and cost of medical education. The lecture form of education is one. While the lecture form of teaching is under challenged, it is also defended as the most rapid and efficient way to deliver information. Certainly the lecture takes less time than the slow more active form of learning which occurs in small group tutorial sessions. Learning theory tells us, however, that we learn best when the process is active. The listening mode, i.e., the lecture, is passive. Hence learning is at a low efficiency while teacher time and learning might be at a high efficiency. We often hear faculty say they learn more than the students. This is not surprising since preparation and delivery are most of the active work.

Experience also tells us that we learn best when the learning is problem specific, e.g., when a pipe is leaking in your home you learn a lot about plumbing; most of the learning you wouldn't consider under any other circumstance. This is certainly one justification for the active learning of the problem-based format.

The content of the educational system is challenged as much on the knowledge that the environment of the practice of medicine is changing as on data from medical education or other research. For example, there is the argument that 80 percent of medical contacts are made by patients with problems which occur in the outpatient setting, yet we educate predominantly in the inpatient services. The reasons for this are more matters of practicality than educational strategy. When one looks at the problems presented by patients in the ambulatory setting one sees health maintenance, disease prevention and wellness; chronic disease care; aging phenomena; nutrition, and economic/social issues all looming high.

Thus, regardless of other factors, there is serious question whether the teaching sites and the diseases present in those sites are appropriate for medical education. In-hospital patients are more seriously ill with less common problems, e.g., AIDS, cancer, and problems of aging at one extreme while neonatology, trauma, and effects of substance abuse are at the other. Ambulatory settings are the sites for the more common problems, e.g., cataracts, hernias, hypertension, obesity, heart disease, chronic lung disease, and benign cancers. These problems were the "bread and butter" of the inpatient services of the past.

Because of these considerations, the point being made by many educators is that we should choose the site of education based upon what the learning objectives are, not by the convenience of the site or the particular characteristics of the patients or their payment system. Simply because the patient is in the out-patient setting doesn't necessarily mean that's where we ought to teach. It may be a terrible choice of site...indeed, many ambulatory settings are terrible teaching sites. They may be congested with few if any places to discuss the patient problems out of hearing of the patient or at a pace practical for learning. The pace may be so fast that little time for learning through observation can occur. The student experience may be little more than that of "parade watching" and the system seen may be so bureaucratic that the students leave having learned little except that the form of patient care, e.g., primary care is unattractive and out of the student's control. Do we wish the students to study the payment system? Do we want them to see specific diseases? Do we wish them to be exposed to the social problems of medicine? Do we want them to have a specific level of responsibility? Do we wish them to learn about a specific form of record keeping? These should influence the site of learning selection knowingly not as an afterthought to justify use of a particular site.

Physicians must know the most efficient ways to keep well educated. The world of medicine and health is dynamic and changing very rapidly and continually. Obsolescence and ignorance

occur among practitioners. It is not known quantitatively how large or frequent are the gaps in current knowledge, but even so recertification and relicensing are being proposed as strategies to assure the public of the continued presence of high standards in practice.

I recently spoke to a curriculum planning workshop at a Northeast medical school. I was to discuss dealing with the "biomedical knowledge explosion." Rather than lecture we had a "problem solving" learning session in which I was simply the guide. Without much difficulty the group of 30-40 faculty concluded that including self-assessment and self-directed learning skills in the educational objectives was the solution for that school's educational program. They intend to figure out a strategy to test for the presence of such skills among their students by graduation.

Social consciousness and economic forces are putting pressure on schools to change education. The earlier speakers today highlighted this need. We are reminded of the continued rise in the percent of the Gross National Product which is attributed to health care and the apparent lack of care given to the un- and underinsured, the chronically ill, e.g., those in nursing homes, and especially the elderly. The American Association of Retired Persons and others condemn the health professions for lack of attention to the high cost to the elderly, and seemingly low attention to wellness and prevention.

I am not sure how clear society is about what it expects. It is certainly variable in what it expects of medical schools. Hence, unless the medical school reads the signs of its local environment correctly it may make some wrong decisions. In states with multiple medical schools one school might focus on research, another on rural primary health care, and another on inner city health care delivery, but the legislature might well expect a different agenda from each than the one they internally choose...and the drama might well play out in the budget process to a school's disadvantage.

In selecting students for a given school program, e.g., for their interest in rural health care, the student may well be disappointed if the reimbursement system is not sufficient or the medical liability insurance is too costly to allow practice in the most needy community of the state. Until society is a participant either on its own or with the leadership of the school, it is unlikely the school will be able to assist in meeting the local community's needs. The recent Kellogg Foundation initiative that offers to fund innovative ventures by the academic medical center into the community may be just the motivation needed to bring communities and medical schools together to meet the challenge and provide a socially acceptable linkage which will provide the solution.

If medical students are assigned to ambulatory settings to learn, but are exposed to the stress of budget cuts, financial shortfalls, and non-supportive bureaucracies, it is unlikely anything the school can do in the educational program will cause the graduate to choose such a career or practice site.

Recommendations to "help medical schools respond" have been in profusion. Two of the best known are the AMA Future Directions for Medical Education now ten years old and the AAMC Report from the Panel on the General Preparatory Education of Physicians (GPEP) now five years old. But there are others.

Table 2 lists these and recommendations of the several commissions and task forces over the past 50 years. And more studies are added regularly such as the Proceedings of the Macy Conference of last summer published recently by The New York Academy of Medicine. These reports generally have made similar recommendations to those which were made by Rappleye some 50 years ago.

In response to these recommendations the AAMC has tried to assist schools in their efforts to make educational program change through various workshops and when asked specific

consultations. Some examples of the strategies are as follows:

A. A consensus conference on Ambulatory care,
B. A study of current issues in teaching in the Ambulatory setting,
C. Offers regularly evaluation development workshops,
D. Offers regularly problem-based learning workshops,
E. An annual Informatics Update Conference,
F. And the Annual Research in Medical Education (RIME) conference.

What changes have occurred? You are aware from the literature and even from local newspapers of a number of schools that have made dramatic changes in their education programs. There are the early changes to the problem-based approach of the medical schools at McMaster University, University of New Mexico, Bowman Gray, Tufts University, Southern Illinois University, and Rush University. To these have been added the recent well publicized similar programs at Harvard University, University of Hawaii and University of Sherbrooke[2]. These schools have at least one track of students in the basic science years, but several are now using the problem-based approach for all students in all four years. Many other schools are using the problem-based format in selected courses.

Additionally, there are schools that no longer have specific entrance course requirements, such as the school of medicine at the University of Pennsylvania. Others have eschewed the Medical College Admission Test (MCAT) as an entrance requirement such as University of Rochester, Mayo, and Johns Hopkins University.

TABLE 2
50 YEARS OF RECOMMENDATIONS FOR MEDICAL EDUCATION

The following statements represent a consolidation of 50 YEARS of recommendations about medical student education programs made by varied task forces, panels and conference participants:

- Program and course objectives and commencement competencies should be clearly specified;
- The following objectives should be part of all medical education programs: 1) skills and values; 2) self-directed learning; and 3) information management;
- Student progress toward all medical education program objectives should be evaluated;
- Evaluation of student non-cognitive abilities should be strengthened particularly in the areas of clinical training and self-directed learning.
- MCAT and NBME scores should be reported as pass/fail to facilitate the proper use of standardized test scores;
- The medical education program should emphasize the student's development of clinical reasoning skills;
- Instructors of clinical clerkships should have adequate teaching skills;
- The educational program leading to the M.D. degree should be subject to systematic local oversight;
- The importance of teaching in the medical education program should be recognized;
- An academic unit should be designated to provide leadership for the instruction of information science and computer management;
- Provide assistance to the faculty to develop their ability to teach across the curriculum.

Sources:

Rappleye, W.C. (Director). Medical Education: Final Report of the Commission on Medical Education. New York: Association of American Colleges Commission on Medical Education, 1932.

Future Directors for Medical Education: A Report of the Council on Medical Education, American Medical Association, Chicago, 1982.

Friedman, C.P. and Purcell, E.F., (eds.). The New Biology and Medical Education: Merging the Biological, Information, and Cognitive Sciences--Report of a Conference Sponsored Jointly by the University of North Carolina and Josiah Macy, Jr. Foundation. Josiah Macy, Jr. Foundation, New York, 1983.

Muller, S. (Chairman). Physicians for the Twenty-First Century/Report of the Project Panel on the General Professional Education of the Physician and College Preparation for Medicine. Journal of Medical Education, 59:Part 2, November, 1984.

Gastel, B. and Rogers, D.E., (eds.). Clinical Education and the Doctor of Tomorrow: Proceedings of the Josiah Macy, Jr. Foundation National Seminar on Medical Education Adaption Clinical Medical Education to the Needs of Today and Tomorrow. The New York Academy of Medicine, New York, 1989.

A large number of schools are now using objective structured clinical examinations (OSCE) usually with patient instructors/simulators. The OSCE may be used to monitor learning accomplished or to determine academic progression examinations in selected courses or as a senior year competency examination such as that developed at Southern Illinois University.The AAMC Curriculum Directory may be used to obtain the frequency of change. From the 1989 Directory, M.Brownell Anderson, AAMC Director of Educational Programs, has tabulated the following data.

Figure 1 displays the year one total and type of contact hours. The Directory records the hours as lecture, conference, laboratory and other experiences. The other category includes small groups and tutorials. The total contact hours in the first year has decreased from approximately 930 to 850 hours since 1983. That is less than 10 percent in six years. While it is true that lecture hours have declined slightly from 465 to 441 hours, the major decline has been in laboratory time. Concomitantly there has been an increase in the amount of time assigned to conference.

The same pattern is true for the second year (see Figure 2). Again, a small decrease in total hours and a small decrease in lecture hours. The trends are there, but certainly not to the extent the recommendations would have hoped.

Table 3 provides some insights by school. Eleven schools have not changed lecture hours in the six years and 31 have actually increased the number of lecture hours over the period. Only 79 schools have decreased the total contact hours and only 42 schools have decreased more than 70 hours in the second and first years combined.

The analysis of contact hours does not reveal the magnitude of innovation in the changes. Independent learning is one such strategy. In the 1989 Directory, 104 schools said that they had either initiated or increased their independent learning activities for students (see Figure 3). The use of computer assisted instruction continues to increase. Surely the rate of change is a function of resource availability. Obtaining computers and recruiting faculty and staff takes real time and so diffusion of the technology into education is expected to be gradual, but 89 percent of the schools now claim they do something with computers in the educational program (see Figure 4).

Figure 5 shows that many schools are using some form of small group discussion. The integration of basic science with clinical education had been attempted by 83 schools in 1988-89 (see Figure 6). How this is done is not reported

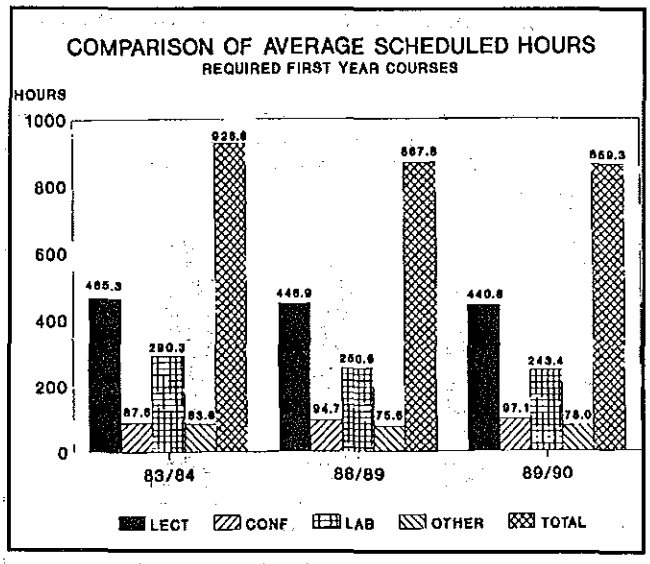


Figure 1

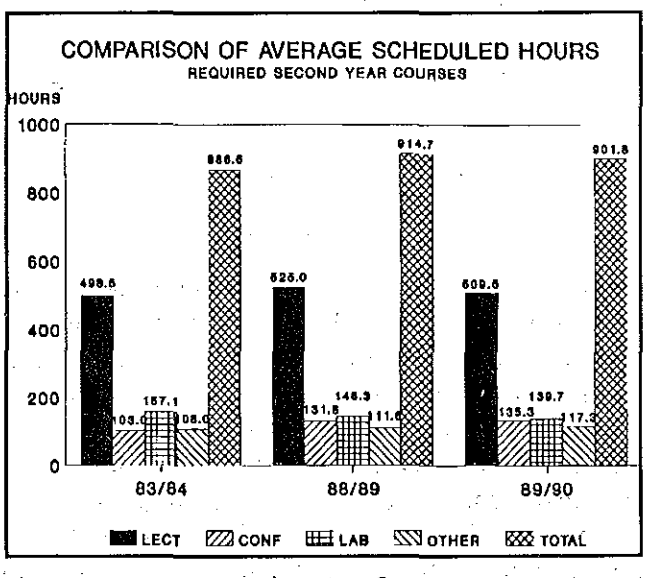


Figure 2

in the survey that leads to the data in the Curriculum Directory. It simply may be represented by a combined clinical and basic sciences "grand rounds" to which students are invited or it may be truly integrated organ systems education.

The National Board of Medical Examiners (NBME) tests are being used more and more as academic progression measures. Part I use has increased from 46 to 52 percent of the schools now demanding passage to enter the third year. Many schools also require Part II of the NBME test prior to graduation.

Each year the AAMC distributes a survey to schools for graduating seniors to complete. Some of the trends in student views of there education are shown in Table 4. About 70 percent of the students complete the survey instrument annually. For basic science little has changed between the 1988 and the 1990 questionnaire responses. Five to 7 percent of the students report basic science education is inadequate, while 26 percent say it is excessive. Despite the report of an increased use of independent learning claimed by the schools, 25 percent report it is inadequate. On some specific topics, the majority of students report preventive care, medical care costs, geriatrics and ambulatory care are inadequately taught. Computer use, in spite of all the computer assisted instruction reported, is also deemed inadequate by many students, although this form of innovation is improving.

TABLE 3

CONTACT HOURS, REQUIRED PRECLINICAL COURSES

1983 VS 1989

	Number SCHOOLS*	%
NO CHANGE IN TOTAL SCHEDULED HOURS	11	9
INCREASE IN TOTAL SCHEDULED HOURS	31	26
DECREASE IN TOTAL SCHEDULED HOURS	79	65
DECREASE OF 70 OR MORE HOURS	42	35

* N = 121 (SCHOOLS THAT CAN COUNT HOURS)

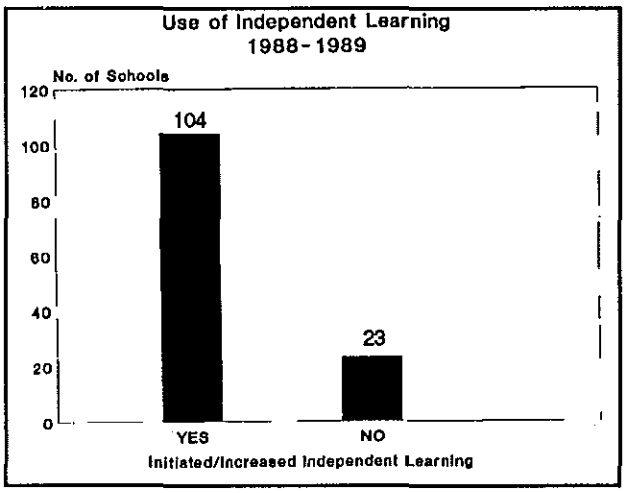


Figure 3

In spite of the change reported by schools, the fact is that the students do not consider the results adequate.

Against this background the AAMC has begun a study funded by the Charles E. Culpeper Foundation. The impetus for this study was based upon the desire of the AAMC to evaluate the impact on medical education of the GPEP

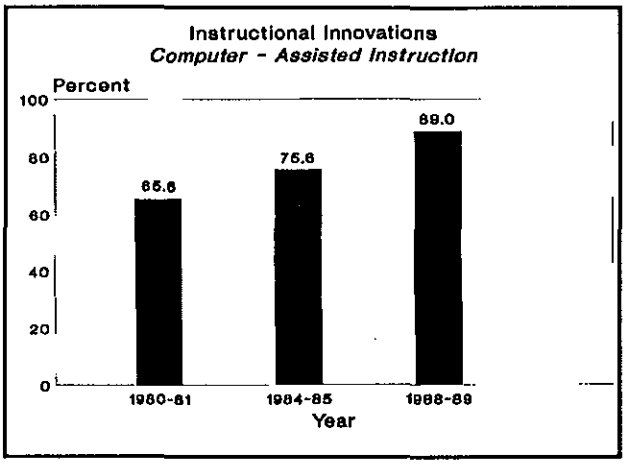


Figure 4

and other recommendations. The perception was that little change has occurred. If that was true, the question then became, "What can the Association do to cause change?"; and if the AAMC were to do something, it had best be in an area liable to produce change and be in an area

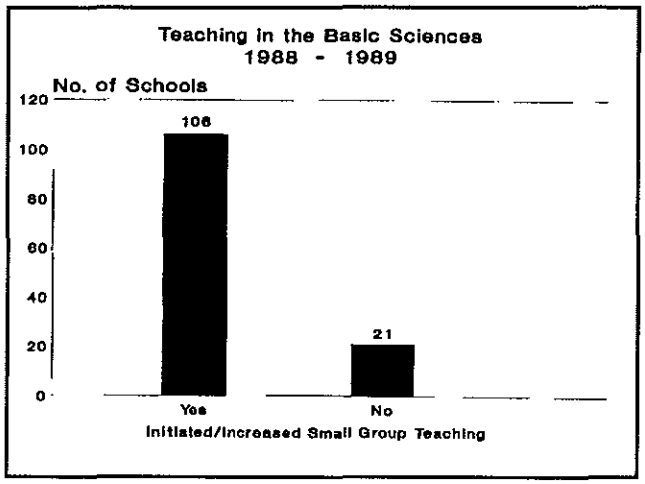


Figure 5

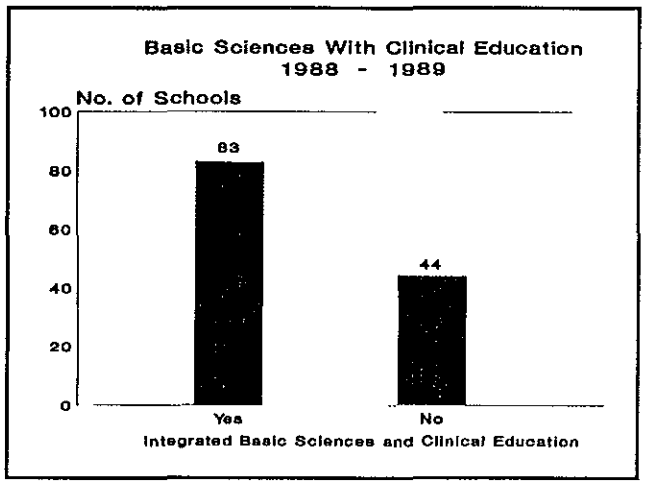


Figure 6

the medical education community deemed necessary. The study is designed to look at the changes which are occurring, have occurred or are being planned to occur. From this information we are trying to find what the constituency needs to help implement other changes. There is no intent to write more recommendations. There are sufficient recommendations. Rather, we wanted to find out what can and what cannot be done and to try to put some implementation strategies into place. Virtually none of the recommendations made to date come with instructions on implementation or how to obtain resources to implement the changes suggested. The title of the project represents well the summary of the proposal, i.e., **Assessing Change in Medical Education: The Road to Implementation (ACME-TRI).**

TABLE 4

MEDICAL SCHOOL EXPERIENCE AND CURRICULUM

COURSE OFFERING	INADEQUATE %RESPONDENTS '90	INADEQUATE %RESPONDENTS '88	EXCESSIVE %RESPONDENTS '90	EXCESSIVE %RESPONDENTS '88
Basic Science Information	7	5	26	26
Ambulatory Care	38	37	2	2
Geriatrics	29	32	4	3
Preventive Care	55	55	2	2
Medical Care Cost	67	64	3	1
Independent Learning/ Self Evaluation Skills	26	25	3	3
Study Skills	19	18	2	1
Computer Use	51	62	1	1

The changes we sought are mainly those listed in Table 2. We first looked to the Curriculum Directory as displayed above, reviewed the Liaison Committee on Medical Education data base and the medical education literature seeking evidence for the magnitude of educational change. While there are some useful findings in these sources, the specifics of successful implementation and the description of difficulties in implementation required the individual school descriptions. A survey instrument to obtain this information is now in the field. Over fifty schools have already responded. The spectrum of activity ranges from complete "revolutionary" change to no activity whatsoever.

Some observations are already becoming clear. They can best be described by considering the forces that seem apparent when the schools report their willingness to change and the success or failure to change that results. These factors can be viewed as forces which either push or resist change or support the status quo. Many of these factors or forces can be described in terms of ownership in the educational program. It was quite apparent when the GPEP report was made, that deans of medical schools did not consider the recommendations as being their property. This was true despite the fact the panel tried to engage them in various ways. Thus few took the leadership for change as an owner might.

Second, the high cost of change has to be recognized. All change is expensive. It may be expensive in time, in emotion, in the turmoil it produces, and in funds for space, equipment and faculty. These costs may be for planning, implementation and for continuing the program. Computers are expensive. Ambulatory care facilities are expensive. Small group conference rooms are expensive. All of these take resources in an academic medical center often struggling against a variety of other demands for resources.

Third, academia is a conservative system...by choice, by philosophy, by rewards and in protection of its limited resources. It resists revolution. It is also parochial and insular. Faculty defend and cherish their autonomy. Schools may even resist "gifts" of funds if the "strings" are too tight, e.g., the capitation awards to medical schools in the 60's and 70's were rebuked when the curriculum and the output demands became great.

Fourth, academia is scientific in its approach. Change is resisted that cannot be defended on validity grounds. Crisp endpoints are not available in education...hence the status quo is easily protected. Accreditation and licensure demand a successful graduate...educational program change has a risk that the graduate will not succeed in the existing licensing evaluation system.

Fifth, the management of education and its leadership is important. In the presence of instability in the management, e.g., a change in the deanship, delays overall educational program change. For many years medical school deanships were changing at about 15 percent per year. In the last several years the trend is to more frequent change, approaching 20 percent per year.

Sixth, accreditation rules change, but the accreditation demands for stability remain, at least for resources. One of the changes being proposed by the LCME is more central control of the education program. How schools will respond to this new requirement is not known.

Seventh, financial resources for change can be critical. The LCME looks closely at financial viability. Oral Roberts University was under considerable pressure from the accrediting process prior to deciding it did not have the financial resources to mount or maintain its educational program and as a result closed. The early analysis of the ACME-TRI survey suggests that funds are indeed critical to change and to maintenance of the change in education.

Eighth, it is important to recognize that medical schools also have missions in addition to medical education. Mercer University is specifically charged to produce primary care focused physicians. I have been told the University of New Mexico primary care track was created following the insistence of the legislature to develop primary care physicians. The medical schools of Texas have been required by statute to include a required clinical third year clerkship in family medicine. Some schools are responsible for the care of the state's indigent, e.g., the University of Texas Medical Branch at Galveston. It is reasonable therefore to expect that medical education program change will or will not occur depending upon resources and the charge to the school in relation to such mandates.

To give a sense of the importance of these observations, a few examples from the early survey reviews may help. As to the leadership

issue, one survey response contains the comments that they have not had a permanent dean for three years and education change per force has been a low priority. At the other extreme several schools thanked the AAMC for the survey instrument. The school was able to use it as a study document to call attention to the potential areas of change in medical education.

Similarly, it is important to note the impact of the Robert Wood Johnson process in soliciting proposals for plans to change the education program. Some 69 schools submitted a proposal for change including more central management of the educational program. While not all of these will be funded even for planning grants, the process has stimulated consideration of the institution's educational program. Similarly, the Kellogg Foundation grants program is addressing ways in which academic medical centers could transport the tertiary care driven medical center educational and scientific expertise into the community jointly to improve education and to solve health care delivery problems.

In addition to the grant submission process itself, the funds from the foundations are also critical. Foundation funds were critical to developing and implementing the Harvard New Pathways program. A grant from the Kellogg Foundation sustained the University of New Mexico primary care track. The Oregon Health Sciences University has progressed in its curriculum revision through a grant from the Charles E. Culpeper Foundation.

The leadership for educational change appears critical. Harry N. Beaty, M.D., Dean at Northwestern University and Chair of the ACME-TRI Advisory Group reports his personal involvement in leading the development of institutional educational goals and objectives. The window of opportunity that is present at the time of assuming leadership and setting goals and priorities appears useful. Christian L. Gulbrandsen, M.D., Dean at the University of Hawaii, reports leadership in instituting a new problem-based curriculum very soon after assuming the deanship. Similarly, Michel A. Bureau, M.D., Dean at University of Sherbrooke, as his major objective for the deanship set in motion full curriculum change and a program of faculty development which resulted in the implementation of a problem-based curriculum phased in over four years.

These experiences are being described in the ACME-TRI survey instrument. Our analysis seeks to dissect from the findings the characteristics of successful change and implementation and the forces which impede such change. From these data we will assist in the implementation efforts of schools desiring to change.

The findings of the ACME-TRI study are being shared with foundations in an effort to guide their support in the change mechanism. I would hope we can solicit governmental assistance as well. At least to the extent that impediments to educational program change are discovered in the reimbursement system Federal attention should be captured. Such an area would be the reimbursement of ambulatory care. Faculty practice plans must be able to contribute to the educational system without fear of the Health Care Financing Administration altering the faculty's fee schedules. The present Federal funding of graduate medical education must recognize the role and cost of ambulatory education.

In the role that education plays in attracting physicians to primary care and practice sites in under-served areas, development of education programs supportive of these directions is critical. The National Health Service Corps, Area Health Education Centers, and various forms of loan forgiveness and favorable reimbursement systems need support. Education programs should be encouraged to locate experiences in innovative settings through such programs. When these types of incentives are present it appears educational program change can and does occur.

References

1. Colquit, Wendy L., and Killian, Charles D. Students Who Consider Medicine But Decide Against It. Academic Medicine 66: 273-278,1991.

2. 1989-90 AAMC Curriculum Directory, 18th Edition. Association of American Medical Colleges, Washingtom, D.C. 1989.

August G. Swanson, M.D.
Vice President for Graduate Medical Education and International Programs
Association of American Medical Colleges

MEDICAL STUDENTS' SPECIALTY CHOICES

The distribution of U.S. medical school graduates choices of medical and surgical specialties is remarkably constant from year to year. Only 11% to 13% have made a firm decision about the specialty they will practice at the time of admission to medical school, and most admission committees do not use a candidates specialty aspirations as an admission criterion. This means that 87% to 89% of matriculants expect and are prepared to make a decision about their specialty choice during medical school. Graduation questionnaire data show that all but 8% make that decision. Although there are slow trends, year to year changes in the percentage of students planning certification in one specialty or another are generally small. An inspection of Table 1 shows this. Although some specialties are increasing and some decreasing, each annual cohort tends to mirror the spectrum of choices of its predecessors. For reasons that I cannot define, year after year around 5% of each class plan to be psychiatrists 2.6% otolaryngologists, 2.4% pathologists, 0.7% thoracic surgeons, etc. Remember, these graduates were not selected to enter medical school because of the choices they had made or were expected to make. There appear to be factors in the environment and process of medical educa-

TABLE 1
CERTIFICATION PLANS OF SENIOR MEDICAL STUDENTS

Certification Plans	1986	1987	1988	1989
Number of respondents	7,675	7,983	7,555	8,384
Anesthesiology	5.9%	6.5%	6.5%	6.5%
Dermatology	1.8	1.7	2.1	2.7
Emergency Medicine	3.5	3.7	3.9	4.1
*Family Practice	17.0	18.3	13.6	13.7
*General Internal Medicine	8.3	6.8	7.3	5.3
Internal Medicine Subspecs.	5.0	5.3	6.5	8.6
Neurology	2.4	1.8	2.1	2.1
Obstetrics/Gynecology	5.9	5.2	5.8	5.1
Obstetrics Subspecs.	1.1	1.5	1.4	1.8
Ophthalmology	4.2	4.1	4.0	3.9
Pathology	2.1	2.4	2.1	2.4
*General Pediatrics	5.4	5.2	4.9	4.6
Pediatric Subspecs.	1.3	1.5	1.7	1.8
Physical Medicine & Rehab.	1.6	1.8	2.1	2.1
General Preventive Medicine	0.2	0.2	0.1	0.1
Psychiatry	5.1	5.1	5.3	4.6
Diagnostic Radiology	5.3	5.6	6.5	6.3
Therapeutic Radiology	0.7	1.1	0.9	0.9
General Surgery	6.2	5.9	5.4	5.0
Neurological Surgery	0.9	1.2	1.4	1.1
Orthopedic Surgery	6.7	5.8	6.2	5.9
Otolaryngology	2.6	2.4	2.6	2.6
Plastic Surgery	1.3	1.4	1.1	1.3
Thoracic Surgery	0.5	0.7	0.7	0.7
Urology	2.1	2.3	1.9	1.8

*Primary care specialities

Source: AAMC Graduation Questionnaire

The percentage of U.S. seniors planning certification in the primary care specialties has fallen from 30.7% in 1986 to 23.6% in 1989. The support specialties have been the principal gainers.

TABLE 2

Since entering medical school, have you seriously considered another specialty other than the one you selected?	All Schools			
	1988		1989	
	Number	Percent	Number	Percent
No	2389	25.1	2454	24.0
Yes	6868	72.1	7566	74.1
No Response	275	2.9	184	1.8
	9532	100.0	10204	100.0
Not applicable (did not indicate seeking certification)	847		971	
If yes, which one?				
Allergy and Immunology	25	0.4	38	0.5
Anesthesiology and Critical Care	184	2.7	265	3.5
Dermatology	129	1.9	153	2.0
Emergency Medicine	279	4.1	373	4.9
Family Practice	693	10.0	754	10.0
General Internal Medicine	926	13.5	829	11.0
Internal Medicine Subspecialties	655	9.5	848	11.2
Neurology and Child Neurology	225	3.3	263	3.5
Nuclear Medicine	5	0.1	5	0.1
General Obstetrics - Gynecology	573	8.3	604	8.1
Obstetrics - Gynecology Subspecialties	NA	N.A	51	0.7
Ophthalmology	47	0.7	157	2.1
Pathology	84	1.2	83	1.1
General Pediatrics	539	7.8	546	7.2
Pediatric Subspecialties	122	1.8	156	2.1
Physical Medicine and Rehabilitation	50	0.7	70	0.9
Preventive Medicine	14	0.2	21	0.3
Psychiatry and Child Psychiatry	268	3.9	302	4.0
Radiology	74	1.1	67	0.9
Diagnostic Radiology	130	1.9	149	2.0
Therapeutic Radiology	17	0.2	26	0.3
General Surgery	743	10.8	771	10.2
Orthopedic Surgery	323	4.7	371	4.9
Otolaryngology	135	2.0	156	2.1
Urology	79	1.2	103	1.4
Other Surgery	355	5.2	405	5.4
No response	23	0.3	0	0.0
	6868	100.0	7566	100.0

Source: 1988 and 1989 Medical Student Graduation Questionnaire

tion and medical practice that provide a rather constant spectrum of specialty choices.

When certain specialties, such as general internal medicine, family practice and general pediatrics, begin to be chosen at a lesser rate and the downward trend continues over several years there is consternation. Why are graduates eschewing the primary care specialties? What can be done to reverse the trend? The answers are not apparent. One approach is to determine if students who have considered a specialty are turning away from it and why. Table 2 shows the responses to the question, "Since entering medical school, have you seriously considered another specialty other than the one you selected?" If you have, which one. Among the 6,868 who responded, "yes" to this question, 926 had considered general internal medicine, 693 family practice and 539 general pediatrics. The distribution among other specialties approximates the percentages that choose them.

Tables 3 and 4 show the factors that influenced decisions for and against specialty choices for the 1988 and 1989 graduating classes. The intellectual content of the specialty was cited as the first factor by 30% as their reason for choos-

TABLE 3

Which of these factors made you decide on the specialty you have chosen?	All Schools			
	1988		1989	
	Number	Percent	Number	Percent
Excellent courses/clerkships in the area	703	7.4	853	8.4
Examples(s) of a physician in this specialty	948	9.9	1204	11.8
Working hours	410	4.3	434	4.3
Good income (relative to other specialties)	66	0.7	66	0.6
Prestige within the medical profession	29	0.3	33	0.3
Intellectual content of the specialty	2861	30.0	3042	29.8
Challenging diagnostic problems	951	10.0	980	9.6
Minimum uncertainties in diagnosis and therapy	94	1.0	117	1.1
Encouragement from faculty	41	0.4	59	0.6
Encouragement from other students	6	0.1	NA	NA
Encouragement from other students/residents	NA	NA	54	0.5
Encouragement from family	27	0.3	NA	NA
Encouragement from practicing physicians	NA	NA	70	0.7
Lack of overcrowding in field	59	0.6	49	0.5
Type of patients encountered	1565	16.4	1627	15.9
Possess necessary skills/talent	944	9.9	940	9.2
Level of educational debt	NA	NA	13	0.1
Length of residency	19	0.2	9	0.1
Diversity, enjoyment	231	2.4	190	1.9
Content of specialty	115	1.2	59	0.6
Other	291	3.1	338	3.3
No response	172	1.8	67	0.7

Source: 1988 and 1989 Medical Student Graduation Questionnaire

TABLE 4

If you have seriously considered another specialty, which of these factors made you decide against that specialty?	First Factor			
	1988		1989	
	Number	Percent	Number	Percent
Negative clerkship experience	676	9.8	842	11.1
Too demanding of time and effort	1169	17.0	1373	18.1
Insufficient income potential	49	0.7	65	0.9
Not enough challenge	624	9.1	751	9.9
Lacks prestige	72	1.0	74	1.0
Inconsistent with personality	951	13.8	1205	15.9
Excessive emotional stress in the field	343	5.0	333	4.4
Lack the ability required	55	0.8	73	1.0
Don't like the type of patients	444	6.5	512	6.8
Malpractice insurance costs prohibitive	174	2.5	137	1.8
Overcrowding in field	221	3.2	189	2.5
Difficulty in getting a residency	314	4.6	319	4.2
Length and cost of residency	175	2.5	171	2.3
Discouragement from faculty	78	1.1	85	1.1
Discouragement from other students	12	0.2	78	1.0
Discouragement from family	29	0.4	NA	NA
Discouragement from practicing physicians	0	0.0	114	1.5
Prefer specialty I chose more than the one I did not choose	433	6.3	297	3.9
Too restricted or narrow	214	3.1	125	1.7
Other	606	8.8	642	8.5
No response	229	3.3	149	2.0
	6868	100.0	7566	100.0

Source: 1988 and 1989 Medical Student Graduation Questionnaire

ing. The type of patient encountered was cited next most frequently and examples (or role models) of physicians in the specialty was third most. Level of debt, income potential, length of the residency training requirements were cited by less than 1% of the respondents.

For those who had decided against a specialty the most frequently cited first factor was, "Too demanding of time and effort" (18%). The next most frequent was, "Inconsistent with personality" (16%). "Negative clerkship experience" (11%), "Not enough challenge" (10%); and, "Don't like the type of patient" (7%) were the remaining significant factors. It is notable that the only factor among these five that is directly amenable to educational intervention is, "Negative clerkship experience." "Insufficient income potential", was cited by only 0.9%.

Because of the concern about the decline in interest in the primary care specialties I have looked at the reasons cited for and against choosing them by the classes of 1988 and 1989 (Tables 5 and 6). In Table 5, general internal medicine, pediatrics and family practice are compared to general surgery. Intellectual content was overwhelmingly the reason cited by those who chose internal medicine. The type of patient encountered was most frequently cited by those selecting pediatrics and family practice. Family practice aspirants were influenced in their decisions by examples of physicians in their specialty much more frequently than the other primary care specialties. For future surgeons the intellectual content and the perception that they had the necessary skills were the most important factors.

In Table 6 the first factors for not choosing the primary care specialties are compared to those for not choosing general surgery, orthopedics, anesthesiology and radiology for both 1988 and 1989 graduates. "Negative clerkship" was cited by 16% of those choosing against general internal medicine and pediatrics in 1989. The next

TABLE 6

Six Most Frequently Cited First Factors for Why A Specialty Was Not Chosen Among Selected Specialties

	Negative Clerkship	Too Demanding	Not Enough Challenge	Inconsistent With Personality	Type of Patient	Difficulty Getting Residency
	(In Percentages)					
All Respondents						
n=6868 (1988)	9.8	17.0	9.1	13.8	6.5	4.6
n=7566 (1989)	11.1	18.1	9.9	15.9	6.8	4.2
Family Practice						
n=693 (1988)	7.4	15.2	13.9	10.2	8.4	0.3
n=754 (1989)	8.9	14.7	13.1	11.9	10.6	0.1
Gen Internal Med						
n=926 (1988)	14.9	18.7	2.2	17.7	14.9	0.1
n=829 (1989)	16.0	16.6	4.5	20.0	13.8	0.1
General Pediatrics						
n=661 (1988)	12.1	9.6	20.0	9.6	4.6	0.0
n=546 (1989)	16.3	12.6	17.4	8.8	3.5	0.0
General Surgery						
n=743 (1988)	9.4	37.1	2.2	16.7	1.5	1.3
n=771 (1989)	9.6	39.3	4.7	19.2	1.0	1.2
Orthopedic Surgery						
n=323 (1988)	10.8	19.2	7.4	15.2	0.6	20.1
N=371 (1989)	10.5	28.3	8.9	15.9	1.3	16.4
Anesthesiology						
n=184 (1988)	6.5	3.3	20.1	23.4	2.7	2.2
n=222 (1989)	7.7	1.4	32.2	26.1	1.4	5.0
Radiology						
n=221 (1988)	6.8	0.9	16.3	28.1	1.8	14.0
n=149 (1989)	9.4	2.7	18.1	28.2	3.4	10.7

[Factors limited to those that 10% or more of a cohort cited.]

Source: 1988 and 1989 Medical Student Graduation Questionnaire

TABLE 5

First Factors in Choosing a Specialty

	Internal Medicine n=550 (1988) n=443 (1989)		Pediatrics n=494 (1988) n=388 (1989)		Family Practice n=1027 (1988) n=1145 (1989)		Surgery n=587 (1988) n=416 (1989)		All Respondents n=7555 (1988) n=8384 (1989)	
	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989
	(In Percentages)									
Intellectual Content	46.3	47.0	10.9	4.6	8.9	11.5	20.6	19.0	30.0	29.8
Type of Patient Encountered	10.6	8.8	59.9	70.4	33.1	31.4	7.2	7.0	16.4	15.9
Challenging Diagnostic Problems	15.4	13.3	4.9	1.8	5.6	6.4	12.1	13.2	10.0	9.6
Example(s) of a Physician in the Specialty	7.8	8.8	6.9	8.2	18.4	21.2	13.3	13.5	9.9	11.8
Excellent Clerkship	6.5	7.4	7.5	5.4	3.4	3.7	11.4	14.4	7.4	8.4
Possess Necessary Skills/Talent	4.0	5.4	3.2	4.6	10.9	8.5	17.5	16.6	9.9	9.2

[Factors limited to those that 10% or more of a cohort cited.]

Source: 1988 and 1989 Medical Student Graduation Questionnaire

highest was orthopedic surgery at 10.5%. "Too demanding", was cited by 15% for family practice, 17% for general internal medicine 38% for general surgery and 28% for orthopedics. "Not enough challenge", was given as the reason for not choosing family practice by 13%, pediatrics by 17% anesthesiology by 32% and radiology by 18%. "Inconsistent with personality", was cited most frequently by those choosing against radiology and anesthesiology while those choosing against general pediatrics cited it least frequently. "Don't like the type of patient encountered", was cited by 14% who decided against internal medicine and by 10% who chose not to enter family practice. "Difficulty in getting a residency position", was a significant factor only for those choosing not to be certified in orthopedic surgery and radiology.

TABLE 7

INDEBTEDNESS OF 1989 MEDICAL SCHOOL GRADUATES BY SPECIALTY CERTIFICATION PLANS

	Number	Mean Debt	No Dept	Debt >$50,000
All Respondents	10,710	$42,374	18.7%	28.6%
Anesthesiology	570	$41,901	16.0%	31.4%
Dermatology	214	$39,390	25.7%	25.2%
Emergency Medicine	335	$48,709	16.7%	38.1%
Family Practice	1,107	$41,005	15.2%	27.5%
Gen. Internal Medicine	425	$43,355	17.2%	26.9%
Int. Med. Subspecialties	690	$43,602	17.5%	30.4%
Neurology	193	$45,144	20.7%	31.1%
Obstetrics/Gynecology	553	$45,757	18.3%	33.2%
Ophthalmology	318	$39,140	24.5%	22.3%
Pathology	197	$38,041	21.8%	22.8%
Gen. Pediatrics	370	$37,709	17.3%	23.2%
Pediatric Subspecialties	140	$44,427	17.1%	30.0%
Physical Medicine & Rehab.	163	$47,792	18.4%	31.3%
Psychiatry	523	$43,521	16.1%	32.9%
Diagnostic Radiology	500	$43,140	20.0%	28.4%
Therapeutic Radiology	75	$45,293	13.3%	32.0%
General Surgery	397	$41,681	18.9%	27.2%
Neurological Surgery	91	$43,940	18.7%	33.0%
Orthopaedic Surgery	478	$42,340	20.9%	27.2%
Otolaryngology	212	$42,164	19.3%	27.4%
Thoracic Surgery	54	$48,646	27.8%	33.3%
Urology	146	$38,288	25.3%	21.9%

Source: AAMC 1989 Graduation Questionnaire

The cohort with the highest level of indebtedness contains the 335 who plan to be certified in emergency medicine. The 54 planning certification in thoracic surgery also have a high level of debt. Other surgical subspecialty aspirants have debt levels below the mean. The cohort with the lowest level of debt is general pediatrics.

Table 7 shows the mean debt, the percentage not indebted, and the percentage with debts of $50,000 or more for 1989 graduates. The specialty with the least mean debt was pediatrics at $37,709, 11% below the mean debt of all respondents. The highest debt was reported by those planning certification in emergency medicine. Their mean of $48,709 was 12% above the overall mean.

The specialty with largest percentage with no debt was thoracic surgery (28%) followed by dermatology (26%) and ophthalmology (25%). The specialties with lowest percentage that had no debt (thus, more were indebted) were therapeutic radiology and family practice. Debts of $50,000 or more were reported by 38% of those planning emergency medicine. At 32% to 33% obstetrics, therapeutic radiology, neurosurgery and thoracic surgery were the next highest ranking specialties with debts of $50,000 or more.

These data are consistent with the low priority placed on income potential as a factor in both choosing and not choosing a specialty. They are counter to the often expressed view that high levels of indebtedness force students to choose the high income specialties.

CONCLUSIONS

As I stated at the outset, the reasons why students choose various specialties are complex and difficult to predict. The following are some conclusions:

- The U.S. medical education system induces a remarkably constant spectrum of specialty choices among its graduates.
- Precipitous changes in the proportion of

graduates choosing a specialty are rare. Trends of increase or decrease occur over a period of years and are usually detectable from the data provided by the AAMC graduation questionnaire.

- The factors cited for choosing or not choosing a specialty have face validity, few are amenable to direct educational intervention.

- The frequency that a negative clerkship experience was cited for not choosing general internal medicine or pediatrics strongly suggests that changes in clinical clerkships in those specialties should be undertaken.

- Educational indebtedness is not a strong determinant of specialty choice.

Howard K. Rabinowitz, M.D.
Department of Family Medicine
Jefferson Medical College

THE ROLE OF ADMISSIONS POLICIES IN MEDICAL EDUCATION

1. Admissions policies are a small part of medical education, but are a critically important component.

   - Bump into areas, i.e., career choice, ambulatory care, change in medical schools.
   - More applicants than places; admissions serves as a "gatekeeper" of who gets in.
   - Purpose is to provide the "best" candidate. Whose definition of best?

2. Current Admissions criteria were designed and are still used to minimize the attrition and failure rates of medical students.

   - It works pretty well, i.e., 2-1/2% attrition, but it has other very significant unintended effects.

3. In fact, despite its success in minimizing attrition, it's remarkable how much criticism there is regarding the Admissions process, mainly its overemphasis on standardized testing (e.g., GPA and MCAT).

   - GPEP report (AAMC, AMA Report on Future Directions in Medical Education, and Macy Foundation's National Seminar on Medical Education).
   - One such area where current Admissions process has caused major problems, is in reinforcing the trend toward subspecialization in this country. Or, as Henry Rosovsky, Dean at Harvard College, says the "Disease of Specialization". Now, disease may seem to be a strong word, but Webster defines it as a "condition that society regards as harmful". Using an infectious disease model, one streptococcus probably doesn't do any harm, in fact, it might help; but too many streptococci can have serious effects. So it is with subspecialists!

4. The flip side of too many subspecialists is not enough primary care doctors. The first report of COGME to the Secretary of HHS reaffirmed that there is an undersupply of most primary care physicians, and a definite undersupply of family physicians.

   - And the current Admissions Policies, which select the most academically competitive candidate with the highest GPA and MCAT, do not favor the type of applicant with the greatest likelihood of selecting primary care/family medicine.

5. Who are these people likely to eventually enter family medicine?

   - Rural background
   - Older/married
   - Slightly lower GPA/MCAT. People worry regarding lowering standards, but standards can be lowered in a statistically significant manner, but without having any practical meaning. For example, MCAT scores decreased from 9.7 to 9.4 from 1985 to 1989 without practical significance. Likewise, Science GPA decreased by 1/10th of a point, and Nonscience GPAs by 1/20th of a point during this same time period. Also, considering the lower GPA and MCATs of applicants who eventually practice Family Medicine, it is of interest that these same candidates have among the highest National Board scores on Part II and Part III!
   - Humanistic versus scientific experiences and interests.

- Public college.

- Initial interest in Family Medicine.

6. Considering these, is it possible to broaden the Admissions criteria with the purpose of influencing (? regulating) specialty choice?

   - Some may have concern whether this is the responsibility of medical education. But even if medical educators don't agree that it is their responsibility, the U.S. population and Congress will!

   - And by accepting different people into medicine, can we change the balance of graduates going into different specialties?

   - Ernst and Yett, in a 1985 book entitled Physician Location and Specialty Choice, reviewed the literature regarding this and concluded that "physicians tastes for specialty and location, reflected in their background and personality traits, seem to affect their career decision more than either pecuniary interests or learning experiences."

   - Think of why we entered the profession we did. Would the same person who enters the military be equally likely to do social work? Would physicians choose law? Why did I give up a quarter of a million dollars each year that I could have made doing cardiac surgery?

7. This is all starting to sound like preferential admissions. Words which have a negative connotation because they sound like giving someone an unfair advantage.

   - But in reality, preferential admission is a generic term, an everyday activity. Our current system is actually one of preferential admission. We "prefer" (or as Webster says choose) people with high MCATs, high GPAs, research experience, urbane interests, alumni, state residence or under-represented minorities.

8. Well, let me tell you about what we've done at Jefferson Medical College, because we have made a significant change in our Admissions Policy.

   - In the early 1970's, there was a lot of concern regarding geographical maldistribution of physicians, concerns which still exist.

   - Our Dean, Will Kellow, like all deans wanted to develop a program to: A) do good, and B) bring money into the medical school. He was successful in the first, but not in the second.

     He developed a program that would increase the number of physicians in rural areas of Pennsylvania. While he hoped for state support for the program, this never came through.

9. Jefferson Medical College is the largest private school in the country, with a long tradition of training clinicians.

   The literature base at the time showed that the University of Illinois had had a preferential admission/loan program from 1948 to 1964. As reported by Matson, this program was successful in increasing the percentage of physicians practicing in rural Illinois, as well as those entering general practice.

   The literature base also showed that two subgroups of physicians were consistently identified as likely to practice in rural areas, physicians who grew up in rural areas, and family physicians. And combining these two factors had a cumulative effect.

10. Dean Kellow realized that to increase physicians in rural areas, therefore, he needed to focus on Family Medicine, since family physicians are the doctors of rural America.
    In addition, common wisdom asserts that predicting future specialty choice is fraught with danger, since everyone changes their mind. Actually, everyone doesn't change their

mind. It is true that most students who enter medical school with plans to be a family doctor, in fact do not. Only 24% enter Family Medicine. But more importantly, if students enter medical school with an interest in any other specialty besides Family Medicine, only 8% changed into Family Medicine. Students initially interested in Family Medicine, therefore, are three times as likely to enter Family Medicine as their peers.

Based on these principles, Jefferson initiated its Physician Shortage Area Program or PSAP in 1974. Twenty-four places for Admission to each freshman class are reserved for PSAP students, representing 10% of the class. PSAP preferentially selects applicants for medical school from rural backgrounds who intend to practice Family Medicine in rural areas.

Applicants are required to have personal letters of recommendation from three citizens in their community, and are judged during their medical school interview regarding their commitment to practice rural family medicine.

In addition to preferential admission, the PSAP also provides students with financial aid in excess of that routinely given to Jefferson students, almost entirely in the form of loans, and averaging $2,000 per student per year. Students who enter the PSAP have a Family Medicine faculty member as an advisor throughout the four years of medical school. In addition, PSAP students take Jefferson's required third year, six-week Family Medicine clerkship at one of the two rural affiliated family practice centers; and take their senior outpatient subinternship in Family Medicine, usually at a rural preceptorship site. PSAP students are also expected to take a three-year Family Medicine residency, and to practice Family Medicine in a rural area, preferably in Pennsylvania, on completion of their residency, although no formal mechanism exists in order to insure compliance on these last two items.

- Only academically qualified students are recommended for acceptance to the program, and PSAP students have science and nonscience grade point averages equal to the regular matriculants; their MCAT scores, however, are slightly lower, ranging from 0.2 to 0.9 lower per subtest.

- Evaluation of the PSAP after 12 years has shown that PSAP students have performed similarly to their classmates during medical school and residency training, as measured by attrition rate, grades, National Board scores, and residency evaluations. PSAP graduates, however, are five times as likely as their peers to be practicing Family Medicine (60% versus 12%) and four times as likely as their classmates to combine a career in Family Medicine with practice in a rural area (approximately 30% versus only 4%).

- What about those graduates who did not practice both Family Medicine and in a rural area. They're practicing either primary care or in a rural or one of the smallest metropolitan areas. In fact, only 7% of the PSAP graduates are practicing a non-primary care specialty in a large urban area, where most of their non-PSAP peers are located.

11. Jefferson's PSAP was successful in increasing the number of primary care doctors in rural areas.

    - There's no question in my mind that Admissions was a major part of the success, but not the only reason.

    But, why were PSAP graduates more than twice as likely to enter Family Medicine? Was it their rural background? Commitment to the program? The loans? The Family Medicine advisor?

12. While I don't have the answer to this question, I believe some of the major reasons include:

    - Institutional commitment: Without this, there wouldn't have been a PSAP. In fact, perhaps the most important question is not why it worked, but how did we get it in place?

    - A strong department of family medicine.

    - Excellent clinical care on campus.

    - Role models, both faculty and residents. Not only do students have lots of faculty supervision in Family Medicine, but Family Medicine Residents who rotate through all other major departments, act as role models. Students see Family Medicine residents on Medicine, Pediatrics, Obstetrics, etc. When I spoke last year to students at the University of Pennsylvania Medical School, they had never seen a family physician see patients. How can you expect them to consider Family Medicine as a career?

    - Curriculum: Jefferson's required third year. The six-week clerkship for all 223 students began in 1974. It is structured (University FPCs and six affiliate FPCs with residencies), didactic (a core curriculum of common ambulatory problems/diagnoses, with readings and a lecture series; and a modified essay question final examination, which tests problem-solving skills, and correlates with attitude measured in residency better than other evaluative methods), and experiential (students see 50 to 100 patients per clerkship, supervised mostly by fulltime faculty, and representing a broad array of medical problems).

13. What about the future? Considering what I've said about the importance of an initial interest in Family Medicine who eventually goes into Family Medicine, the recent data from the **AAMC**, showing a 30% decline in medical school applicants who are interested in Family Medicine—from 9.7% to 6.9%, from this year's graduating class and lasting over the next three years, is of concern.

14. Summary

    - Admissions Policies are a critically important part of medical education.

    - Currently these policies do not favor candidates interested in primary care—they can however, be modified without changing standards in any practically significant way (even if they do change statistically). These modifications have the ability to achieve other goals in addition to minimizing failure, such as increasing the number of primary care doctors.

    - As Jason has said:

"The selection process in education is the equivalent of the genetic code in human development."

Parker A. Small, Jr., M.D.
Professor of Immunology
and Medical Microbiology
Professor of Pediatrics
College of Medicine
University of Florida

THE BASIC SCIENCE YEARS

It is a privilege to participate in this conference. I want to try to convince this commission to put forth three recommendations. First, to change the reporting of national board scores to pass-fail. Second, to expand the use of peer evaluation, and third, to propose a study comparing rote learning with meaningful learning. I also would like to share some ideas about an improved medical school curriculum.

Teaching is basically deciding what we want to teach, how we are going to teach it, and how we are going to evaluate what was learned. It is evaluation that drives the system. When the evaluation system is in synch with the goals of what we want our physicians to do, then we should teach to that test. But I would propose that our national board exam is not in synch with most of the needs of physicians and is misused in terms of being utilized by residency selection committees and for measuring the effectiveness of medical schools. My request of COGME, is that you recommend the reporting of national boards only by pass-fail. A number system (e.g., a 700 in medicine and a 650 in surgery) should no longer be used. The purpose of this recommendation is solely to decrease the inappropriate emphasis put on national boards, and thereby decrease what I perceive to be the inappropriate pressure that national boards are putting on the medical education learning system.

We have said that the evaluation system drives medical education; however, I believe the evaluation is largely "selfless" and "peerless". Self-evaluation is what determines how competent a professional one becomes. That is the feedback loop that truly determines the quality of ones performance. Virtually no attention is given in medical school to self evaluation. I am unsure of the type of recommendation COGME could make about self evaluation, but it is important to recognize a need for more attention being given to self-evaluation.

I would like to focus on peer evaluation because it is peer evaluation that determines how successful we are as professionals and because I have some experience in this sphere. Peer evaluation is virtually non-existent in most medical schools.

I specifically want to focus on some of our research and experiences over the last two decades. To begin with, there can be no meaningful peer evaluation if the instruction inhibits or avoids peer interaction. For example, peer evaluation in lecture courses seems futile. Therefore, we must begin by discussing instructional methodology that promotes peer interaction. I was enamored with small group teaching, but the resources required for small group teaching were significant, and that is when I decided that if you applied the technology of self-instructional materials to groups, i.e., developed the materials for the group, that you could then do potentially exciting things. The idea resulted in the creation of a system called the Patient Oriented Problem Solving System (POPS) which my colleagues and I developed at the University of Florida. The system has been made available free to medical schools throughout the United States by the Upjohn Company. It is now in use in about two-thirds to three-fourths of U.S. medical schools. It is a system designed to promote small group learning. There are seven topic documents, for example, immediate hypersensitivity. Each document occupies about two to three hours in the life of four medical students. Before students come to class, staff give them objectives of the system, objectives of the package, and a pretest. The pretest consists of the objectives translated into multiple choice questions. Students complete the pretest before coming to class. In class they each get a different colored booklet which includes the answers to

one-fourth of the pretest questions. They then must depend upon their peers for the answers on the other three-fourths of the pretest. After reviewing the pretest answers, one medical student presents the first patient to the group. The group must then decide how they are going to proceed, discuss the plan, and agree as a group as to the appropriate steps. The student that presents the patient has the correct answers to assure that it is not the "blind leading the blind." Over the course of two to three hours, students work through their clinical problem. When they are using the tetanus package, they think they are learning how to treat tetanus. I think they are learning primary versus secondary immune responses and active versus passive immunization. For those students who have never had immunology, they are developing a working definition of antigen and antibody. It works well.

Students work in groups of four either in an environment where we provide a limited number of instructors (one graduate student for about 30 students) to answer questions and help them out, or if they prefer, they can go to a more pleasant environment and work on their own. Pretests and post tests used at the time of the activity demonstrate that learning occurs. Post-testing three years later shows 90 percent retention of major concepts learned in this format whereas the control group that utilized the standard lecture format had only about a 50 percent retention rate. We also had five senior medical students from our class and four senior control students who had not used POPS discuss the process with me. This was actually a set-up. I had a nurse colleague out in the hall. As the students approached, she walked up to them and told them that her husband just stepped on a rusty nail, and she wanted to know what he should do. The medical students described the encounter to me, and I asked them what they had told her. Then I asked them where they had learned about tetanus. The five students that had participated in the POPS program not only remembered the facts but the discussion they had with other students while they learned about it. Even though it was three years ago, they remembered most of the information. The control students did not do nearly as well. All nine students had had a recent lecture on the subject but in the "clinical setting" could not retrieve any of that information. This was probably because they had not learned it in a clinical context, and, therefore, could not recall it in a clinical context.

Given the interactive learning system, I would now like to address our peer evaluation system. At Florida we have a formative peer evaluation which occurs after the four students work together. We give each student a blank piece of paper with a line for the names of their three students and their own name. The only question asked is how much did that student help you learn. Students are requested to give each of their three peers a numerical rating of 0, 1, 2, or 3. A two means they helped like anybody else. A three means they were outstanding, and if they were outstanding at helping their peer learn, I ask that the student tell me in one or two sentences what that peer did that was extra special.

If they give a fellow student a one, it means they neither helped nor hurt the student's learning. That usually is because the peer came unprepared. A zero means you would have learned more if that peer had not been in the group. Zeroes and ones also require comments. I give these comments to each student to serve as formative evaluation. The summative peer evaluation of cooperative learning at the end of the first year course includes evaluating each of the 21 students they have worked with. Students must divide 21 points among these 21 peers in proportion to how much they helped the student learn.

In the senior year, we have peer evaluation of professional competence. Students are asked to list the three people in their class that they would most like to have at your side in a medical emergency, the ones that they think will make the best doctors, the most likeable, the ones they would most like to invite to a party, etc. For the 10 years we have used this system, factor analy-

sis has shown that 50 to 60 percent of the variance has been accounted for by factor 1 which weights on the professional competence questions and only 25 percent of the variance is accounted for by factor 2 which weights on the social questions. Factor 1 is our senior year measure of professional competence. Through this process we have been able to identify the top 20 to 25 percent of the class. We have found that the first year measure of cooperative learning is the best predictor (R>.5) of factor 1 scores (professional competence) and that standard admission criteria (or MCAT and GPA) have no statistically significant correlation with factor 1.

My second request is that you recommend expanded use of peer evaluation. I strongly believe there is a need for more of it in medical education. In my ideal world, I would like to even change the behavior of the university registrar. Now, I recognize that this may be the ultimate folly, but I would like to see two grades for each course. One would be the standard cognitive grade that we all know and love, and the other a cooperative learning score. In a society that is getting ever more complex and specialized, the need to be able to work together and share information, is even more important. Unfortunately, from kindergarten through medical school, we label that cheating and punish it rather than reward it. These considerations go way beyond medical schools. If a business firm was looking for somebody to work in the back corner of a lab, they might look only at cognitive grades. If they were looking for a salesman, they might consider looking only at their cooperative learning grade. However, if they were looking for the president of a firm (or a medical student), they would want both.

I would like to briefly discuss basic science education. From watching medical students for over two decades, it appears that the first two years of medical school, for the majority of medical students, is primarily memorizing answers to questions they are not yet asking. It may be that such memorization is actually of negative value! To better understand this possibility, I want to share with you some ideas that Joseph Novak provides us in his enlightening book, A Theory of Education. He discusses "rote learning" as useful when you need to know telephone numbers. In contrast he discusses "meaningful learning" which is learning that causes you to link new concepts with more than one other concept. For example, using rote learning one links a telephone number with a name. However, what you learn by rote cannot be used for problem solving. Novak even suggests that rote learning inhibits the re-learning of the same material or related material in a problem-solving (meaningful) mode. If this assertion is true, it necessitates serious rethinking of much of basic science education as well as education in other fields. Thus, my third request of you is that your commission recommend that there be a much more extensive study as to whether rote learning is a precursor to meaningful learning or whether rote learning inhibits meaningful learning and/or inhibits the re-learning of that same material in a way that will make it useful for problem solving.

I think Novak is probably correct and that we must, therefore, totally rethink how basic sciences are taught. I would like to describe for you what would be my ideal basic science curriculum. It would begin when the students first come to medical school. In the first few months they would learn how to do a physical, how to take a history, how to access the information in the library, (how to use Medline, how to find journals and text books), how to identify what information they need to problem solve. As soon as they have completed that, I would like to see them go out into practicing physicians' offices in primary care settings for a month. This could possibly be very effective continuing medical education for the physicians, because we could send students into the practices equipped with desktop computers with modems so they can access Medline, with fax machines in the office with a linkage back to the library system, so that while the physician is helping the student learn what medicine is all about, the students can bring the clinician up to date reference material. The library can monitor the requests, and can also learn what information the practicing clini-

cians need the most. It is a potential symbiotic arrangement that I think would excite medical students, excite practicing physicians, and be beneficial to both groups. When the medical students return to their basic science curriculum, they would be much better equipped to constructively criticize the curriculum. If these students were empowered (adult-adult relationships with faculty rather than parent-child relationships) the ensuing dialogues would almost guarantee the evolution of a more effective curriculum.

Larry Culpepper, M.D.
Department of Family Medicine
Brown University Memorial Hospital

AMBULATORY SETTINGS FOR CLINICAL EDUCATION

INTRODUCTION

During recent decades there have been repeated calls to medical schools to increase the presence of ambulatory care in their curriculum and to increase the number of graduates who enter family practice and primary care careers. These two needed changes, though intertwined, are not synonymous (1,2). There are numerous reasons to increase the medical school involvement with ambulatory clinical experiences, and these go to the core of medical education (3,4). Without such changes, the medical school curriculum will not produce the minimum competencies required of physicians. The second thrust, to increase the percent of medical school graduates entering family practice and primary care specialties, is based on the health personnel needs of the country. Curriculum changes, possibly accompanied by change in the medical school application and selection process, are necessary if medical schools are to meet this national need. This presentation summarizes the rationale for an increase in the ambulatory focus of medical education, discusses the impediments to curriculum change, factors to be considered in planning such change, and options available to promote curriculum change.

RATIONALE FOR EMPHASIZING AMBULATORY EXPERIENCES

The reasons for restructuring medical school clinical experiences to emphasize ambulatory activities are related to curricular considerations and to the effects of such experiences on medical student specialty career choice [Figure 1].

CURRICULUM ISSUES

Morbidity Spectrum:

Students can see illnesses in the ambulatory setting that they do not see in the inpatient setting, including diseases that are not severe enough to require, or ones not therapeutically responsive to inpatient care (3,5,6). In recent years, hospitalized patients have become sicker but are hospitalized for briefer periods (7,8,9). Generally, students do not see diseases in the

Figure 1:
RATIONALE FOR AMBULATORY EDUCATION

1. CURRICULAR CONSIDERATIONS
   - Illnesses Not Encountered Through Inpatient Exposure
     - Specific Diseases
     - Early Presentation/Natural History
     - Episodes Of Illness
   - Clinical Activities Not Possible By Inpatient Exposure
     - Diagnostic Assessment Of Ambulatory Problems
     - Limited, Focused History And Physical
     - Managing Chronic Disease/Disability
     - Health Maintenance And Promotion
     - Health Behavior Modification Counseling
     - Ambulatory Procedures
   - Patient Management Processes
     - Negotiation Of Care With Autonomous Patients
     - Consultation And Referral
     - Community Agency Involvement
     - Use Of Time In Clinical Care
     - Ambulatory Record Systems
     - Resource Management & Cost Issues
     - Practice Management
   - Attitudinal Issues Critical In Ambulatory Setting
     - Treat Patients With Compassion, Respect, Integrity
     - Individualize Care To Patient's Social, Emotional, Financial, Educational Characteristics; Values, Lifestyle; And Explanatory Models
     - Ethical Considerations
     - Bio-psychosocial Model
   - Exposure To Dynamics Of Medical/Social Failures Leading To Hospitalization
     - Failures Due To Characteristics Of Individual Patients
     - Failures Due To Doctor And Doctor-Patient Relationship
     - Failures Due To Biologic And Genetic Issues
     - Failures Involving Social Issues
2. CAREER CHOICE ISSUES
   - Exposure To Ambulatory Practices
   - Exposure To Ambulatory Aspects Of Subspecialty Practice
   - Exposure To Primary Care Role Models
   - Exposure To Alternate Approaches To Managing Breadth Of Medical Information

inpatient setting that are early in their course. By the time of admission, many patients either have become severely symptomatic, or have been diagnosed in the ambulatory setting before admission. Therefore, students are left out of the most important initial stages of the diagnostic process (2).

Inpatient contact does not routinely impart an understanding of the natural history of diseases or the concept of episodes of illness (2). For example, medical students seeing the myocardial infarct patient in the hospital may be exposed to the immediate treatment of coronary artery disease, but not to how it develops, responds over time, or progresses.

Clinical Activities:

Some clinical activities that medical students need to learn do not occur on inpatient units (3,10). The lack of involvement in the diagnostic assessment of ambulatory problems has been mentioned. Medical students need to learn how to conduct appropriately limited and focused histories and physicals, in addition to the complete history and physicals taught on inpatient rotations. Students also have very little exposure to diagnostic and therapeutic procedures that are best done in an ambulatory setting.

There is little emphasis on concepts regarding the long-term management of chronic disease or disabilities during most inpatient experiences (7). Often, there is little attention to considering the full range of patient needs, or even to medical concerns occurring soon after discharge. For example, for physicians who treat diabetics, a common experience is to have medical students develop very precise inpatient control of glucose levels only then to have to deal with hypoglycemia once the patient has been discharged and increases activity.

Health maintenance and promotion concepts are poorly conveyed by inpatient care (3). During students inpatient experiences such activities often consist of checking off the medical record box of whether they did a breast exam, and writing in excuses for why they did not do the rectal exam. The inpatient health behavior modification counseling process often consists of using one-time scare tactics to tell patients that they are dying because they smoked for 50 pack years.

Person Centered Care:

Ambulatory care, particularly that which is part of primary care, is person centered rather than disease or procedure centered (3,11). This breaks from the nature of other curricular areas that generally involve universal concepts or ones that apply to large groups of patients with a disease. It is commonality that is stressed in most medical education rather than the individual nature of each patient. In contrast, outpatient care tends to stress an understanding of the personhood of each patient (4,5,12). This means students must learn the patient's name, learn about his or her life and social, emotional, educational, and financial background. They need to learn patient value systems, something about their lifestyle, and how they explain their diseases to themselves. These issues do not become critical factors often in the day-to-day management of inpatients.

Patient Management Processes:

The use of time in diagnosis, therapeutic assessment, management, and promotion of life-style changes is a much more important consideration as part of ambulatory care compared to inpatient care. In contrast, the efficiencies of inpatient settings encourage physicians to do everything at once early. Therefore, residents and students tend to order all possibly relevant tests during the first day or two following admission. When medical students and residents carry such approaches over to the ambulatory setting, major inappropriate use of resources occurs, and patients may be exposed to the dangers of over-testing (2,13).

Consultation and referral processes are different in ambulatory settings. The inpatient medical consultation process usually consists of tell-

ing the ward clerk to call in someone, or placing a phone call to the answering service or to the specialty consult secretary. For the student on the consult team, leaving a note in the chart often means never seeing the patient again. It is very different in the ambulatory setting, for both successful primary care physicians and subspecialty ambulatory consultants. Similarly, involving a community agency from an inpatient setting generally requires filling out a form telling an agency what to do, at a time when the student no longer will have any interest in or plan to see the patient again. It is a very different ambulatory process, particularly if a continuing relationship exists.

Resource management and cost issues are key factors to learn in the outpatient setting (3,5). If patients do not have prescriptions filled, it may be because they cost too much. Students may have to negotiate regarding costs with ambulatory patients, whereas on a DRG-reimbursed inpatient setting, costs often are not considered by medical staff. Most students have no concept of the costs of procedures or the charges associated with inpatient diagnostic tests.

The entire area of practice management is not considered on inpatient rotations, yet it becomes critical to the success of graduates once they set up practice. For example, many students have no concept that there is such a thing as an ambulatory record system. It is generally viewed as a file that is missing when students request it for review of an inpatient's past history.

Management issues pertain not only to working in and running an office, but to maintaining relations with patients and their families (11). Fortunately for inpatient educational activities, inpatients are very dependent and usually cannot escape medical students. This is not true in the ambulatory arena. Medical students need to maintain the ability to treat patients with compassion, respect, and integrity (14). They must learn how to negotiate, to be polite, say hello, and say goodbye to patients if they are to be successful. On inpatient units, these are not behaviors that are highly valued, or that must be learned to encourage patients to return for follow-up care. These are attitudes faculty need to stress but often cannot model fully using inpatient settings.

Exposure To Medical/Social Failures Leading To Hospitalization:

Increasingly, the clinical issues medical students are exposed to during inpatient rotations are the results of medical and social failures. Individuals who become treatment failures or society's failures often end up being hospitalized, and students see the results of these failures, but not the arena in which they occur.

Patient Characteristics: One set of failures that often result in hospitalization are due to the characteristics of the individual patient, their cultural background, their educational understanding of processes, their value systems (15). In hospitals, students see the results of some of the poor decisions patients make, or some of the right decisions patients make but under adverse circumstances. Medical students need exposure to such patients and the context of their lives at the time they are making those decisions.

Doctor and Doctor-Patient Relationship: On inpatient rotations, students also frequently see patients who represent failures either of the physician or the doctor-patient relationship. These include for example the patient that did not return for follow-up, such as the cancer patient who had a worrisome cervical Pap smear but did not return. Many inpatients are those with chronic diseases for whom outpatient medications have been inadequately controlled.

Societal Issues: Finally, students on inpatient rotations see failures involving social issues. In any large city public hospital ward, students see the results of poverty and homelessness and the results of a myriad of social problems. They see the end results but are not exposed to the ongoing dynamics of the society that creates those problems, or the ways medical care can be organized and provided (such as through community health centers) to ameliorate such effects (15,16,17).

SPECIALTY CAREER CHOICE

There are issues related to student career choice that support increasing medical school ambulatory experiences (18). Students need to be exposed to ambulatory practice whether they plan to go into subspecialty or primary care careers. There is a pressing need to expose students to successful primary care role models, and this can be done effectively only if ambulatory settings are integrated into the medical school curriculum. Most subspecialists conduct a major part of their activities in ambulatory settings, but students have little exposure to such subspecialty practice content. Students need a fuller understanding of the day-to-day realities of their career options in order to make informed choices. Sub-specialists approach the expanding breadth of medical knowledge through narrowing their professional focus of attention. In contrast, primary care physicians do so by developing skill at integrating knowledge (17). Medical students need exposure to both of these models in order to make informed career choices.

THE ACUTE NEED FOR CHANGE

There are a number of events in recent history that make acute the need for curricular change to increase medical student ambulatory exposure [Figure 2]. Already identified are the limitations of inpatient units: These are due to the shortened length of stay, to the increased severity of illness, and to the increased effectiveness of ambulatory and inpatient diagnostic and therapeutic modalities developed in recent decades. As a result, there is an increasingly restricted variety of morbidity and range of care processes occurring in inpatient settings (7,11). Development of ambulatory surgery and subspecialty treatment programs have contributed to this. In order to compete successfully, hospitals have developed specialized units to which students may not be exposed. For example, cancer treatment is increasingly moving into outpatient specialty programs. All of these changes are related to the epidemiologic transitions from acute to chronic illness and from infectious to lifestyle related morbidity that have occurred since the Flexner Report. As research programs are successful in developing effective prevention and intervention strategies and therapies, medical students need to learn how to use them where most are used most appropriately, which often is the ambulatory setting (8).

QUALITY OF AMBULATORY EDUCATION IS ESSENTIAL

If we are to successfully move education to the ambulatory setting, we must recognize that quality is essential (19). Simply shifting medical students to the outpatient arena will be counterproductive if they are then exposed to poor quality medicine, to demoralized physicians, and to inadequate clinic systems (1,7). Faculty must be available who are adequate to the task of ambulatory education. Most ambulatory settings need something that is now lacking strong, enlightened leadership in the ambulatory unit (20). We need medical school academic leadership to change the curriculum, but effective leadership within the ambulatory clinical set-

Figure 2:
DEFICITS IN MEDICAL EDUCATION MAKING NEED FOR CHANGE ACUTE

1. CONSTRAINED CONTINUUM OF DISEASE PROCESSES PRESENT ON INPATIENT UNITS
   - Shortened Length Of Stay
   - Increased Severity Of Illness/Intensive Nature Of Care
   - Increased Effectiveness Of Ambulatory Diagnostic And Therapeutic Modalities
2. RESTRICTED RANGE OF DISEASE AND CARE PROCESSES
   - Admission Review
   - Ambulatory Surgery & Treatment
   - Specialization Of Inpatient Units
   - Development Of Non-Hospital Care Options
3. EPIDEMIOLOGIC TRANSITION FROM ACUTE TO CHRONIC ILLNESS

ting is equally critical. It cannot be the responsibility of a rotating faculty whose duty it is to shore up the outpatient system for another month. Faculty directing ambulatory experiences need to develop ways of assuring appropriate case mix and student-patient loads in a clinical environment that promotes quality patient care and medical student education. This is particularly problematic if the medical education system is being used to provide ambulatory care no one else in society wants to provide.

FINANCIAL REALITIES

There are financial realities that must be considered regarding the move to an ambulatory curriculum (2,13,21,22,23). Dramatic changes occurred in the number of academic positions nationally during the 25 years 1960-85 (7). While the number of medical students and residents increased modestly, faculty positions increased 450%. During the same interval, federal research support to medical schools increased four-fold after inflation, from $133 million to $1.82 billion, and clinical support increased over thirty-fold after inflation, from $28 million to $2.98 billion. These economic realities have become the driving factors of medical school life, often displacing the curriculum. Maintaining patient volume, clinical income, and research income have replaced educational goals as the priority at the departmental level in many medical schools.

At the federal level, only hospital sponsored training activities are eligible for Part A Medicare support of related resident and faculty salaries, thus tying reimbursement to current hospital-based activities (21,24). In most states, Medicaid does not pay anywhere near its appropriate share of clinical costs, or participate in paying ambulatory educational costs. Most of the ambulatory services that are educationally relevant are cognitive, and involve reimbursement which may become more equitable following Relative Value Scale (RVS) based Medicare changes. Separate from implications for the scope of ambulatory curriculum financially sustainable by medical schools, RVS changes may result in family practice and primary care careers becoming more attractive to medical students.

Some studies have assessed the financial implications of educating residents and medical students in ambulatory settings (11,21). They find the major cost of moving residents out of hospital wards may be that of replacing them in the inpatient setting with nurse practitioners, physician assistants, staff physicians, or with increased time of clinical and academic faculty. For the ambulatory setting, senior residents are at least a break-even financial proposition. This is not true for first year residents. For medical students, the costs of providing adequate educational exposure has been calculated to involve about 40 minutes of preceptor time per student per half day. This must then be multiplied by the cost for preceptor time (25).

One issue that has been identified but not often used in financial planning is that ambulatory activities do generate other revenue. Perkoff documented that for every dollar generated in a family practice ambulatory unit, the system received one dollar generalized through related consultant billing and five dollars of additional income from resultant inpatient care (11).

IMPEDIMENTS TO CURRICULUM CHANGE

A number of faculty, environment, and curricular conceptual controversies exist that are impediments to increasing the use of ambulatory experiences in the medical school curriculum [Figure 3] (26).

Need for Strong Leadership:

Curriculum change will require strong leadership and interdepartmental collaboration among those knowledgeable about the organization and provision of quality ambulatory care. At many schools the medical leadership have never personally provided ambulatory care or may

have given it up many years ago (1,7,27).

Need For Experienced Faculty:

In most medical schools, there are few experienced faculty committed to ambulatory care and teaching in the ambulatory setting. While the growth of faculty practice plans at many schools has led to an increase in practicing clinical faculty, these often have little experience or commitment to teaching (2,3,7,28,29). They do provide a pool of potential teachers with ambulatory clinical experience. In addition, attendings, physicians from community health centers, rural sites and home care settings, may be excellent teachers, (30) especially following faculty development activities (31).

Figure 3:
IMPEDIMENTS TO CURRICULAR CHANGE

1. Need Strong Leadership And Inter-Departmental Collaboration By Medical School Faculty And More Faculty/Community Provider Interaction
2. Limited Faculty Experience With Ambulatory Care and Teaching, Especially Among Medical Leadership
3. Faculty Priorities Not Congruent With Ambulatory Teaching Research And Clinical Income Major Priorities
4. Prestige And Recognition Associated With Inpatient Activities
5. Ambulatory Education Less Time - Efficient And Convenient
   - Individual Rather Than Group Activity
   - Narrow Disease-Only Model Inadequate
   - Efficiency Due To Hospital-Based Time Schedules Not Possible
   - Efficiency Due To Pre-Processing Of Patients Not As Possible
   - Responsibility For Patients Greater
6. Hospital Dependency on Housestaff Decreases Housestaff Availability to Support Ambulatory Medical Student Education
7. Increased Face-to-Face Contact With Patients And Families Required
8. Ambulatory Care Emphasizes Management Rather Than Diagnosis; Individualization Rather Than Commonality Of Disease Processes
9. Less Exposure to Rare Diseases
10. Quality Of Ambulatory Facilities And Supports Often Dismal

Faculty Priorities:

Ambulatory roles connote low status for many medical faculties. Pressures related to academic promotion requirements are such that for most junior faculty ambulatory clinical or teaching involvement is a low priority (2,28,32,33). This is true both related to long-term commitment of blocks of time, and on a day-by-day basis. For senior faculty, because of its general low status nature, ambulatory duties are generally left to junior faculty, fellows and housestaff.

Recognition and Prestige:

Clinical accomplishments in the ambulatory setting tend to be individual and recognized only by the doctor involved (2,32). This is very different from the notoriety associated with an inpatient diagnostic coup and the prestige that comes from making the right diagnostic and management decisions in rounding situations with peers and faculty watching. At schools with practice plans, inpatient activities are usually much more lucrative for faculty than ambulatory care (11,21).

Educational Efficiency:

Ambulatory education is less time efficient and less convenient for faculty than inpatient education (2,11,34). Ambulatory education tends to be on an individual single faculty preceptor, single student, single patient basis rather than involving one faculty member making rounds with six or eight trainees seeing a group of patients. It is easy to organize and schedule inpatient activities so that a faculty physician may pop in, make rounds for an hour, accomplish educational responsibilities, and leave. It is much more difficult to schedule such efficient time use in ambulatory settings.

The faculty preceptor responsibility for ambulatory patients tends to be greater, particularly for primary care physicians (35). To provide successful models of ambulatory professional roles, faculty need to maintain significant involvement in their patients' lives, with a concomitant

increase in time commitment. As a result, a disease-only educational focus often is not feasible or appropriate with ambulatory patients (5). Faculty must integrate disease issues with each patient's individual needs. This is educationally and clinically desirable, but it takes time.

Housestaff Availability For Teaching:

Hospital inpatient service needs compete with housestaff availability to support ambulatory medical student education (2,30,36,37,38). Most teaching hospitals rely on housestaff to run their inpatient services and to accomplish much of the medical student teaching activities on the inpatient services. Because inpatient services demands are viewed as of higher priority, it is difficult to get the same intensity of housestaff educational involvement in the ambulatory setting.

Increased Patient Contact:

Ambulatory, in contrast with inpatient, activity requires much more face-to-face contact with patients and their families. Most time spent on inpatient rotations is not spent with patients. Some students and faculty find it grueling to spend hour-after-hour talking to human beings, and this becomes a real issue in acceptance of a curriculum switch from inpatient to outpatient focus (17).

Management versus Diagnosis:

A somewhat controversial issue involves determining the curricular goals and approaches related to ambulatory care. Management is usually emphasized in ambulatory care rather than diagnosis. As already discussed, in determining the teaching focus, this leads to an emphasis on individualization of understanding of patients rather than the commonality of disease processes (2).

Rare Diseases:

There is less exposure to thrilling rare diseases in an ambulatory setting. Medical students must wait a long time for the new leukemic patient to present to a primary care setting.

Quality of Ambulatory Facilities:

Already noted is the need for quality. This extends to ambulatory leadership, staff, and physical facilities. At many schools the status of these is abysmal due to neglectful funding decisions over the years (3,7,25).

REQUIREMENTS FOR EFFECTIVE CURRICULUM CHANGE

As noted above, it will take motivation and commitment from the top by boards of trustees of medical schools, by deans, chairmen, and senior faculty (1,14,25,32,39). This commitment must be accompanied by appropriate location of control in those capable of informed curriculum planning and implementation. It also will require support from subspecialty and research faculty if medical schools are to properly rebalance the medical curriculum. As part of this, medical schools need to adopt an outcome orientation. The curriculum needs to be focused on the type of physician graduates desired rather than the type of lectures faculty wish to give.

There are two sets of outcomes targetable in shifting toward an ambulatory curriculum. One, easy to measure, is the percent of graduates entering specialties that are national health personnel priorities. Medical school applicant selection and curriculum should result in 50-70% of graduates entering primary care practice if national needs are to be met. A second, harder to measure outcome, is the quality of medical education or the relevance of medical education to future generic practice. Fortunately, the two outcomes are likely to overlap. The first may be a good indicator of the second.

POTENTIAL INCENTIVES TO CURRICULUM CHANGE

There are a number of incentives that have been used in attempts to motivate curriculum change

over the last several decades.

Societal Needs:

The last 50 years have shown that pressure based on societal needs is not a very good motivator of curriculum change (7,11,16,40,41). Still, this pressure may become a major issue, possibly resulting in political pressure, if the nation moves toward mandating access to health care through a universal insurance program. Medical schools will be expected to improve their response to the need for increased numbers of primary care and family physicians if this occurs (42).

Regarding the need to improve the specialty mix of graduates, the last three decades have shown that this is not a very powerful motivator of change. In spite of national predictions of unmet need for family practice and primary care physicians, and the call for medical schools to dramatically increase the number of graduates entering family practice and primary care, the standard curriculum has changed little (22). To quote Petersdorf, "To put it bluntly, we are not educating the kind of physicians most needed by our society. For some time, the message from the public and their elected representatives has been clear: more primary care physicians are needed, and the quicker, the better."(8) Instead, the percent of graduates entering family practice and primary care has decreased in the latter years of the 1980s (22,43).

Need To Improve The Educational Experience:

The last two decades at least have shown that this is not a very powerful motivator of curriculum change in most schools.

Accreditation Requirements:

These do have some ability to create change (44). These can mandate curriculum components, but do little to change faculty motivation and commitment, or the quality of curriculum experiences. A substantial change in accreditation philosophy would be to base accreditation not only on curriculum content and process issues, but outcome measures as well. Such a change might lead to an accreditation standard requiring a minimum percentage averaged over several years, possibly 40%, of graduates entering primary care practice for a school to remain accredited (or receive federal reimbursements).

Financial Incentives:

Educational financial supplements to clinical service reimbursement have the potential to be a positive inducer of change. The tailoring of Medicare participation in educational costs to specifically reimburse primary care housestaff programs, and to direct control of such funds to faculty rather than hospital administrative control may be feasible ways of encouraging shifts to ambulatory education (11, 21,23). A shift of housestaff educational focus to the ambulatory setting is likely to facilitate a concomitant shift in medical students (22).

Financial Penalties:

Financial penalties for not changing curriculum may need to be considered in the next several years if schools do not respond to other pressures. What will happen if Congress really loses patience with the medical education establishment, particularly if the current trend away from selection of primary care careers by graduates continues? One could envision a scenario where the Secretary for Health and Human Services is charged by Congress, or Congress decides to directly set a quota for the percent of medical school graduates that must enter primary care careers. A way of enforcing such a mandate would be to require that for every 1% short of the goal a medical school fell, its federal PHS indirect expense reimbursement component of federal grants and contracts would be decreased by 1%.

Figure 4 shows how one could track individuals entering their first year of residency training to get an annual estimate of a school's total percent of medical school graduates for the year ex-

pected to enter primary care practices. (See Kletke et al, (43) and Kohrman et al, (45) for a comparable model.) This would involve multiplying the percent of a school's graduates entering first year residency positions in each of the primary care fields by the national average of those who finish residencies three or four years later and start a primary care career. Adding these subtotals up yields a school's estimated percent of its current graduating class who can be projected to enter a primary care career.

For a class size of 100 and a $20 million federal indirect income, for each student by which a school fell short of its quota for primary care, the resultant penalty would be $200,000. For a school that had a $5 million indirect budget, each such student would cost $50,000. This magnitude of penalty, particularly if the shortfall were 10 or 20 students, is likely to capture trustees, deans, and department chairs' attention. It also would create a scenario where it was in the entire institution's interest to promote primary care careers, and for subspecialty faculty not tell students that they are too good for primary care, or otherwise dissuade them from primary care career choices.

Figure 4:

FEDERAL INDIRECT BUDGET INCENTIVE PROPOSAL

Major Elements

1. Congress Or The Secretary Of HHS Establishes Goal Of Number Of Medical School Graduates Entering Primary Care Careers Nationally
2. 1% Decrease In A School's Federal PHS Reimbursement Of Indirect Expenses Per 1% Shortfall In % Of The School's Graduates Entering Primary Care

Calculation Of Schools' Graduates Who Will Enter Primary Care Careers

Residency Specialty	% of Individual School Graduates Entering Primary Care		PGY-1 Positions	National Multiplier Of Specialty's Track Record Of PGY-1s Who Enter Primary Care		School Total
Internal Medicine General I.M.	X%	x		30 - 50%	=	____
Pediatrics	X%	x		?	=	____
Family Medicine	X%	x		92%	=	____
				Total	=	____

Possible Modifications

1. Cap of $2 Million In First Year, Increasing To $5 Million In Fifth Year
2. Phase In Of % Decrease In Indirect Reimbursement Of 1/4% A Year Until 1% Level Reached
3. Allow Bartering Of Primary Care Quotas Among Schools

Congress might want to modify this approach. It may not want to devastate schools at the onset of such a program, so it could place a cap at $2 million for the indirect reimbursement penalty the first year, and let that increase to a maximum of $5 million over five years. There are specific changes that schools could make in each year of a traditional four-year program that would progressively motivate graduates to enter primary care. Obviously, students in their final year could be exposed to more electives in the ambulatory curriculum during those few months before they must make their residency decisions. The many schools in the country who have yet to establish family medicine or other primary care clerkships in the third year could initiate them. Other programs could be initiated in the basic science years. The admissions process could be altered to select a large proportion of entering classes likely to go on to primary care careers. (28,42,46). Such changes would be expected to have a cumulative effect over the first years of the program.

A second modification to allow schools to barter their primary care quotas among themselves could be a component of such a national program, much as occurs among smokestack industries bartering emission quotas. This would provide "research" schools some flexibility in planning their future, while focusing their participation in a national response to the need for family practice and primary care physicians.

Such a program might generate a significant pool of federal penalty dollars, especially in its first years. To be revenue neutral, Congress would want to put these back into medical education. There are several ways to invest such dollars. They could support faculty development and improvement in ambulatory medical educa-

tion settings. A Hill-Burton analogous program could be created to fund the renovation of the national ambulatory infrastructure, including that of teaching community health centers, to provide settings for quality ambulatory teaching and clinical care. Congress could use the funds to support the development of innovative model family practice and primary care curriculum projects. They could increase the funds available for relevant tuition aid forgiveness programs. They could be invested in curriculum research, both at the medical school and residency level to explore curriculum effectiveness related to student outcomes.

POTENTIAL OTHER CONGRESSIONAL INITIATIVES

Congress could invest directly in some of these mechanisms. Tuition aid and forgiveness programs do work. The National Health Service Corps (NHSC) is a good example. It might be useful to modify the Corps to allow states to buy in. A state could share, for example, 25% of the cost of a NHSC position, if it were placed in that state. This would create incentives for state support that might become a multiplier of existing federal NHSC dollars.

The concept of the teaching community health center (CHC) program is one that has finally come of age, and the HRSA Bureau of Health Professions and Bureau of Health Care Delivery and Assistance are actively supporting experiments in this area. This has a powerful potential for addressing some of the country's needs. Our own experience with such a program at the Brown University Family Medicine Department is promising. Three years ago we increased our collaboration with two health centers, gave the health center physicians faculty appointments, jointly recruited board-certified family physicians competent in obstetrics, and placed our residents with them for ambulatory experience. For the last two years, over three-fourths of our 12 graduating third-year residents have gone to national manpower need areas, including rural need areas and federally funded health center positions. Such programs can be very effective in encouraging residency graduates toward careers in areas of major need. Our department is beginning to expose medical students to the same settings, although it is too early to see any results. Another approach that needs to be considered is to encourage expansion, not just status quo, but significant expansion of Section 780, 784, and 786 HRSA Division of Medicine training grant programs.

An innovative approach would be to develop a teaching community health centers program that would provide stable funding to federally funded CHCs and residencies demonstrating substantial commitment to training graduates for underserved areas. Such support should include funds for facilities renovation and staffing adequate to create a quality educational and service environment. As part of this program, a NHSC scholars track could be created. Such a track would provide NHSC primary care physicians four year appointments. Recipients would be expected to develop the skills to provide leadership in the development of teaching community health center programs and to be faculty at such CHCs. An intensive educational program such as that provided to the CDC Epidemiologic Intelligence Service and then ongoing faculty development support could provide a committed and competent national faculty.

CONCLUSION

The rationale for altering medical school curriculum to provide an emphasis on ambulatory experiences involve major curriculum principles and influences on student career choices. Most medical schools and affiliated hospitals have powerful institutional forces which hinder such curriculum alteration. To date, initiatives to accomplish such curriculum change have generally been at best, modestly effective. The associated goal of increasing the number of medical school graduates nationally who enter primary care careers has not been met. The components required to effectively promote such changes include alterations in faculty leadership and

priorities, changes in educationally related funding, and development of an ambulatory infrastructure capable of supporting quality education. A number of negative and positive incentives are available to promote such change. The increasing national demand for physicians responsive to the needs of the American public argue strongly for the adoption of new approaches to promote curriculum change.

Bibliography

1. Rosenblatt RA: Current successes in medical education beyond the bedside. J Gen Int Med 1988; (Mar/Apr supplement)3:S44-S61.
2. Association of American Medical Colleges: Study and Comparison of Transition of Medical Education Programs from Hospital Inpatient to Ambulatory Training Programs. Final Report. Contract No. HRSA 240-86-0068, October 1, 1986-November 20, 1987, Washington, DC.
3. Abbott AV, Lee PV: Medical student education in ambulatory care. Acad Med 1989; 64 (supplement)2:S9-S15.
4. Hayashi SA, Hayden BB, Yager J, Guze PA: Graduate medical education in ambulatory care. Acad Med 1989; 64(supplement)2:S16-S21.
5. Barker LR: Curriculum for ambulatory care training in medical residency: rationale, attitudes, and generic proficiencies. J Gen Intern Med 1990; 5(supplement):S3-S14.
6. Project Panel on the General Professional Education of the Physician and College Preparation for Medicine: Conclusion 4: Clinical Education. In, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 15-18, November, 1984.
7. Schroeder SA: Expanding the site of clinical education: moving beyond the hospital walls. J Gen Int Med 1988; 3:S5-S14.
8. Petersdorf RG: Three Easy Pieces. Acad Med, 73-77, February 1990.
9. Project Panel on the General Professional Education of the Physician and College Preparation for Medicine: Conclusion 1: Purposes of a General Professional Education. In, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 5-6, November, 1984.
10. Project Panel on the General Professional Education of the Physician and College Preparation for Medicine: Report of the Working Group on Essential Knowledge. In, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 109-124, November, 1984.
11. Perkoff GT: Teaching clinical medicine in the ambulatory setting. N Engl J Med 1986; 314:27-31.
12. Federman DD: The education of medical students: Sounds, alarums, and excursions. Acad Med, 65;4: 221-226, April, 1990.
13. Lee D, Nugent G: Costs associated with ambulatory care and education. Acad Med 1989; 64(supplement)2:S44-S50.
14. Tosteson DC: New pathways in general medical education. New Eng J Med 1990; 322:234-238.
15. Lurie N, Yergan J: Teaching residents to care for vulnerable populations in the outpatient setting. J Gen Intern Med 1990; 5(supplement):S27-S34.
16. Alpert JJ: Primary care: the future for pediatric education. Special Article in, Pediatrics, 86;5: 653-659, 1990.
17. Relman AS: What medical graduates need to know but don't learn in medical school. JABFP(special supplement), 3: 49-53, April-June 1990.
18. Kassler WI, Wartman SA, Silliman RA: Why medical students choose primary care careers. Acad Med, 66: 41-43, 1991.
19. Bennett WG, Delafield JP, Mishra SK, Tyler R: Quality assurance in ambulatory care. Acad Med, 64;10: S22-27, 1989.
20. Nardone DA, Webb DW: Administration in ambulatory care. Acad Med 1989; 64(supplement)2:S28-S34.
21. Eisenberg JM: Financing ambulatory care education in internal medicine. J Gen Intern Med 1990; 5(supplement):S70-S80.
22. Barnett PG, Midtling JE: Public policy and the supply of primary care physicians. JAMA, 262;20: 2864-2868, November 1989.
23. Ebert RH: Medical education for the twenty-first century. JABFP(supplement), 3: 7-14, April-June 1990.
24. Brucker PC: A chance for the generalist? JABFP(supplement), 3: 15-27, April-June 1990.
25. Robbins AS, Lussier RR, Koser K: A study of ambulatory care education in medical schools and U.S. Department of Veterans Affairs health care facilities. Acad Med 1989; 64(supplement)2:S1-S4.
26. Robbins AS, Guze PA (eds): Introduction to Proceedings from the Conference on Ambulatory Care and Education, July 1988, Los Angeles, California. Acad Med 1989; 64(supplement)2:Svii-Six.
27. Project Panel on the General Professional Education of the Physician and College Preparation for Medicine: Conclusion 5: Enhancing Faculty Involvement. In, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 19-22, November, 1984.
28. Petersdorf RG: If I were dean. JABFP(supplement), 3: 39-48, April-June 1990.
29. Irby DM, Ramsey PG, Gillmore GM, Schaad D: Characteristics of effective clinical teachers of ambulatory care medicine. Acad Med, 66: 54-55, 1991.
30. Halperin AK, Kaufman A: Ambulatory medical education: a reconsideration of sites and teachers. J Gen Intern Med 1990; 5(supplement):S35-S44.
31. Wilkerson L, Armstrong E, Lesky L: Faculty development for ambulatory teaching. J Gen Intern Med 1990; 5(supplement):S44-S53.
32. Greer DS: Faculty rewards for the generalist clinician-teacher. J Gen Intern Med 1990; 5(supplement):S53-S58.
33. Perspectives on faculty. In, Emerging Perspectives on the General Professional Education of the Physicians. Reprinted in Part 2, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 73, November, 1984.
34. Perspectives on clinical education. In, Emerging Perspectives on the General Professional Education of the Physicians. Reprinted in Part 2, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 64, November, 1984.
35. Branch WT: Teaching models in an ambulatory training program. J Gen Intern Med 1990; 5(supplement):S15-S26.
36. Wartman SA, O'Sullivan PS, Cyr MG: The service/education conflict in residency programs: a model for resolution. J Gen Intern Med 1990; (supplement):S59-S69.
37. Chapman DD, Hodgman JE, Johnson RL, Matlin NM: Replacing the work of pediatric residents: strategies and issues. Commentary in, Pediatrics, 85;6: 1109-1111, June 1990.
38. Honigfield L, Perloff J, Barzansky B: Replacing the work of pediatric residents: strategies and issues. Pediatrics, 85;6: 969-976, 1990.
39. Project Panel on the General Professional Education of the Physician and College Preparation for Medicine: Conclusion 5: Enhancing Faculty Involvement. In, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 19-22, November, 1984.
40. Schwartz WB, Sloan FA, Mendelson DN: Why there will be little or no physician surplus between now and the year 2000. N Engl J Med 1988; 318:892-897.
41. Dacso CC: Factors influencing ambulatory care education in the U.S. Department of Veterans Affairs. Acad Med 1989; 64(supplement)2:S4-S8.
42. Clawson DK: The education of the physician. Acad Med, 65: 84-88, 1990.
43. Kletke PR, Schleiter MK, Tarlov AR: Changes in the supply of internists: the internal medicine population from 1978 to 1998. Ann Int Med 1987; 107:93-100.
44. Other important considerations. In, Emerging Perspectives on the General Professional Education of the Physician. Reprinted in Part 2, Journal of Medical Education, (Special Issue: Physicians for the Twenty-First Century), 59;11: 2, November, 1984.
45. Kohrman CH, Lyttle CS, Andersen RM, Levey GS: National study of internal medicine manpower. XIV: Patterns of residency and fellowship over time, 1987 update. Arch Intern Med 149: 2179-2185, 1989.
46. Rabinowitz HK: Evaluation of a selective medical school admissions policy to increase the number of family physicians in rural and underserved areas. New Eng J Med 1988; 319:480-486.

Christine McGuire
Professor Emerita
Department of Medical Education
College of Medicine
University of Illinois

Respondent

I would not presume to try to summarize the rich variety of theory, data, concepts and principles presented by the panel; rather I shall try to highlight a few of the items in that vast array which are particularly relevant in developing a set of recommendations to be made to the Secretary and to Congress. However, since there are many players in this game I would also urge the council not to limit its deliberations to modifications in the role of the federal government, but also to consider possible revisions in the policies and practices of accrediting agencies and medical schools that would serve our national objectives.

In reflecting on what needs to be done I shall employ Dr. Rabinowitz's analogy of the "black box," organizing my remarks around the topics of the input, content and output of that box as represented by our medical schools and as discussed by Dr. Rabinowitz, Drs. Small and Culpepper, and Dr. Swanson.

Output

It may seem strange to use the product of our medical schools as the starting point; however, I would argue that any discrepancy between the desired and the actual characteristics of our graduates alerts us to the existence of problems. What have we learned from the panel that helps us to focus on these problems?

First, it is clear that the pattern of career choice among our graduates (which has remained remarkably stable over the past decade) is not in accord with national needs with respect to geographic and specialty distribution. Second, students rarely mention the nature and quality of their educational experiences as having had any significant effect on their career decisions; rather they report that they were most influenced by the inherent characteristics of the stimuli in different specialties and varied settings, i.e., by the relative "intellectual challenge" of the several disciplines, the kinds of patients seen, the effects of different therapies and the like. If true, these observations are exceedingly disconcerting because they seem to imply that there is very little that the educational establishment can do to bring about a greater congruence between its output and national health manpower needs.

However, there are two additional findings which suggest an alternative hypothesis: First, there is evidence that within a given institution students enter a particular specialty or sub-specialty in unusually high numbers during the tenure of an especially charismatic clinician who evinces an obvious interest in teaching (vide the data on the number of students entering orthopedic surgery at the University of Washington during the period of Dr. Kay Clawson's chairmanship). Second, there are substantial and persistent differences among institutions with respect to the patterns of career choice among their graduates.

Recommendation: In light of these data it seems reasonable to urge that an epidemiological and/or anthropological type study of medical schools be undertaken to identify institutional characteristics and policies associated with the desired pattern of career choice among graduates, so that others may emulate these conditions.

Input

The data provided by Drs. Swanson and Rabinowitz make it very clear that what is put into the "black box" will be a heavy determinant of what comes out. In order to shape that output appropriately we need large scale, systematic demographic studies of the relation between

student characteristics and career choices, as a guide to developing what has euphemistically been called "preferential admissions policies" that will be more likely to produce the kinds of physicians required to meet health manpower needs.

Content

As Drs. Small and Culpepper have so eloquently reminded us, consideration of the content of the black box must include a review of curricular organization and instructional techniques, evaluation methodologies and alternative settings for learning.

Curriculum and Instruction: While the disciplinary organization of knowledge has clearly facilitated research, it is doubtful that such a structure is maximally effective in transmitting that knowledge to new generations of students. Indeed, research at elementary and secondary school levels has taught us that, in general, people acquire more information, retain it longer, understand it better, and are able to apply it more effectively if it has been learned in a functional context. The question remains, however, as to whether that finding also applies to adult learning in advanced, specialized areas. While we do have some evidence from studies in medical schools which suggest that students who learn in a problem-based, student-centered program are more enthusiastic, more motivated, perhaps even more self-directed (at least according to their own self report), we do not yet know whether they actually perform better than students from traditional programs in delivering health care. A study of such outcomes would be exceedingly helpful in guiding decisions about curricular structure and instructional techniques.

Student Evaluation: In his discussion of assessment methodology, Dr. Small has challenged us to consider two major issues: (1) the sources of data about student competence and (2) the standards to be applied in determining "readiness to practice."

With respect to the first, he questions our heavy reliance on faculty and on external regulatory agencies as the primary sources of information and urges that students also be involved in evaluating themselves and each other. He recommends that self and peer evaluation be a part, not only of evaluation for diagnostic and counseling purposes, but also in the assessment of competence to practice. Indeed he proposes that final certification for graduation and licensure be based on equal parts of self, peer, faculty and state evaluation.

Two questions need to be addressed in considering this proposal: (1) what kinds of data are students able to provide reliably and validly about themselves and each other? (2) How is their motivation to provide accurate data altered by the uses made of the data? In answer to the first question the evidence suggests that students are probably not able to rank themselves and each other reliably with respect to some vague criterion of overall competence or "readiness to practice;" however, they can provide accurate and useful data in response to specific questions such as: "Which of your colleagues would you prefer to have assist you in an emergency?" "To whom would you prefer to refer a loved one with a chronic illness?" However, in considering the authenticity of self and peer evaluations by students it would seem prudent to recognize that, like the rest of us, they are probably not a reliable source of data in those circumstances where the information they provide is to be used to make critical decisions that affect the informant's own career and/or that of his or her friends.

With respect to issues regarding the methodology for setting standards of competence, Dr. Small joins a growing consensus urging the National Board of Medical Examiners and other certifying bodies to provide only those data about individual performance that they can certify as valid. For example, he suggests that they limit their feedback to schools and other interested parties to a simple "pass/fail" report and that they no longer provide data for ranking candidates on the basis of miniscule differences

that are of no practical significance. I, personally, would further recommend that these agencies be pressed to re-examine the kind of standards they now employ in making any "pass/fail" decision and that they consider abandoning normative standards by which it is arbitrarily decreed that x percent of candidates will fail no matter how qualified they may be while 100% -x will be certified irrespective of any lack of competence they may have demonstrated. Rather, along with many others, I urge that all "pass/fail" decisions about certification and licensure be based on "absolute standards" as defined by the requisites of practice;* determination of the requisites for practice is itself a research issue and one whose resolution would be greatly facilitated by government support of relevant investigations.

Setting for Learning: Both instruction and evaluation take place in a variety of settings whose relative contributions to educational effectiveness are now beginning to be examined. Dr. Culpepper has made a convincing case for the importance of the ambulatory setting in providing opportunities for learning not available in the typical tertiary care setting; he has also made it abundantly clear that realization of the full potential of the ambulatory care setting requires dedicated leadership, serious planning and adequate personnel and financial resources.

Data from studies of general education which suggest that people perform more effectively when they are managing familiar problems that present in accustomed settings appear to support the claims that special values can be derived from learning in an ambulatory care center. Certainly, they argue for supplementing traditional hospital experience with a large component of community-based education. Research on the efficacy of instruction in such settings is, as yet, inconclusive; however, findings from several studies (including a particularly interesting one carried out in Norway) agree that, as compared with students from traditional programs, students with extensive community-based experience feel more comfortable with typical health problems the population presents; feel more assured about their ability to handle those problems, and feel more confident about their preparation as provided by their medical school; whether students from community-based medical schools actually are more competent in handling those problems has not yet been established. Given the costs of medical education in any setting the urgency of documenting its relative effectiveness in varying circumstances becomes apparent.

Program Integration: Institutional policies and practices with respect to admission, curricular organization, instructional techniques and evaluation methodology may be chosen and implemented so as to interact synergistically to enhance the institutional product. As vividly illustrated by the experience reported at Jefferson College of Medicine, it was possible through judicious selection of curriculum, of instructional setting and of mentors to reinforce the specific initial career preferences of students that Jefferson was seeking to encourage.

Recommendation: To enhance rational policy decisions by institutions the Council may wish to urge the government to support the creation and analysis of a large data base regarding the relation between educational practices and educational outcomes that will help to answer the question "What Works?", -- an initiative analogous to that of the Office of Education in its publication of the same name for elementary and secondary schools.

Role of the Government

Throughout this discussion it has been repeatedly implied that, subject to nationally established goals and standards, it is the responsibility of individual institutions to determine educational policies and to implement practices in accord with institutional objectives. The government can assure that these institutional choices are most effective and efficient by furnishing assistance in the form of financial support and special expertise for three types of initiatives: (1) for data collection and develop-

ment of an adequate data base to assist institutions in making informed decisions; (2) for stimulating various educational innovations and evaluating the efficacy of each; and (3) for providing incentives that will reshape the educational enterprise better to serve national objectives.

It is (a) constructively disquieting to admit that the fundamental issues of medical education today are similar to those that my husband, Jules, tells me medical schools and examining bodies were concerned with two generations ago; however, (b) it is also heartening that we are dealing with these issues with accumulated experience and wisdom. Perhaps some of the newer techniques of evaluation, such as the more inclusive applications of meta-analysis will help us interpret and integrate the currently protean studies in our field.

* For example, in making "pass/fail" decisions for a driver's license the authorities do not automatically fail those who score in the lower 10% of applicants or those whose score is one or more standard deviations below the mean; rather, they set "absolute standards" based on each candidate's knowledge of the rules and regulations, his or her response to various situations on the road, individual skill in parking and the like.

Daniel M. Fox, Ph.D.
President
Milbank Memorial Fund

Respondent

Thank you. Like Professor McGuire, I won't presume a need to summarize the eloquent and wise statements that were made yesterday. I do, though, want to try to persuade you that there was, what people in another discipline call a "sub-text" in all of the remarks. And that sub-text, which is the theme of my talk, is that medical education is health policy.

I have been in medical education for 20 years, and I do not rely on single methods of teaching. I rely also on enraging the audience which is what I am about to do, because just as most of you have spent your life in medicine, I have spent my life in policy. So I see what I want to see. Unlike people who have been trained properly in science.

I spent my career making policy, implementing it, doing research on it, and writing on it. I am no stranger to doing any of those things in medical education. I take enormous pride in having spent some years of my life helping to turn a potato field into an academic health center and never asking questions about whether the farmers produced more good for society than we did. We were, after all, the largest SMSA, Standard Metropolitan Statistical Area, in the United States not served by an academic health center. Stony Brook, Long Island, had been a medical colony of the Manhattan teaching hospitals, which, as you know, have 13 beds per 1,000 population, or did.

I am no stranger to talking about medical education as health policy to audiences like this and being ignored. Dr. Swanson will remember a project that he and I were a part of a decade ago that resulted in a paper published in what was then called The Journal of Medical Education. It was even the first paper in that issue of the journal, so that the browsers could not miss it. It said that we know damn little about three questions. What is the relationship between professional practice and health status? Second, what is the relationship between education and professional practice? And third, what is the relationship between education and students' behavior and values? It said it matters that we don't know about this, because, after all, people are making policy all the time that assumes such knowledge, and what if the people who are financing medical education ever found out that we don't know? Well, the paper, having survived peer review, having appeared in the JME, had the usual effect of papers that make that statement.

Medical education is health policy. I want to remind you what our society entrusts to medical education. It entrusts to the schools and the teaching hospitals a principle responsibility for new knowledge, for disseminating it, and for vastly important areas of patient care, for regions, states, and the nation. In case anybody is interested in the long view, we have done this as a matter of health policy in the United States since the second decade of the 20th Century. It is not new.

Because medical education is health policy, it is funded by both the higher education and the health care budget. Any of you here who have done business and done combat as deans or who have done combat as vice presidents for health affairs, knows that unlike your other colleagues in the university, you are working both the health care and the higher education parts of your state government on the executive and the legislative side.

Medical educators desire autonomy. But that autonomy is compromised by a number of things that we live with all the time. One is the policy pressures to regulate practice and practitioner according to some standard of the public interest. Second, is the policy pressure to restrain the costs of a large policy commitment, the cost to government, and the cost to our employer pay-

ers who, together, as we well know, in this country account for 100 percent of the costs of health care. Oh, a little bit out of pocket. But out of pocket, has never issued a regulation.

Now, the schools and the teaching hospitals are also, as we well know, regional economic players. They're large employers, and they contribute an enormous amount to the regional economy. In some places they are the largest employer in the region or in the metropolitan area. Their contributions to the economy create enormous and important policy connections. I made the argument in New York State that when you applied economic logic and used the multiplier concept, the leakage, which is a term for money that's returned to government in taxes having been spent and the dollar turns around, the medical center costs the taxpayers five cents on the appropriated dollar. And that was a better bargain than you got in roads, in welfare, in keeping farmers on the land.

My point--that medical education is health policy--becomes clearer when medicine is compared to other kinds of higher education. We don't ask our engineering faculties to build the bridges or to manufacture consumer electronics better and more cheaply than the Japanese, the Taiwanese, or the Koreans. We don't ask our law professors to staff and manage the courts or even to run the legal services corporations. Some law schools have clinical practices, but that's really regarded as marginal. We don't ask our educational schools to manage school systems except the one that was managed as part of the gubernatorial campaign on the democratic side in the Commonwealth of Massachusetts. We don't ask our business schools, which are full of great advice for all of us, to manage model companies or to demonstrate new ways to make money in S&Ls. We don't ask our divinity schools to cure souls or even to provide the staff for churches for the poor.

So what we're talking about when I say that medical education is health policy is something that is unique in our society to medical education. The only comparison that can be made is agricultural policy, and those of you like me who have done time in rural states, know how powerful the Farm Bureau and the Extension Service are in the links with the university through cooperative extension, etc., etc. Agriculture is the only parallel, and if I had more time, I would tell you that it is a very instructive parallel. Instructive in ways that are obvious, but also instructive in ways that were recommended by Senator Burton Wheeler who, some of you may remember, was a great Mid-Western Senator of the 1930s. Senator Wheeler once said that the way you cure the problem of agricultural surplus, is to plow under every third farmer. I would not presume to tell the Council on Graduate Medical Education to learn something from Senator Wheeler.

Why is medical education health policy in the United States? I think the explanation is complicated. The explanation is fascinating. Let me quickly, and oversimply tell you why. If you're really interested, I'll send you a bunch of reprints.

I think medical education is health policy in the Unites States, because of our failure to achieve consensus on the universal financing of demand for health care. That's a carefully worded sentence. The premise, which I think I can defend and I've tried to defend the last few years, is that medical education is health policy in the United States in ways that medical education is not health policy in other countries. Not all other countries. Some other countries. And in particular, the healthier and more prosperous countries of the European Community.

Medical education is health policy because we haven't achieved consensus on universal financing of demand. You notice I didn't say government, national health insurance, financing. I said universal financing of demand, because what the countries in the European Community have in common is not, mythology aside, socialized medicine, not government financing, but universal financing of the demand for health care.

In Britain, it's a 100 percent tax supported system. In most of the countries of the European Community it is partially tax, partially payroll, partially co-pay. In Sweden, it's even more complicated. I've been doing research in Hungary recently, and I must tell you that it has all of the problems of fee for service and capitated medical care practiced by the same doctors on the same patients in the same settings; unregulated fee for service. So much for socialist models.

I am talking about our failure to achieve consensus on universal financing, that means everybody participating in, financing demand. And when I say failure to achieve consensus, I am talking about a lot of American political history. I am saying that we have tried, and the best we could come up with, to date, is what I called elsewhere, the compromise of the 1960s, in which we have universal financing of demand for persons over the age of 65 and persons who are totally disabled, according to federal criteria we have employment-based financing of demand for those who are employed, and we have public charity for the remainder.

What are the consequences? For 50 years we have used supply side policies as substitutes for a universal demand policy. As the ranking Republican member of the Senate Health Appropriations Committee said in 1960, "The NIH is our national health insurance." Unlike any other country in the world, when we couldn't get consensus on the demand side, we poured billions of dollars into the research side, into hospital construction through the Hill Burton program, and through state and federal medical education subsidies. And those of you who have grown up in state universities, will know that the states contributed much more than the Federal Government ever has to the construction and organization and base budgets of medical schools. The politics behind most of that state investment, was done before Medicare and Medicaid.

By 1955, the states had bonded 10 billion dollars for construction of medical schools in a decade. For 50 years, medical schools were what our society used for the supply side, when we could not fix demand. Did the medical faculties like that? You better believe that the medical faculties liked that.

I am here to tell you that it was only after the clear failure to achieve consensus around the demand issues in the late 1930s, that the elite of American medical education said, "Demand and health care finance? That is none of our business." If you read the medical press, if you read the New England Journal of Medicine up through 1938 and 1939, you will find all of the great men and the few great women of American medical education endorsing a universal demand strategy as well as the research, medical education, and the school building strategies.

Medical educators are smart, and like all good political actors, they knew when to leave a ship that was not going to go out of the harbor. They didn't help the ship go out of the harbor, but they left it. Now, as a consequence of the demand problem, medical schools and teaching hospitals became residual providers for the poor. From 1965 on, there has been an enormous increase in the dollars for those residual provisions. An enormous increase. Much of it brought about by the successful political action of medical educators. When you look at the political history of Medicare and Medicaid, you will discover that the medical educators were quietly, sometimes not so quietly, present. There was no real chance that the American medical profession would boycott Medicare.

When the AMA, if you recall, threatened a medical boycott, Jim Apple, President of the AMA, called it off before Medicare began. He realized that the academics weren't going to go along with it. So that when the academics became players in a piece of a universal demand strategy, we changed the financing and we changed the rules of a large piece of medical education.

The next consequence of the failure to get consensus on universal financing and demand is the

inability of both the demand side as we structured it, and medical education to respond coherently to the pressures of chronic illness in our society. We have backed into financing management of care. We have backed into financing long-term care. We have done it incrementally. I recently published a paper showing how insurance contracts have grudgingly changed over the last 40 years. But we have backed into it.

We backed into it because, unless you solve the universalizing of demand problem, you cannot do for everybody who has a chronic disease what we do for the elderly who have chronic disease, spread the cost over everybody who works in the society. Europeans give us eight or nine different models for doing it.

Unless you do that, you don't manage chronic disease, you can only manage episodes of chronic disease which resemble the acute episodes that you knew how to handle in an earlier demand structure when fee for service was adequate because the fees were low, and the demand for services was less.

Now for my attempt to distort what you said into policy issues. Let me start with Professor McGuire. Reworking your remarks as a policy issue, I heard: What consensus about the goals of American health policy should the curriculum embody? And then, with that consensus what should medical educators do about information, curriculum, organization, teaching sites, instructional methods and assessment methods? But I want to put the policy question as the driving force behind all of the boxes, black and other, if you will permit me.

Dr. Rogers asked a revolutionary policy question. People that famous, that distinguished, that accomplished, aren't usually revolutionary. So if David were here, he would be grinning. And wishing I hadn't said it. Can we rearrange the balance of power between medical faculties and external bodies to produce doctors who love learning, reason better, care more, and are socially aware? Can we rearrange the balance of power? Can we create a social revolution? And, David Rogers told us, that rearrangement would result in lower financial reward for the faculty, a drastic change in the government of the medical school, medical school responsibilities for graduate medical education, and more training in ambulatory settings. Wow.

Dr. Cluff was slightly less radical, but challenging in a very important policy dimension. What policy goals are served by reorganizing the relative power of the interest groups within medical education itself? Not for the first time, Rogers is Mr. Outside, and Cluff, is Mr. Inside. Dr. Rogers wants to rearrange the power balance between the faculty and the external groups and Dr. Cluff just simply says, "Let's mix up how the basic scientists and the clinical faculty relate to each other, how all of them relate to the chairs, and how the chairs relate to the deans." He's asking an interesting tactical question. Can a foundation, once more, help leverage change in medical education? Those of you with long memories will recall that the Carnegie Foundation and the Rockefeller Foundation, were into this game in the second decade of this century.

Dr. Kettel was asking a profound policy question. What changes in health care financing and supply side incentives will stimulate changes in the curriculum and methods of medical education? He was careful not to address how one might go about making those changes, but he was pointing out that you can't have one without the other.

Dr. Swanson then gave us an interesting challenge. If medical education cannot have a significant influence on the career choices of students, are there any policies that can? Surely we want to influence career choice, but let's think about the policies that can, rather than keep returning to medical education and say, "Do it, damn the data."

Dr. Rabinowitz continued in the same area of the policy forest, asking a question which I

converted into a somewhat different policy question. Are there policies that will produce more primary care physicians without discriminating in favor of students who are rural, older, married, have lower GPAs and MCATs, etc.? That is to say, in order to discriminate for these students, we will be obliged to discriminate against people who have other qualities which contribute to medical care. Who, incidentally, could also hire lawyers, sue, write to their legislators. I think that's a fascinating policy question.

Continuing to Dr. Small. Dr. Small's policy questions were really central to what we're up to. How should the medical curriculum be evaluated in the public interest? If medical education, as I've been saying throughout this talk, is health policy, then what we're talking about is not the methodology of a bunch of teachers in relation to their students, we're talking about regulation in the public interest.

What Dr. Small called state evaluation, I want to call by it's proper name in the political community, interest group self-regulation. The Board of Medical Examiners, and state examining boards, have not noticeably been run by the electorate at any point in their history. We are talking about changing the pattern. This is as revolutionary in many ways as what Drs. Cluff and Rogers were up to. Probably, more revolutionary than your subordinate questions about the public interest.

Dr. Culpepper brings us around again, as, I think, Professor McGuire recognized in her comment on his paper, to the very question that was the basis for his presentation. How should education prepare students to practice? A subordinate question, what is the appropriate type of policy to support education for those missions? And Dr. Culpepper offered us the kind of solution that happens when an interest group allows itself to be perceived as an industry. Because your solution simply says, tax the proceeds of the medical education industry, it doesn't matter where they came from, whether it is the overhead costs or whatever. You are putting a tax on the industry. Are there other approaches? Well, I think you hear me saying that if we can figure out how to get a consensus on financing universal demand for care, we will be a long way towards taking some of the policy burdens off of medical education and allowing us to teach the students.

What does all of this add up to? All change is difficult. But change is much more difficult when we don't acknowledge the policy stakes and, therefore, are crippled in doing the politics. Saying, as I have been for the past 20 some minutes, that the stakes in medical education are the stakes of health policy won't, of course, make any changes. But, and here is my simple point, it will help us describe the players, assess the issues, and perhaps relate issues and players more constructively and ultimately more measurably.

MEDICAL

EDUCATION IN THE

AMBULATORY SETTING

September 26, 1990

MEDICAL EDUCATION IN THE AMBULATORY SETTING

September 26, 1990

Dona L. Harris, Ph.D.
Scholar in Residence

INTRODUCTION

I would like to offer a sincere welcome to members of the subcommittee, guest speakers, and our audience. The Medical Education Programs and Financing Subcommittee is one of three committees of the Council on Graduate Medical Education. The remaining two are Physician Manpower and Underrepresented Minorities in Medicine.

One area at the core of all three subcommittee's deliberations has been the erosion of the medical professional pipeline with particular concern for primary care career selection. At our last meeting we introduced the topic of REFORM IN MEDICAL EDUCATION, and reviewed the global issues facing us. That meeting was an introduction to what we will be covering today and potentially include in a third report to Congress: Medical Education in the Ambulatory Setting.

Before turning the agenda over to the experts in ambulatory training, I would like to review some of COGME's earlier conclusions and recommendations, and hopefully set the stage for our deliberations.

COGME's first report to Congress in 1988 made the following conclusions and recommendations:

CONCLUSION B-1. There is a geographic maldistribution of physicians, with too few physicians in many rural and inner-city areas.

RECOMMENDATION 4. Existing activities that increase the likelihood that physicians will locate and remain in shortage areas should be continued and strengthened such as:

a. Recruitment and selection of medical students who are likely to locate in shortage areas;

b. Medical school programs including preceptorships in shortage areas.

CONCLUSION D-1. There is evidence of an undersupply of primary care physicians.

RECOMMENDATION 12. Medical school graduates should be strongly encouraged to enter training in primary care, particularly in family practice and general internal medicine.

What has happened since those recommendations were made to Congress?

Data from recent reports prepared by the Bureau of Health Professions, the Division of Medicine, and in the August issue of JAMA show:

1. During the 1980's primary care physician supply comprised about 30 percent of all physicians, showing a slight decline.

2. State governors in 48 (87%) states and territories reported general shortages of primary care physicians.

3. There is a continued decline in interest in primary care careers by U.S. medical school graduates.

4. Of the 125 fully accredited U. S. medical schools and the one accredited 2-year school in Duluth, Minnesota:

    a. 32 (26%) had one or more geographically separate campus defined as geographically remote but under the central governance

of the medical school. I am assuming this means 1/4 had opportunities for training in underserved areas as an integral part of their curriculum.

b. 67 (54%) have a clerkship in Family Medicine averaging 5.3 weeks; an actual decline of 2 from last year; Oral Roberts because it closed, plus one other.

However, we know what works:

1. 30% of family practice residency graduates practice in non-metropolitan areas whereas 11% of other specialists do.

2. Students and residents exposed to underserved populations through preceptorships and clerkships in their training are the ones who end up practicing in such communities.

3. Graduates of tracks in primary care internal medicine and primary care pediatrics are more likely to provide care to underserved populations.

4. An analysis of the federally funded predoctoral training programs in family medicine, those programs considered "feeder" schools, i.e., 15% of the graduates pursue residencies in family practice, 62% required a family practice clerkship and 78% received continuous federal support for 5 or more years.

CONCLUSION: There continues to be a critical need for students to be exposed to primary care experiences in the ambulatory setting if they are to even know what primary care is about, let alone practice primary care and then serve the underserved. Only about 50% of our schools offer that opportunity.

As a note of interest, the Division of Medicine had two COSTEP students working on projects with the division during their summer away from their medical studies. One of the students wanted to know the attitudes and knowledge of her classmates at Howard University about careers in primary care. She sampled her class, and although it was a very small return, there was a disappointing knowledge about primary care. Members of her second year class listed as primary care:

Anesthesiology	(2%)
Dermatology	(2%)
Psychiatry	(17%)
Surgery	(3%)
Family Practice	(92%)
Internal Medicine	(79%)
Pediatrics	(83%)
Obstetrics/Gynecology	(62%)

Facing the problems of severe primary care shortages especially in the rural and inner-city areas, we have yet another Presidential budget that provides no funding for the 1991 primary care training grants and supports $7.9 billion for the National Institutes of Health. Even if funding continued at the same level, it is a decline in real dollars over time.

I would like to challenge the subcommittee to look at medical education in the ambulatory setting with the survival of primary care on the line. We have the talent in this room to uncover those key factors that lead to successfully implemented ambulatory primary care training in academic settings in the face of the current fiscal hurdles.

As in the last meeting I would like to encourage the participants to be interactive. The agenda allows for opportunities for discussion, and I hope none of us misses those opportunities.

W. Douglas Skelton, M.D.
Provost for Medical Affairs and Dean
School of Medicine
Mercer University

QUALITY PREDOCTORAL TRAINING IN THE AMBULATORY SETTING

Quality in medical education is not easy for me to define. Hopefully, it differs from the "quality" and "excellence" which characteristically are used to describe most proprietary health care services. I've been more enamored of such words as adequate or useful, particularly if they are backed by data. Nonetheless, it is clear, I believe, that our personal assessment of an educational experience as having quality depends to some degree on values or beliefs we hold about the goal of medical education.

I describe the goal of medical education as the production of caring and competent physicians who are committed to independent and life-long learning. Caring means valuing people, empathizing, feeling and demonstrating compassion and personal sensitivity. Competent means a certain level of understanding of biological, psychological, and social influences on human behavior in health and illness. A competent physician will have an understanding of the difference between a profession and a business, including the social role and responsibilities of physicians, and will value and practice independent learning.

The great teaching hospitals have made major contributions to medical education. They will continue to do so even as they become less suited for many aspects of clinical education. As medical care continues to move out of the hospital, medical educators have found it difficult to structure an integrated and coherent learning situation which allows a student to follow a problem from identification to outcome.

Practicing physicians report themselves as unprepared for ambulatory practice. The inpatient focus has limited our students' recognition that most illness is chronic illness which is best treated and learned about over time in an ambulatory setting. Decision theory, clinical epidemiology, communication skills, and ethics are among the issues promoted for the ambulatory setting. Frankly, they are issues for any setting where patient encounters occur. Certainly, an ambulatory setting is a better site for examining the cost and benefits of the increasing intensity of medical services than the hospital where many forces encourage the use of high intensity care.

The need for greater exposure of medical students to ambulatory care has been included in several recommendations for change in medical education. The GPEP Report[1] and the Macy Foundation Report on Clinical Education and the Doctor of Tomorrow[2] are noteworthy examples. Moore[3], in the latter report, called for the development and dissemination of a two-month primary care/general medicine curriculum emphasizing the acquisition of basic competencies necessary to the effective practice of office medicine (ambulatory care in all specialties. This same belief or view was important in the deliberations of the Society of Teachers of Family Medicine work group which developed Curricular Guidelines for a Third-Year Family Medicine Clerkship.

Teaching in the ambulatory setting has not been very popular in the past. It has been characterized as dealing with trivial problems (the worried well), expensive, unacceptable to patients, and poor preparation for residency. Unfortunately, and principally for lack of all the things needed to have a successful program, many ambulatory care programs operated with little or no orientation of the student and few instructional experiences designed to meet specific educational goals. Feltovich et al[5] made the point clearly. "Exposing students to ambulatory care is not the same as educating them in ambulatory settings."

An effort was made in the 1950's to improve

education in ambulatory care settings. Several schools developed comprehensive medical care programs which were well received by students and were as effective educationally as traditional programs. Perkoff[6] ascribed their failure to lack of departmental ownership, i.e., the clinical faculty were "on loan" from other departments, and there was a gradual loss of faculty to the lure of biomedical research dollars and specialty practice dollars.

Quality / adequate / good / useful / efficient education in the ambulatory care setting must be designed to meet specific educational goals. Outcomes must be defined and evaluated. The program design, i.e., timing in the curriculum, length of the experience, number and mix of faculty resources, etc., differs for goals as diverse as introductory history taking and continuity of care. Remember the "Q" in quality. Question everything. Why are we doing this? What do we expect the student to learn? How is progress to be assessed? What attitudes may develop? What values might be reinforced or challenged?

Woolliscroft and Schwenk[7] stress the need to recognize that ambulatory care settings are organized more for the convenience of the patient (or they should be) and that the patients are more independent. They have non-patient identities, jobs, deadlines which they have not set aside to assume a passive, patient role. The educational experiences must be designed with these differences in mind.

There is a broad range of teaching and learning goals possible in ambulatory settings, whether in primary care or specialty medicine. There can be greater exposure to undifferentiated problems, to highly differentiated problems not often seen in hospitals, to the natural or treated history of an illness, to clinical epidemiology, to decision analysis, to the development of communication skills.

These goals and many others which are best pursued in ambulatory settings are critical to developing future physicians to meet patients' needs in the evolving health care system. To assure quality in the ambulatory care educational experience requires attention to the important aspects of all education experiences. These are identified goals, appropriate instructional methods, reliable evaluation systems, and a feedback system for correction or change. These things are not simple. Assessment is a complex area and instructional methods, e.g., reading lists, patient contact, use of simulated patients, computer assisted learning, need constant attention.

But quality education in the ambulatory setting requires other things to be successful.

1) The commitment of senior leadership. Students gear what they study to how they are evaluated. Institutions respond to the values of their leaders. There must be a willingness of leadership to articulate the value of education in the ambulatory setting, advocate for it, support it with resources, and protect it from enemies.

2) Curriculum change may be necessary. A few schools, my own included, have developed with specific missions to produce primary care physicians. Most have recognized that beginning medical students are not yet biased against ambulatory care or primary care. The curricular response is to focus on ambulatory care early with exposures to patients in community settings and efforts to learn population-based approaches to community care. The goal is to support and to encourage primary care choices. The content is substantial and important. Not stated, but important, is the message that the sciences basic to medicine are biological, behavioral, sociological, psychological, epidemiological, i.e., that knowledge, opportunity, and intellectual challenge exist in ambulatory care as well as in high technology, hospital intensive settings and specialties.

This message has to be continued with quality

ambulatory care components in the third year core or required clerkships. Psychiatry, dermatology, and other principally outpatient specialties have in many schools developed very good programs. Some of these experiences have been reported. Gutmann[8] describes a 20 year neurology experience at West Virginia University which was begun due to the lack of neurology residents. His comments on the advantages of such a program can be extended to other subspecialties. The advantages for education are the larger number and variety of illnesses and more experience with the course of serious disorders. After 20 years he concluded the experience is best when only students and faculty are involved. Residents were reported not clear on how much to delegate.

Now, from my experience to date I believe family medicine is the model for quality ambulatory care at the predoctoral level. I'm sure there are good programs in the other primary care disciplines, i.e., general internal medicine and general pediatrics. However, Feltovich's[5] review was not very encouraging as regards internal medicine, and both general internal medicine and general pediatrics are struggling for support within their parent specialty. Under the best of circumstances ambulatory care experiences in internal medicine and pediatrics, and other specialties, cannot substitute for a six to eight week ambulatory care experience in family medicine, especially if the program is developed with the goals and core competencies described in the Society of Teachers of Family Medicine's Curricular Guidelines for a Third-Year Family Medicine Clerkship.[4] Unfortunately, only about 50 of the 126 medical schools have required family medicine clerkships in the third year.

For many schools, attention to the faculty reward system will be necessary. Promotion of faculty involved in ambulatory care has been a problem. Kosecoff et al[9] noted that fewer than 25 percent of faculty in the General Medicine Group Practice Program funded by the Robert Wood Johnson Foundation reported two or more publications a year. At Mercer we have a teacher-clinician track which requires scholarly activity but not publications.

I believe some of the problem is value oriented. Innovation and creativity are needed in developing programs in the ambulatory setting. Professional and economic rewards need to follow such activities. It needs to be pointed out, however, that educational innovations, from design to evaluation, need to be in the literature. There is little excuse for not writing about these things.

Residents have always been viewed as important in the education of medical students. A "ladder of learning" is described as progressing from faculty to resident to student. Despite vocal proponents, there are no data linking resident involvement in teaching to improved medical student learning. In fact, when those of us who don't have residency programs in all the disciplines compare student performance between clerkships with or without resident involvement, no differences are noted.

On the contrary, there is evidence that the piggy-backing of medical student education onto graduate medical education may be serving U.S. medical education poorly. Schwarz et al[10] in a 1990 study of clinical education in Canada, the United States, and the United Kingdom showed senior faculty of U.S. schools doing the least amount of teaching: 25.1% versus 33.6% for Canada and 47.3% for the U.K. U.S. junior faculty do slightly more at 31.7%, but again less than Canada at 44% and U.K. at 36.7%. Most troubling is that residents are reported as doing 43.2% of all clinical teaching in the U.S. For Canada the resident percent is 22.4; for U.K., 16%. The authors felt this finding was related to U.S. deans being dissatisfied with the evaluation of clinical skills of medical students. This was in contrast to the Canadian and United Kingdom deans.

The issue of residents as teachers in ambulatory care settings must be explicitly addressed. More senior residents may be able to function like faculty. To do so, they need to have their faculty responsibilities clearly identified, to be super-

vised and assisted in their faculty role, and to be aware of the need for their assessments to be as objective as possible. They are, however, not essential to the quality of the education experience and may impede it. Our medical students value clinical experiences not encumbered by the presence of residents. I expect the view is not unique among U.S. medical students.

Money and space are also issues for education in ambulatory care settings. From the mid-sixties to 1988 federal funds for teaching and research have dropped from fifty-five percent of medical school funds to twenty-four percent. During the same period patient care revenue moved from six percent to near forty percent.

All I can conclude from this is that things are tough all over. I am convinced that with proper management the costs of education in the ambulatory setting can be accommodated through the usual payments generated by the hospital teaching clinic. Kassebaum[11] and Kosecoff et al[9] have addressed the issue of costs, space, and faculty and staff time. Productivity tends to favor the resident and faculty mix above certain minimum numbers, and faculty supervision requirements for residents may be overstated. Faculty and staff time and space availability analysis showed more expansion capability than generally acknowledged.

Our principal teaching hospital just financed a feasibility study of combining the school-based family practice group with the hospital-based group in a new location with adequate space for medical student and resident education. The consultants project a break even in two years if hospital generated revenues are considered and in four years without hospital revenues. To do so assumes continuing Medicare reimbursements, state residency capitation grants for family medicine residents, and the same ratio of faculty salary participation by Mercer. The point needs to be made that what will work for Mercer may not work elsewhere, and that national health policy goals, i.e., more training in ambulatory care settings, are not likely to be successful without uniform funding incentives.

In summary, quality training is possible in the ambulatory setting at the predoctoral level. Like training anywhere, there needs to be attention to goals, expected competencies, and assessment. Institutional support is necessary, and curriculum and faculty reward systems will require attention. Space, time and costs need to be carefully assessed.

REFERENCES

1. Physicians for the Twenty-First Century: Report of the Project Panel on the General Professional Education of the Physician and College Preparation for Medicine. *J. Med. Educ. 59(11, Part 2)*:1-208, 1984.
2. Gastel B, Rogers DE. (Eds.) Clinical education and the doctor of tomorrow. Proceedings of the Josiah Macy, Jr. Foundation National Seminar on Medical Education, Adapting Clinical Medical Education to the Needs of Today and Tomorrow, June 15-18, 1988. New York: The New York Academy of Medicine, 1988.
3. Moore G. Opening the ambulatory setting: Teaching medical students what they need to know. Proceedings of the Josiah Macy, Jr. Foundation National Seminar on Medical Education, Adapting Clinical Medical Education to the Needs of Today and Tomorrow, June 15-18, 1988. New York: The New York Academy of Medicine: p. 86, 1988.
4. STFM Working Committee to Develop Curricular Guidelines for a Third-Year Family Medicine Clerkship. Curricular guidelines for a third-year family medicine clerkship. Kansas City, MO. The Society of Teachers of Family Medicine, 1990.
5. Feltovich J, Mast T, Soler N. Teaching medical students in ambulatory settings in departments of internal medicine. *Acad Med:40,* January 1989.
6. Perkoff G. Teaching clinical medicine in the ambulatory setting. An idea whose time may have finally come. *N Engl J Med* 314:27-31, 1986.
7. Woolliscroft J, Schwenk T. Teaching and learning in the ambulatory setting. *Acad Med*: 644-648, November 1989.
8. Gutmann L. An ambulatory neurology clerkship for third year medical students. A 20 year perspective. *Arch Neurol* (43):651-652, 1986.
9. Kosecoff J, Fink A, Brook RH, et al. General medical care and the education of internists in university hospitals: an evaluation of the Teaching Hospital General Medicine Group Practice Program. *Ann Intern Med* (102):250-257, 1985.
10. Schwarz R, Bannerman J, Buchbinder S. Clinical education in a changed health care system: Canada, the United Kingdom, the United States. Clinical education in a changing health care system. American Medical Association: 71-80, February 1990.
11. Kassebaum D. Accommodating educational cost escalation. Clincal education in a changing health care system. American Medical Association:127-134, February 1990.

Kelley M. Skeff, M.D., Ph.D.
School of Medicine
Stanford University

THE CLINICAL TEACHER--A FORGOTTEN LINK IN MEDICAL EDUCATION

It is a pleasure to present to the Committee on Graduate Medical Education and to share my thoughts and experiences on an important area -- providing feasible methods to assist faculty in their important role as teachers. Before I begin my discussion, I wish to point out that I am going to stray somewhat from the focus of this conference. Although I firmly believe that teaching in the outpatient setting can and should be improved, I do not believe that efforts for teaching improvement should be limited to the outpatient setting. Thus, I am going to talk about the improvement of teaching in medicine in all areas, both inpatient and outpatient alike.

In addressing this issue, I would say up front that I hope to leave the Committee with both concern and optimism. The concern I wish to bring about is the concern for the need to improve clinical teaching. Clinical teachers can be more effective. The optimism that I wish to emphasize is that clinical teachers, faculty and residents alike, can be assisted to improve their teaching effectiveness, and that there are some feasible and effective ways of doing so.

To accomplish my goals, I would like to focus on 3 areas: 1) concern about what we may be teaching, 2) possible reasons why we have not paid adequate attention to the development and use of teaching improvement methods, and 3) to share with you the design and some results of the Stanford Faculty Development Program, which is designed to assist teachers across the country to improve their teaching effectiveness. In so doing, I hope that you will not only see the benefits which have come from funding of programs of faculty development in the past, but also to emphasize the ongoing need for such funding, both for the development of new programs and the continuation of already developed and successful programs.

To stimulate you to get concerned about what can be learned or reinforced as part of medical education, I would like to show you some videotapes of clinical teaching. These tapes are reenactments of actual clinical teaching episodes which we collected during our previous research. The scripts were taken off of the original tapes and the parts were memorized and reenacted by other faculty, housestaff, and students for the purpose of developing ways to improve clinical teaching.

In observing these tapes, I would like to have you focus on some of the concerning lessons which may be taught in the process of medical education.

VIDEOTAPE REVIEW

As we can see from these tapes and as most of us can document from our own personal experience, important worrisome lessons, such as covering up or avoiding what we do not know, can be reinforced by teachers who are unaware or untrained in teaching. We could look at several other tapes showing concerning lessons which we may be teaching. However, time does not permit this today. Let it suffice to say that there are aspects and outcomes of our teaching process which could be modified to the benefit of the learners.

The second goal I would like to address is the identification of some possible reasons why we have not put more effort in the improvement of teaching skills. Although there are several reasons, I will focus on three: 1) a lack of recognition of the complexity of the clinical teaching process, that is a lack of recognition that it is something which deserves work, 2) a lack of recognition of the potential for improvement by teachers themselves, and 3) a lack of feasible and available methods for assisting teachers to improve.

First, let us look at the complexity of the teaching process. Our own research and the literature from the field of education indicates that a teacher who is working on a comprehensive approach to teaching has to deal with at least 7 areas.

I will not go into these areas in great detail as time will not permit and the areas are discussed in some detail in one of the articles that you have been given. However, I would like to mention the 7 aspects of teaching just to show the variety of areas they address.

They include: 1) the establishment of a positive learning climate, developing a place that learners and teachers both want to be; 2) controlling the teaching session, making it focused and efficient; 3) communication of educational goals so that the learner knows what they are needing to master; 4) using techniques to enhance understanding and retention so that the learners have the best chance of mastering the material being taught; 5) evaluation of learners to be sure that they have become competent; 6) feedback informing the learners about the areas they have achieved and the areas for further work; and 7) promoting self-directed learning so that the learners continue to learn on their own when they finish their formal education.

Although it would be enough for a teacher to keep these 7 areas of teaching in mind, it is important to note that each area has sub areas and that each sub area has several teaching behaviors that can enhance teaching effectiveness. For example, if we look just at the area of establishing a positive learning climate, that area has 4 sub areas and at least 20 teaching behaviors that a teacher might consider using to enhance teaching effectiveness. So the process is complex and that complexity, I believe, has been underestimated as we have expected that excellent teaching abilities should be automatic when one completes medical training.

The next area that I believe has impeded the improvement of clinical teaching is the lack of recognition that teaching can indeed be improved. To support this conclusion, I would like to present some data from our own research showing the self-assessment of clinical teachers regarding their own clinical teaching skills. As part of their participation in our present teaching improvement program, attending physicians and housestaff were asked to rate their teaching skills from the 7 areas previously covered in this presentation. The teachers rated their skills on a 5-point scale before they experienced the teaching improvement method (a pre-intervention rating). Then, following the 14 hour course, they again rated themselves, rating their abilities before the training (called a retrospective pre rating) and after the training (a post-intervention rating). There was a consistent pattern.

Following the training, the participants consistently rated their pre-training levels lower than they did before the training, thus indicating that they recognized their potential and need for improvement more after they had completed the training than they did before. Thus, the potential for improvement recognized after the training may be largely unrecognized by the individual teacher until training is completed. The statement of one Stanford resident after taking the teaching improvement seminars pointed out his discovery that his teaching could be improved.

The third and final impediment that I will discuss is the lack of available feasible methods for teaching improvement. In addressing this impediment, I would like to present briefly the results of our research on developing teaching improvement methods, and specifically focus on our present method designed to assist teachers across the country. I hope these results are encouraging to you and provide an incentive to continue efforts to provide funding for teaching improvement methods for faculty and residents.

The 3 methods we have studied have included the intensive feedback method, a single 2-hour seminar method, and now we are studying a dissemination method comprised of several seminars.

The first method we studied was the intensive feedback method. This method, reported in the American Journal of Medicine, consisted of a teacher's review of a) a videotape of their own teaching, b) ratings of their teaching by students and housestaff and c) their own self-assessment ratings. This method was studied using a randomly assigned controlled study in which faculty at Stanford were randomly assigned to either receive this method of teaching improvement at the midpoint of a 1-month inpatient ward teaching rotation or not. The teachers in both intervention and control groups were videotaped early and late in their teaching rotation and were evaluated by housestaff early and late in their rotation.

The only data I want you to focus on are the average ratings of the early and late rotation videotapes done by blinded raters.

PRE-POST VIDEO RATINGS

	Pre	Post
Intensive Feedback Group	3.35	3.37
Control Group	3.36	3.09

*P<.03

These trained raters used a scale derived from the 7 category system presented earlier. The ratings of the end-of-rotation videotapes from the intervention group were significantly higher than the control group.

When faculty in the control group were interviewed, they indicated that the ratings probably represented burn-out. That is, they were not surprised that they were not teaching as well at the end of a month as an attending as they were at the beginning. I believe these data provide evidence of the difficulty of the teaching role. The responsibility of faculty and residents as teachers is great and can be exhausting. In fact, the pressures of the role itself may bring about a deterioration in teaching performance.

From this study, we moved to a method of teaching improvement that we felt could help several teachers simultaneously, a 2-hour seminar method. This method consisted of a seminar in which faculty a) viewed videotapes of clinical teaching in a small group, b) were introduced to a method for analyzing their teaching, c) had a collegial discussion regarding the tapes, and d) identified personal goals for their own teaching. This method was studied in 3 institutions in the San Francisco Bay Area, again using an experimental design.

I would like to focus on one result of that study reported in the Journal of General Internal Medicine.

When the goals identified by the individual faculty were classified according to the categories of teaching discussed in the seminars, it became clear that faculty were able to identify several areas in which they wanted to improve their teaching. In fact, over 50% of the participating faculty identified goals for teaching improvement in all of the aspects of teaching. Thus, this study pointed out that given the appropriate assistance, faculty recognize that there are several areas in which their teaching could be improved.

This study led to the development of the method we are presently implementing and studying, the Dissemination Method. In this method, medical faculty come to Stanford for one month and are taught the knowledge and skills necessary to return to their home institutions and conduct a series of seminars to train their own faculty and housestaff in the areas of 1) clinical teaching, 2) preventive medicine, and 3) medical decision making. These seminars are designed to assist faculty and housestaff to improve their knowledge and teaching in these areas. At this point, 54 faculty from 41 institutions have been trained in this program.

The results of this method indicate that over 90% of faculty who participate in these series of seminars rate them as useful and would recommend them to other faculty. Therefore, we feel

this provides optimism for teaching improvement in many institutions.

How would I like to conclude? I think it is important to point out that the constant improvement of patient care will result from the achievement of two main goals of academic institutions - research and clinical teaching. It has been clear in the past that the conduct of research is difficult and that special training is necessary to gain those skills. I would propose that the conduct of teaching is also difficult. However, we have operated under the assumption that the skills of teaching should be automatically acquired. Our research and that of others would indicate that this is not so.

However, somehow we must continue to figure out how to fund these programs to improve teaching.

- The importance of the field of medicine mandates it.
- The students and housestaff being taught deserve it.
- And the faculty and housestaff who are teachers can benefit from it.

O.J. Sahler, M.D.
Department of Pediatrics
University of Rochester

PEDIATRICS IN THE AMBULATORY SETTING

Introduction:

In March 1989, AMSPDC (the Association of Medical School Pediatric Department Chairman) surveyed its membership regarding educational programming throughout the 4 years of medical school. The effort was chaired by Dr. Robert Hoekelman of the University of Rochester Department of Pediatrics, in response to the question, "How can we attract more and better medical students into Pediatrics?" Although some in AMSPDC questioned whether or not more students were needed, there was unanimous agreement that a pool of better qualified candidates, especially those interested in research careers, was desirable.

Interestingly, the number of houseofficer slots in Pediatrics that went unfilled in the match of 1989, which took place shortly after the survey began, was staggering and affected many highly-rated programs. In 1990, the number of programs that went unfilled was even greater, making the events of 1989 seem less like an aberration than the beginning of a trend. And, I believe, convinced most pediatric educators that we do, indeed, need more, as well as better, trainees.

The movement toward a reduced work week which requires more people to cover the same work load certainly has contributed to the vacancy problem in many residency programs. For Pediatrics, however, like other primary care specialties, job satisfaction also may be an important, and potentially negative, factor in medical students' choice of career. For example, when I became clerkship director at the University of Rochester in the fall of 1977, only 3% of our graduating class was selecting Pediatrics as a career. The disenchantment with Pediatrics that so many of our students felt was well articulated by one student who said: I can't imagine going into a specialty where all I treat is dying patients.

That student's comment led me to reflect on the design of our Pediatric clerkship at that time; students spent 6 weeks on the inpatient service, and, except for a half day in a pediatrician's office, did, indeed, deal almost exclusively with very sick and often, dying children. Had I not been lucky enough to have had other experiences in Pediatrics during medical school, I probably would not have chosen it as a career, either.

Although I became a clerkship director 12 years before the AMSPDC review of undergraduate education, my goal was much the same: to attract more students to the specialty. I can not say that I also had as a goal attracting better students because the caliber of our Pediatric applicants has always been good; but I did have as a goal **their better understanding** of what Pediatrics is all about.

Before I share with you an enhanced version of a presentation about the outpatient portion of our clerkship that I gave at the Ambulatory Pediatric Association annual meeting in Anaheim in the spring of 1987, I feel it is vital to highlight one particular finding from the AMSPDC survey that apparently astounded the departmental chairs but should come as no surprise to clerkship directors or those who read closely those personal statements that residency applicants (regardless of specialty) slave over in trying to answer the question "Why I want to be a ..." pediatrician, internist or whatever: personal experience during the third year clerkship is one, if not the most important, of the determining factors in career selection.

Now, on to details about our program. At the University of Rochester,* the goals of the 6 week categorical clerkship in Pediatrics for third year students are to:

1. Expose students to children at different stages of development;

2. Help students develop an appropriate approach to diagnosis and management of common Pediatric problems; and

3. Provide students with the opportunity to consider Pediatrics as a potential career choice.

Twelve students are usually assigned to the service at Strong Memorial Hospital for each of the 6 rotations per academic year. Prior to 1977, the clerkship consisted entirely of inpatient care. However, decreasing hospital admission rates and the heavy emphasis on tertiary care of very sick children interfered with the effectiveness of this inpatient based educational experience. The ambulatory setting, which was essentially unutilized for student teaching, appeared to provide some solutions to these problems: the volume of patients is high and most patients present with relatively low risk or stable problems thus permitting students to function more independently and to focus on maintenance of function in a basically healthy population.

Accordingly, in 1977, the clerkship was divided into 3-week blocks, giving the students equal time in the inpatient and ambulatory settings.

The inpatient experience is similar to that found in any traditional tertiary care center. The mixed medical-surgical wards are defined by patient age into the infant and toddler unit, the school age unit, and the adolescent unit.

A pair of students is assigned to each 24 bed unit for their inpatient experience. Each student is encouraged to work up and follow 6 to 9 patients during the 3-week block, including writing daily progress notes and orders, communicating with other professional staff members, and assisting with procedures under appropriate supervision.

During the ambulatory portion of the clerkship, students rotate each half day through a wide variety of both general and subspecialty clinics and the Emergency Department. They also spend four mornings in Full Term Nursery, a half day in a private office, and up to two half days at selected community sites such as a development center or a secure residential facility for adolescent boys.

In all subspecialty clinics, direct preceptorship is provided by faculty members in the manner that is most comfortable for their teaching style and the composition of their clinic population. Because of this, student participation and responsibility in each clinic vary. For example, the Adolescent Clinic, to which a student is assigned for three successive Monday afternoons for continuity, the student works up one or two new or returning patients each session, writes the chart notes, contacts consultants or the referring physician as necessary, and presents the patients at the teaching conference held immediately following clinic. In Hematology Clinic, the student is assigned to a patient being seen in follow-up, and after reviewing findings and plans for management with the attending physician, writes the interval note. In Arthritis Clinic, the student is assigned to work-up either a new or established patient; at the end of the session the senior faculty member rounds from room to room with the entire group of staff and trainees to review each patient seen. The student then writes the chart note for the patient he or she has actually worked up.

The Cardiology Clinic provides a notable exception to the general rule of direct patient care by the student. In this clinic, which schedules 15 to 20 patients in an afternoon, the student follows the cardiologist from patient to patient. The faculty member's goal in this exercise is to precept the student doing as many cardiovascular examinations as possible.

General ambulatory pediatric patients are seen in the Emergency Department, the acute care clinic serving housestaff continuity patients, and the private practices of the full-time ambulatory faculty. In general, the student sees the patient first, reviews findings and management with the preceptor, joins the preceptor while he

or she examines the patient, and then documents the visit in the medical record.

Patients are preselected for student contact based on severity of illness and the potential educational value of the encounter. In the subspecialty clinics, the actual selection is usually done by either the physician or nurse specialist most intimately acquainted with the patients scheduled to be seen. Given that the students are novice trainees who are less secure in their role and who will take more time than a houseofficer or faculty member to complete the evaluation, patients and families who are more likely to be cooperative and to enjoy the role of sharing their experiences with the illness are chosen whenever possible. The system is, of course, not fool proof: occasionally students must deal with hostile or uncooperative patients and families, especially in the acute care setting of the emergency department where frustration, anger and anxiety often prevail. Regardless of the setting, however, the overriding educational goals are to provide the student with: 1) the opportunity to be the first medical care provider to evaluate the patient; 2) close preceptorship to enhance data gathering skills; 3) experience in presenting patients in an efficient, concise manner; 4) experience in formulating appropriate diagnostic or management plans; and 5) responsibility for appropriate documentation of the patient visit.

The quality and quantity of instruction that occurs during any clerkship rotation are difficult to assess. However, because much of clinical learning is predicated on opportunities to see and do, the frequency of student exposure to different kinds of patient problems is one possible measure of the educational experience. Another measure could be the proportion of the student's time that is devoted to such activities as direct patient care or individual instruction from faculty.

In order to monitor the breadth of student exposure, clerks are asked to keep a log listing name, age and diagnosis of each inpatient and ambulatory patient they see for whom they write a note. On the inpatient service this is defined as any patient for whom they write a medical or surgical admission history and physical examination, a transfer acceptance note, or an on-service note, the expectation being that the student will follow these patients closely through hospitalization.

In the outpatient setting, the students are asked to log any patients for whom they do a new patient work-up, or write an ED, acute illness, or interval note. They are instructed not to log patients whom they have merely examined at the invitation of the preceptor because of interesting physical findings or only rounded on as part of a group teaching exercise. The data that will be presented regarding breadth of experience as measured by patient contact are derived solely from the logs the students kept with the exception of the cardiology clinic data. Because no notes are written, the students did not log any of the cardiac patients. However, because this clinic, with its large volume of patients, provides substantial teaching, one of the cardiology faculty was asked to list all cases seen during several typical clinic sessions; the data were then weighted.

In order to monitor the amount of student time devoted to direct patient care and clinical instruction, clerks were asked to keep activity diaries for one morning, one afternoon and one on-call evening from both the inpatient block and the ambulatory block. Categories of activities to be recorded included direct patient contact, individual faculty teaching, individual interactions with fellows or houseofficers, formal teaching conferences, work rounds, chart work and personal time.

Another measure of the desirability of teaching in the outpatient setting was derived from a questionnaire administered to the faculty members in charge of each of the clinics. Open-ended questions were asked regarding program strengths and weaknesses and ideas for change. It should be noted that in the majority of instances, these faculty members were division chiefs or heads of clinical services. Because their

oversight of teaching programs include both the inpatient and the outpatient services their comments reflect a comprehensive view of the entire spectrum of learning opportunities available to students. Thus, their comments would not be biased by any particular allegiance to the outpatient service.

Results:

Patient contact data for this report were collected from November 1977 to August 1986. Of the 648 pediatric clerks at Strong Memorial Hospital during that 9 year period, 459 (71%) submitted logs. Students verbally reported almost 100% completeness in logging inpatients primarily because attaining their goal of 6 to 9 patients was seldom achieved and they felt some pressure to list all patients they worked up. On the other hand, the ambulatory logs tended to be less compulsively kept because of high patient turnover. Thus, the ambulatory patient encounters reported probably represent a 10 to 15% underestimate.

Thirteen percent of reported patient encounters occurred in the inpatient setting and 87% of encounters occurred in the ambulatory setting. Because the data from Cardiology were derived differently, we have excluded those patient contacts from the values. Even without including cardiology and despite the equal calendar time devoted to each setting, the vast majority of patient encounters still occurred in the ambulatory area. The average number of work-ups (7 during the 3 weeks on the inpatient service and 25 during the 3 weeks in the ambulatory area) that students performed in each of the two settings is an indication of the level of direct patient care activity. With regard to the outpatient department, this pace is about 1.3 patient workups per half day after correcting for time in the nursery, special lectures and visits to private offices or outside facilities.

General ambulatory patients accounted for almost 3/4 of the encounters, reflecting the particularly high volume of patients seen in the acute care clinic and the Emergency Department.

In the 15 most common diagnoses of patients worked up by students on the inpatient service, it is apparent that, for example, roughly 1 to 4 students managed an inpatient with asthma or epilepsy and 1 in 5 students managed an inpatient with pneumonia.

Of the 14 diagnoses occurring among general ambulatory patients at least 1 to 5 students are likely to encounter the problem.

Comparing the five most frequent diagnoses encountered on the inpatient service, the general ambulatory service, and the subspecialty clinics, major overlaps occur in the diagnoses reported for patients seen on the inpatient service and in the subspecialty clinics. However, the content and process of the encounters are clearly different in the two settings. For example, learning centered around an inpatient with epilepsy is likely to involve sophisticated discussion about diagnosis and therapy of a difficult-to-control disorder; whereas, learning centered around an ambulatory patient is likely to involve issues of appropriate school placement, participation in sports or driving, family adaptation to the disorder, and duration of treatment in a well-controlled patient. These encounters are thus complementary rather than redundant and provide the student with an appreciation for the spectrum of a given disease.

There are three important differences between the inpatient and outpatient settings in the way a student's time is spent. Students in the ambulatory setting spend greater time, on average, in direct patient contact and individual discussions with faculty members, little time in formal teaching conferences, and no time on work rounds. No differences were found in time devoted to chart work, interactions with houseofficers, or personal matters.

Strengths of the ambulatory setting as a learning environment cited by faculty members included: the similarity to "real life" clinical medicine; the availability of a large volume of patients appropriate for medical student contact; increased exposure to those conditions managed

by subspecialists, to common illnesses, and to the type of problems that typically present to the ED; the quantity and quality of one-on-one patient-centered precepting and teaching; the emphasis on basic data gathering techniques; and the valuable low-risk opportunities students have to do the initial evaluation of a mildly to moderately sick child. Weaknesses included the 3-week length of the ambulatory rotation which limited opportunities for follow-up and the increased time students require to evaluate patients which can interfere with patient flow. Faculty were, however, unanimous in support of continuing the ambulatory block feeling that the logistical drawbacks were minor compared to the educational benefits. Most felt the ambulatory block should be lengthened; two even suggested discontinuing the inpatient portion of the rotation.

Discussion:

Clearly, it is the responsibility of individual programs to provide the kind of learning experiences which are most conducive to a valid medical student course in pediatrics. Keeping in mind that for many students the clerkship will be their only formal training in the care of children, we must, at a minimum, provide them with the experience necessary to recognize a sick child (even if they do not know exactly how to treat the problem) and to remember that children are not miniature adults so that they will seek appropriate consultations should their future practice include occasional child patients.

We have attempted to devise a balanced program which incorporates the rigor of inpatient management of very sick children with the opportunity and challenge of being the first health care provider to evaluate a child with less severe illness. We also have attempted to incorporate issues of well child care and of functioning in the community despite the presence of a chronic disability. Lastly, we have tried to provide the students with opportunities to work directly with subspecialists to expose them both to the challenges and dilemmas faced by the clinical researcher (and, so, perhaps, capture their interest and imagination) and to the role played by the consultant.

We have found that each of the major components of our health care delivery system offers unique, but complementary, instructional opportunities.

The faculty have been receptive to student participation, especially when it can be incorporated readily into the existing structure of their usual patient care routine. Careful triage of patients appropriate for medical student contact is essential to a good educational experience and a smoothly functioning ambulatory system. The students find the diversity of the various clinics stimulating and especially appreciate learning about specialized assessment techniques from the appropriate subspecialist directly, quickly, and accurately.

The changing nature of medical care dictates that the era of exclusively bedside teaching has passed; fortunately, to take its place, the day of chairside teaching has arrived.

* Presented, in part, at the Ambulatory Pediatric Association Annual Meeting, April 30, 1987, Anaheim, California.
The contribution of James R. Bonner, M.D., to data preparation and analysis is gratefully acknowledged.

Steven A. Wartman, M.D., Ph.D.
Division of General Internal Medicine
Brown University

GENERAL INTERNAL MEDICINE IN THE AMBULATORY SETTING

My name is Steven Wartman and I am currently Professor of Medicine and Community Health, and Director of the Division of General Internal Medicine at Brown University in Providence, Rhode Island. I am also a past president of the Society of General Internal Medicine (SGIM). For over ten years, I have been based at the Rhode Island Hospital, the largest hospital in Rhode Island, where I founded and continue to direct a large general internal medicine (or primary care internal medicine) residency training program. My remarks today will reflect my experience as a residency director during a period of rapid change as well as the experience of serving as a consultant, grant reviewer, visiting professor, and conference attendee for various institutions, agencies, universities, foundations, and federal panels.

I plan today to discuss medical education in the ambulatory setting from the perspective of general recommendations for new emphases in ambulatory care education, and conclude with some recommendations for graduate medical education as a whole.

GENERAL INTERNAL MEDICINE

The first question to consider is: how does general internal medicine differ from general pediatrics and family medicine in terms of ambulatory education? Other than the nature and scope of the patients being cared for, it does not appear to me that the disciplines vary very much when it comes to the basics of ambulatory care education. The same education issues seem to apply in most settings. The differences that do exist seem to be, on the whole, narrowing nationally, and all three disciplines need to focus more on their similarities than on their differences.

Ambulatory care education and training in internal medicine in many institutions is the responsibility of divisions of general internal medicine in departments of medicine. These divisions have grown rapidly in the last 15 years and have been the impetus as well as the focus of much ambulatory care teaching. As these divisions are part of departments of medicine, they are but one amongst a larger number of subspecialty divisions, each with its own organ system and narrow field of interest. As such, the issue of the education of generalists versus subspecialists is an important one for departments of medicine which collectively face some major challenges in the years to come. These challenges include: the way medicine is practiced; the way medical students and residents are educated; and the way these departments are organized. It seems to me that, in moving rapidly ahead in the pursuit of advancing knowledge within highly specialized fields, departments of medicine can lose much that has traditionally held them together. The approach to the general patient, the hallmark of the internist, has in some departments been lost. Departments of internal medicine need to return to the principle that their most important resource is the patient-physician interaction. Such a focus has far-reaching implications for how to practice, educate, and conduct research. In addition, departments need to consider new liaisons with other disciplines, new ventures into the community, and new relationships with their parent universities. Finally, departments must remember to let good ideas, not just economics, be the driving force behind their programmatic goals.

AMBULATORY CARE EDUCATION

I. CHALLENGES

The challenges facing us in this area may be described as the following:

- develop new teaching models
- promote respect for teaching
- inspire students

Learning theory and its accompanying teaching methodologies have received little attention at the residency level. As a result, the learning theory base for determining the content and sequence of residency education is strung together by a series of assumptions which have rarely been tested. While more of our education is shifting to the outpatient arena, there are inconsistencies between the traditional inpatient education model and the ambulatory model. Since physicians produced under the current model have generally been acceptable, we seem to be operating under the assumption that this model can continue with whatever shifts in health care and medical education financing occur. We need to ask how much is the current model dependent on the inherent quality of the physician as opposed to the model itself. (Was there ever really a model?)

Teaching itself needs to regain high stature in our medical schools and residency programs. In my opinion, teaching has become devalued as compared to research and clinical income generation. The central importance of teaching needs to be reaffirmed through academic promotion and structured salary incentives.

Students and residents must not be left out of the planning. They are, after all, the focus of these educational efforts. Particularly, given the current climate of student opinion which seems to be away from primary care and generalism, we need to make every effort to inspire our students and not to turn them off.

II. PROBLEMS

The problems we face in our education programs, while numerous, can be categorized:

1. Lack of a theoretical base

As mentioned previously, the process of medical education is full of unexamined assumptions at virtually every level. We need to examine these assumptions and, based on education theory, discern the degree to which they facilitate or hinder medical education, as well as to develop new ones for testing and implementation.

2. Lack of a research base

Medical education research has been undervalued and underfunded, and, not surprisingly, the current state of research in medical education is suboptimal. More basic work is needed. Many studies are hampered by weak experimental designs.There is a shortage of focused research. Long-term studies are lacking; there is poor dissemination of research findings. These faults must be corrected.

3. Service/education conflict

This troublesome issue, particularly in our residency training programs gets to the core of the issue of education reform for many of us. It seems to me that this conflict often serves as a fundamental barrier to change in our programs, and urgently needs resolution. It is clear, for example, that many residency programs increased the number of positions offered in the mid 70s through the mid 80s largely because of the growing service needs of their institutions, rather than in critically improving or altering the quality of internal medicine residency education. Many internal medicine programs are now reducing their size, requiring physicians on their staffs to take care of more patients without residents. It is my contention that we need to better delineate the educational component of residency education, particularly those components that are intertwined with patient care. We need to view patient care as an invaluable (but not the only) source of learning to be developed in an educational setting. My colleagues, Drs. O'Sullivan and Cyr, and I have discussed this issue in more detail in another paper.

4. Costs

The financial climate in health care will continue to be one of restraint and cost containment. Faculty have become more preoccupied with the generation of clinical practice income, which threatens to decrease time available for teaching. In addition, there is the notable lack

of a financial structure to accommodate the transition from inpatient to outpatient education. I will comment on this later on and offer a specific recommendation.

III. CONTENT OF AMBULATORY EDUCATION

The educational needs of our students and residents for the ambulatory setting are growing rapidly. The major content areas are: (1) developing a sound knowledge base of ambulatory medicine which includes the subspecialties as well as primary care; (2) learning the interdisciplinary interfaces of ambulatory medicine, such as dermatology, office gynecology, as well as the evolving ambulatory specialty areas of occupational medicine, geriatrics, and clinical epidemiology; (3) psychosocial medicine; (4) the role of the humanities and social sciences; and, (5) issues in medical practice.

IV. ORGANIZING AMBULATORY CARE EDUCATION

I would now like to briefly review an organizational approach to teaching in the ambulatory setting.

1. Learning Climate

Much has been written lately concerning stress in residency training. Sleep deprivation and heavy inpatient loads are some of the major factors contributing to stress, and stress is generally viewed as a negative factor in learning. It is a particularly serious problem for ambulatory education in that much of this stress may be "passed on" from the inpatient setting. Learning and liking ambulatory medicine is difficult for an already overcommitted resident. The ambulatory experience must be organized in such a way as to minimize the negative impacts of stress.

In addition, the learning climate of the ambulatory setting has some unique features which distinguish it from the traditional inpatient setting. First, it is characterized by a different pace and orientation. It is essential that teachers in this setting recognize this from the outset and to strive to adjust their teaching styles and their students' learning styles accordingly. For example, it is common for beginning students or residents to attempt to diagnose and manage all the patient's problems and health maintenance issues at the first visit. They instead need to learn to manage their time with patients by prioritizing problem-solving and adjusting to the different tempo of ambulatory care. Seemingly trivial, but actual difficult issues, such as when to schedule the next appointment for the patient, or what tests to order and when, can frustrate both student and faculty alike if attention is not drawn to this early on and made part of the teaching effort.

A second important issue involves the increased autonomy and independence of the patient in the ambulatory setting. Ambulatory patients function as part of a free-living environment which is quite different from that of the patient in the hospital bed. Learning the skills needed to develop outpatient relationships with patients is key to successful teaching in the ambulatory setting. Otherwise, faculty and students will express frustration when patients fail to show up for appointments, miss scheduled tests, or do not understand therapeutic regimens.

Thirdly, students and residents are faced with increased clinical responsibility in the ambulatory setting. Unlike the inpatient setting, where other residents, consultants, and attendings see the patient and write notes in the chart, the student or resident may be the only person to perform a complete history and physical on an ambulatory patient. If this is coupled with a weak knowledge base of ambulatory medicine, difficulty in getting to the faculty preceptor, or pressure from other responsibilities (such as sick inpatients), the learner may find the ambulatory environment too stressful and develop a negative image of ambulatory care.

2. Curriculum Development

Significant curricular development is required.

Without specific and realistic curricular goals, the ambulatory experience rapidly becomes vague, diffuse, and uneven. Many groups have recently published or are publishing curricula for outpatient medicine.

3. Block Training

The concept of block training is one which I feel is essential to the development of a successful ambulatory education program. Residents need protected curricular time to develop the attitudes, knowledge, and skills essential for the care of the ambulatory patient. This is best done in blocks of time which combine primary care with other aspects of ambulatory care, including psychosocial medicine, medical ethics, and self-directed learning experiences.

4. Continuity Training

Continuity training refers to regularly scheduled outpatient sessions which allow students and residents to follow their own patients over time. There is much debate over how much continuity is appropriate. For example, the Federal Government used to require general internal medicine grantees to spend 25% of their total training time in continuity of care. It has recently been changed to 20%. Regardless, it must take place at a minimum of once per week throughout the residency years, and preferable more often as the norm.

5. Site Development

Another issue is where the continuity site should be located (e.g., on or off campus), and what type of practice (e.g., HMO, clinic, private office, etc.) it should be. At a minimum, sites need to provide an appropriate and hopefully normative patient base along with appropriate supervision by excellent clinician educators.

6. Changing Role of Faculty

The changing role of faculty refers to the need in many programs to increase the proportion of faculty educators and to enhance the teaching role of specialists and subspecialists to reflect the ambulatory portion of their specific area. This may require in many instances specific training and/or re-tooling of faculty.

7. Evaluation

Finally, comprehensive evaluation of the educational experience must be a high priority, especially if we move students and trainees off-site for their ambulatory experiences.

V. NEW EMPHASIS IN EDUCATION

Lastly, new emphases in medical education are required to meet the needs of the future medical practitioner in the ambulatory setting, needs which have been poorly addressed in the past. These new emphases include:

- Self-assessment
- Self-directed learning
- Learning to incorporate change into medical practice
- Talking and listening
- Health planning and prevention

GRADUATE MEDICAL EDUCATION IN GENERAL

I would now like to turn to issues that affect graduate medical education more broadly. While specifically not my charge to this group, I feel that these issues need to be commented upon because of their impact on all of residency education, including the ambulatory component.

1. Financing

The financing of graduate medical education relies in large part on monies from the federal government, particularly Medicare, that flow directly to hospitals. I believe that is time to ask if this system of directing dollars to hospitals is optimal or even appropriate. In my opinion, it is time to change the current system. Currently, these monies flow int a complex web of hospital budgets, get inextricably tangled up in patient care, and are too far-removed from the educa-

tion program. While it is appropriate to link graduate medical education with patient care, I believe that it is inappropriate to do so in such an inclusive fashion. Funds disposed in this manner become part of a complex patient care equation which is confusing, mixes apples and oranges, and limits education accountability and program development. The money, in my opinion, should be directed closer to the source -- namely, the education programs themselves. The closer to the source, the greater the efficiency, economy, flexibility, and accountability. An example supporting this need for change involves the pressing goal of shifting more training into the ambulatory setting. In the current system, it is difficult to channel funds to out-of-hospital settings. If the money was under the aegis of the program director, for example, he or she could contract with hospitals, ambulatory care settings, and other organizations or educators to provide the necessary education experiences. I believe that this could at least be revenue neutral and, eventually, less costly through increased economies of scale. Certainly, the "mystery" in cost accounting residency education would be virtually eliminated.

If not to hospitals, where should the funds be channeled? I don't believe that the medical school should be the recipient of these funds. First of all, many medical schools are sufficiently removed from the graduate education arena as to be unable to effectively manage them. Secondly, the idea of a dean (or department chair) presiding over the funds is also unattractive. It again installs layers of bureaucracy and creates potentially difficult political problems.

I believe the funds should be made available to the program director who is then responsible for contracting the needed educational experiences from hospitals, ambulatory sites and so forth. In order to receive the funds, the program must, of course be accredited, but also must be approved by a local committee, chaired by the medical school dean. This would ensure quality and educational accountability. Where programs are not affiliated with medical schools, such an affiliation could become required within a specified period of time.

2. Medical Education Research

There is a desperate need for medical education research and development. I am not familiar with any other enterprise of such scope and magnitude (running well in the billions of dollars each year) that has so little funds devoted to R & D. My colleague, Patricia O'Sullivan and I have written about this in detail. Briefly, we feel that medical education research has been undervalued and underfunded, and that this has had negative consequences on our medical education and health care enterprises. We need to assess the impact of our medical education system and the effect (and costs) of any changes introduced. We need to view these changes as "experiments" to be analyzed, so schools and residency programs can make knowledgeable decisions. These decisions can be very far-reaching in terms of faculty development, costs, and health care delivery. It is also important that efforts be made to link our education programs to health care outcomes, as this is (or should be) the ultimate purpose of a medical education. We propose in our paper the creation of a National Center for Health Professions Education Research, which would fund peer-reviewed work on a national scale. We propose that 1% of money now being spent for GME be set aside for this purpose and feel that the return would far outweigh the investment.

3. Academic Development

As ambulatory care training and primary care continue to be emphasized, there is a real need for the concomitant academic development that assures that the field will not only survive but will flourish and attract students. This requires programs which support faculty and fellowships in the ambulatory and primary care fields. Examples include traditional general internal medicine fellowships, which emphasize ambulatory issues through health services research, and specific fellowships targeted at specific areas such as psychosocial medicine, primary care,

community health, and specific patient populations (e.g., HIV patients). For example, we have started a fellowship at my institution involving the primary care and consultative care of high-risk pregnant patients, which clearly meets a pressing need in our community (and perhaps many others as well). We need to think creatively about academic development in terms of future health care needs, and fund these kinds of fellowships fully for the PGY-4 and PGY-5 years.

4. Gap Between Medical School and Residency

Finally, I would like to comment on the gap between medical school and residency which I believe has grown to be too wide, too costly, and counterproductive. It makes little sense in this day and age to continue to treat these two components of a medical education as separate. Further, I contend that because residency is such a formative period in a young physician's life, many of the innovative changes we have started in medical school lose their impact when the former student becomes a resident where these innovations are no longer allowed to apply. It makes sense to integrate medical school and residency in a much more meaningful way, permitting increased education coherence, student tracking, and sustained career development. One proposal that has attracted some attention recently involves the combining of the fourth year of medical school with the first year of residency. Such ideas need further exploration and should be encouraged by this body.

SUMMARY RECOMMENDATIONS

- Fund residency programs directly
- Target funds for education research and development (1%)
- Support primary care/ambulatory care fellowships
- Convene panel to discuss gap between medical school and residency

In conclusion, because the challenges have never been greater, the opportunities have never been greater. I urge you to set a graduate medical education agenda which will respond to the new needs of our students and residents and, ultimately, our patients.

Michael J. Gordon, Ph.D.
Department of Family Medicine
University of Washington

FAMILY PRACTICE IN THE AMBULATORY SETTING

Good morning, Council members and guests:

By now it should be abundantly clear that the single greatest need in U.S. physician manpower is for more primary care physicians. They are the key to improving geographic distribution, to providing access for the underserved and to holding the line on health costs. For the future, a large primary care cadre will be essential to any rational system of health care that the nation may devise.

Let me emphasize that training for ambulatory care and for primary care are not the same. Primary care's defining characteristic is accepting responsibility to manage the health needs of individuals comprehensively over long periods of time, including the ability to orchestrate health care delivery in complicated circumstances.

The outpatient specialty clinics are not in the least prepared or interested in training students to build long-term commitments to people, to meet patients' needs comprehensively or to orchestrate complex health delivery plans. The urgent need for more primary care physicians cannot be met by pressing for more curricular emphasis in ambulatory specialty clinics.

I see four avenues for increasing primary care physicians:

- Improving access and selection favoring primary care--including student outreach, student recruitment and medical school admission policies.

- Improving primary care exposure and training opportunities--getting medical students out of the University Hospital and into the community settings where primary care is delivered.

- Improving student incentives toward primary care--incentives such as scholarships, loan forgiveness, and National Health Service Corps (NHSC).

- Improving incentives and controls in the health delivery system such as Resource Based-Relative Value Scale (RBRVS) and rules governing eligibility for Medicare funds for medical education.

My remarks will focus most directly on exposure and training for primary care, though the others are just as important.

I am going to assume that the Council agrees with the findings and recommendations of its own reports and is now looking for ways to bring primary care training into the mainstream of medical education—and thereby increase the numbers of primary care physicians to a level consistent with the nation's health needs.

I would like to describe for you the exposure and training efforts at the University of Washington to convince you of three things:

1. that the local primary care community surrounding most medical schools will develop the teaching capacity and long-term commitment needed to sustain a primary care curriculum.

2. that the quality of community-based primary care training programs will equal or surpass those of the academic medical center.

3. that exposure and training in primary care will substantially increase the percentages of students entering primary care careers.

Before presenting my evidence for these claims, allow me first to sketch the environment of the University of Washington School of Medicine.

We are a post-war medical school that has for the past 20 years consistently ranked among the top five public institutions in terms of extramural research funding. We occupy the second tier, just below the giants of biomedical research, and we aspire to the top rank.

The University of Washington School of Medicine also has a tradition of attending to community needs. In the early 70's this community commitment was extended to three neighboring states: Alaska, Idaho, and Montana (WAMI)—none of which had the resources to build a medical school. Through the WAMI program, 65 students per year from these states are admitted to the University of Washington. They spend their entire first year at their home state universities, where they take the same medical school courses and the same examinations as their classmates in Seattle. In the third and fourth years, our students take clinical clerkships in small town practices and city hospitals throughout the four WAMI states. The four-state partnership extends beyond medical student teaching to institutional funding, governance, administration and collaborative research.

Nineteen years of data now attest to the WAMI program's success in providing excellent education—both basic science and clinical—in multiple, distant sites. Also confirmed is the hypothesis that by taking students from small towns in rural states, and training them in outlying community sites, it is possible to stem the trend toward urban, sub-specialty careers. Contrary to early fears that such a program would dilute and weaken the school's drive toward preeminence in biomedical research, there is no credible voice for this opinion today.

My claim is that once a medical school decides to address the need for primary care, and core funding from local, state and federal sources is invested, then primary care training programs of sufficient capacity, long-term commitment, quality and influence will move forward vigorously.

I'll illustrate this claim with four training programs of the University of Washington Department of Family Medicine.

Example 1:

Introductory and intermediate preceptorships available to year 1 and 2 students during the academic year.

These preceptorships train first and second year students in the offices of local family physicians 1/2 day per week for one or more terms. The clinical experiences are augmented by seminars and skill-building workshops at the medical school. Over the past 15 years enrollment has varied greatly. When the intermediate three-term course offered a way to meet a physical diagnosis requirement, enrollment of second year students soared from 45 to 96. When the requirement was dropped and a dean advised students to stick to their science books and defer their clinical electives, enrollment plummeted to two students. Over the past 10 years enrollment has averaged 182 student quarters per year for 275 eligible students (2 of every 3 students).

Capacity and commitment:

We now have a bank of 150 family physician preceptors for these two preceptorships, 81 within 10 miles of the medical school. They have never failed us. We stopped paying them $25 per week in 1979. This is teaching enthusiasm, experience, and long term commitment on tap!

Quality:

Student ratings for both preceptorships compare favorably with the highest-rated of all of the 28 required core medical school courses of the first two years. The ratings are also higher than any of the six core clerkships of the third and fourth years.

Example 2:

A non-credit program to support students' aspirations to care for the underserved.

Some students still come to medical school with a desire to work with the less fortunate. They are a priceless resource whose commitment is eroded by their medical school experience. So, in 1980 a loose association between these students and a family physician faculty member was formalized to keep these aspirations alive. The Community Health Advancement Program, or CHAP, has since sponsored student-managed Saturday clinics at a Community Health Center in a public housing project. Students gain a positive perspective on caring for the poor that is very different from the turmoil of the inner city E.R., and the Saturday clinic hours are a boon to many working people in the housing project who lose wages for weekday clinic visits.

Capacity and commitment:

The student-run Clinic operates 40 Saturdays per year. It draws 345 student volunteers and depends on 30 physician volunteers per year. It has never had explicit external funding. Instead it has been run on meager funds bootlegged from other sources.

Quality:

As a largely student-run non-credit activity, formal evaluation has been sporadic. But it is common to hear students refer to the program as "my lifeline". Two thirds of the first year, second year and fourth year classes vote with their feet by signing up for Saturday volunteer work, and they have done so for 10 years.

Influence:

CHAP is a haven for students who feel estranged from their more self-absorbed classmates. One student remarked after a recent session, "It helps me remember that I don't have a personality conflict with all of medicine." In their residency applications, students describe their work in CHAP as having a formative or confirming influence on their career goals. Graduates who have been significantly involved in CHAP enter primary care careers preferentially, with plans to continue to work with underserved populations.

Example 3:

A training program in which students gain early experience in rural patient care.

Since the early 70's there have been repeated attempts by several groups in and out of the medical school to expose students to rural practice. Historically, two to five students per year have been enticed into summer rural experiences, with full reimbursement for travel and per diem expenses. The greatest obstacle has been the students' need to earn money over the summer. So the Washington Academy of Family Physicians offered stipends of $180 per week to top off travel and living costs previously offered through the AHECs. The Dean matched the stipend contribution and last summer 24 students spent an average of six weeks in rural practices. The student grapevine doubled the applicants for this summer: 52 students—one third of the first year class—lived and learned medicine in towns with a median population of less than 4000.

Capacity and commitment:

Teaching practices were nominated and screened by two independent community sources before being recruited. Virtually all accepted, exploding the common assumption that "no one would want these completely green students under foot." Within two years, 50 new unpaid preceptors were brought on to the teaching faculty from distant small communities.

To date, through this remarkable ad hoc collaboration among the Department of Family Medicine, Washington Academy of Family Physicians, its philanthropic Foundation, six AHECs,

and the Dean's Office, every interested student has received both a placement and full funding, though the program's exponential growth has been far beyond the scope originally envisioned by any of its sponsors.

Quality:

These preceptors and their practices were hand picked, and received an overwhelmingly strong evaluation from their students. Preliminary results from this summer's experience indicate an equally strong experience by 50 of 52 students, with the remaining two arranging satisfactory experiences after initial difficulties.

Influence:

All responding 1989 students stated that it had either increased their interest in rural practice or confirmed an existing interest in such a career. Again this year, the preliminary data from 52 students are showing the same strong reported influence and endorsement from students. As one student summed up:

"Growing up in a suburb of San Francisco, I had a lot of misconceptions about what rural life and rural medicine would be like.... I was very pleased to find that it was a lovely place to practice medicine, and I was touched by how appreciative the patients were. It made me much more open to the possibility of practicing in a rural area."

Sarah Hathaway,
Student at the Okanogan
Farmworkers Clinic
Omak, WA

Example 4:

A clinical clerkship conducted in 19 ambulatory sites distributed over the four WAMI states.

The family medicine clerkship began its 19-year evolution as an elective experience for 60 students per year. It is now a six-week requirement for all students and is offered in 19 ambulatory sites distributed across four states. Its capacity is approaching 200 students per year. Sites now include eight private practices, nine residency programs and two urban underserved clinics.

Capacity and commitment:

Four of the seven original practices are still teaching sites nineteen years later (Omak and Anacortes, Washington; Kalispell and Whitefish, Montana). At each expansion, the clerkship has recruited additional practices willing to train and supervise students full time for 40 weeks per year.

Quality:

For years the student grapevine held that the Family Medicine clerkship was the best of the core clerkships. Four years ago the Dean's office instituted an official evaluation system, confirming the earlier impressions. Since then, this clerkship has consistently led the remaining five in quality of teaching, appropriateness of patients, feedback and evaluation, clarity of the student's role, overall quality and its contribution to the students' education. This endorsement comes despite the strong reluctance of many students to leave their homes and families for six weeks in a strange town.

Influence:

It is well established that most students solidify their career choices in the third year of medical school, with clerkship experiences being the most influential factor in their decision-making. Our data tell the same story.

Like other schools, the numbers of students entering with primary care aspirations is declining and the number matching to primary care residencies follows suit. But for at least the past 15 years, UW students have chosen family practice residencies at twice the national average, most recently about 21 percent.

Is our level of commitment, quality and

influence a fluke. I don't believe so. Family physicians elsewhere have responded as well—in part because they have a vested interest in replacing themselves. They are outstanding teachers because they are mature professionals with a mentoring outlook. They are less frequently the harassed, sleep-deprived residents who staff the university hospital wards. Students enter the primary care realm in ones and twos, not in waves, and they receive personal attention. And critically important, primary care teachers have an edge in teaching students because they know their patients well.

In conclusion, I have one point to make.

Institutions rarely make fundamental, voluntary changes from within. But they can be made to budge through external leverage and accountability. Do not expect that howls from the public for more primary care doctors will influence medical school deans and department chairs. The flow of students toward remunerative, over-supplied sub-specialty careers will continue until the federal government changes the funding rules.

For many deans and chairs, the land beyond the teaching hospital is *terra incognita*. But if Congress insists that medical schools face the primary care obligations they would prefer to ignore, and if Congress provides its share of the resources, the primary care community will respond with commitment, its own resources, and quality training that will bring credit and friends to their institutions.

The University of Washington is not unusual in the response of its family physicians. It was somewhat unusual in inviting family physicians to participate nearly 20 years ago. Now it's time for other schools to try it, and it's time for the federal government to put its physician training support where the health payoff is greatest.

I have a list of 11 specific recommendations for the support of primary care training. I leave them for your consideration.

Thank you.

RECOMMENDATIONS FOR FEDERAL ACTION TO ADDRESS THE SHORTAGE OF PRIMARY CARE PHYSICIANS

Tie the medical schools' access to federal training funds to encouragement of graduates to enter primary care careers.

1. Every medical school seeking federal training funds should establish an academic unit whose major areas of teaching, scholarship and medical service are in primary care.

2. Every medical school eligible for federal training funds should include among its student admission committee members a minimum of 20% from primary care disciplines.

3. Every medical school eligible for federal training funds should make available elective curricular time and recruit clinically active primary care preceptors sufficient to enroll one quarter of its preclinical students for one term each year.

4. Every medical school eligible for federal training funds should require at least six weeks of primary care clerkship training with at least 75% of students completing the clerkship prior to January 1 of the final medical school year.

5. Medical schools that do not now meet these proposed eligibility criteria but wish to remain eligible for federal training funds may submit a proposal to meet them within five years. In this interim period, an approved plan and satisfactory annual progress toward its implementation will be sufficient to retain eligibility for federal training support.

6. Every medical school eligible for federal training funds should demonstrate

success in placing a minimum number of its graduates into primary care residency positions. The minimum numbers should be based on a formula that considers regional training resources, regional needs, and the success rates of comparable medical schools.

Clarify definitions of primary care and related terms.

7. Congress should establish unambiguous definitions for primary care, primary care training experiences and primary care-bound graduates.

8. Congress should establish unambiguous methods for counting primary care-bound graduates. Graduates who enter primary care residency programs where later sub-specialization is common may be counted as fractions, calculated on the proportion of the program's trainees who have sub-specialized historically.

9. Congress should identify all federal funding sources and programs included under the rubric "federal training funds" which are to be withheld from medical schools not meeting the primary care eligibility criteria. These sources should include Medicare funds for graduate and post-graduate training programs affiliated with the medical school.

Shifting funds for primary care training and leadership development.

10. Congress should provide sufficient moneys to adequately fund all worthy proposals aimed at meeting the primary care eligibility criteria, improving the quality of primary care training, and otherwise increasing the pool of primary care-bound physicians.

11. Congress should provide funds to train a new generation of leaders in academic primary care medicine, intended to enhance skills in leadership, academic administration, and scholarship.

Howard K. Rabinowitz, M.D.
Department of Family Medicine
Jefferson Medical College

FAMILY PRACTICE IN THE AMBULATORY SETTING

Thank you. I appreciate the opportunity to speak to the Council once again--this time about ambulatory care--an important issue in medical education and health care.

When I was here during the summer my colleague, Dr. Larry Culpepper, provided you with an excellent background as to why ambulatory care is so important. Dr. Gerald Perkoff provided a well written article in the NEJM - Ambulatory Care--an idea whose time has come. For some time we have been aware that the inpatient setting was not an ideal environment from an educational standpoint - Kerr White diagram (1961).

More recently, the inpatient area has become an even less appropriate setting secondary to financial changes. DRG's have decreased the number of hospitalizations, and shortened the Length of Stay (LOS). The hospital has become less than adequate as the sole location to learn medicine.

In fact, a major problem in medicine today (which impacts enormously on financial issues) is training doctors to practice inpatient medicine in the ambulatory setting. Overall, medical educators have achieved a remarkable consensus that more clinical medical education needs to take place in the ambulatory setting. So, why don't we do it? How can we do it?

You have already heard of a few excellent programs in Internal Medicine and Pediatrics. Unfortunately, there are not enough of these. Most Internal Medicine/Pediatric faculty are subspecialists and committed to teaching, patient care, and research in the inpatient area. Family Medicine may be ideally suited for this role. In fact, teaching ambulatory care may be the real niche for Family Medicine in the academic center.

Let me tell you about the model of teaching ambulatory care which we have developed in the Department of Family Medicine at Jefferson Medical College. Jefferson Medical College has had a required six-week Family Medicine clerkship since 1974, and over the past 16 years, over 3,000 third year Jefferson medical students (223 per year) have had over 400,000 patient encounters. This structured clerkship, one of the largest in the country, takes place in one of the seven residency based family practice centers, and is supplemented by a didactic curriculum, based on the active clinical involvement of student's caring for patients under full-time Family Medicine faculty supervision.

In 1974, Jefferson Medical College decided to make a strong commitment to the specialty of Family Medicine, and the Department of Family Medicine was begun. At the same time, a special successful Admissions Program for producing rural family physicians, which I spoke to you about in the summer, was instituted. In addition, a major curriculum change took place at the medical college allowing for a required six-week Family Medicine clerkship during the third year of medical school. The goals of this clerkship are: to teach the core principles of ambulatory care, to teach about the common problems seen in Family Medicine, to expose all medical students to the role of the family physicians.

This third year Family Medicine clerkship is based at the Thomas Jefferson University Hospital and six affiliated Family Medicine programs at Bryn Mawr Hospital, Chestnut Hill Hospital, Geisinger Medical Center, Latrobe Area Hospital, the Medical Center of Delaware, and the Underwood Memorial Hospital. Each site has an accredited three year Family Medicine Residency Program, and full-time faculty. Each six weeks, approximately 28 students participate in the clerkship. The average number of

students at each site ranges from 2 to 8, and the average faculty/student ratio ranges between 1 faculty and 2 to 4 students. The mean percent of teaching which is done by faculty is 70%, the remainder being done by 2nd and 3rd year residents and remember this faculty teaching takes place 6 to 8 hours per day. Using residency based family practice centers to teach medical students has allowed the utilization of full-time experienced and committed faculty in an educational setting and uses existing resources. Using only 7 sites has allowed for more consistency and structure in the educational and evaluation process, a difficult problem since as students move away from the academic health center, quality control and equality of experience are more difficult to achieve. For the residency programs, teaching medical students enhances the academic environment of their program, and provides more applicants and a higher fill rate for their residency program.

In addition, the Family Medicine clerkship has been designed as a structured learning experience. This core experience takes place in the third year of school, when students are learning their basic clinical skills and also choosing their future career specialty. The clerkship is scheduled as a six-week block rotation, which fits with the remainder of the traditional clinical schedule at Jefferson which is 12 weeks of Internal Medicine and 6 weeks each of Pediatrics, Obstetrics/Gynecology, Surgery and Psychiatry. Most of the learning takes place in the Family Practice Center with some additional time in private practitioners offices and the Emergency Room, as well as exposure to home visits, the in-hospital service, nursing homes, and other community social agencies.

The clerkship is also based on a didactic core of reading materials, conferences, audiovisual materials, and computer assisted instruction. This core content is based on the most common topics seen in Family Medicine. Since the clinical experience of each student differs slightly depending on their clerkship site, the didactic core represents a set of standardized materials. The reading list includes current articles and textbook chapters related to the topics, as do the formal conferences. Each student is required to keep a log book recording the patients they have seen, their age, sex, medical problems, and pertinent lab values. In addition, students are videotaped twice while taking a patient history, and this tape is then reviewed with the faculty.

Finally, the third year clerkship is experiential, with most students seeing between 100 to 150 patients per six week block. The students actively participate in patient care, seeing their patients in the office setting, doing a history and physical examination, forming a differential diagnosis and therapeutic plan. The students then present the patient to the faculty, decide what if any tests need to be performed, write prescriptions, if necessary, and they record their notes in a problem-oriented medical record format. They are responsible for follow-up visits that take place within the block and for reading about their patients' problems that evening. If patients are hospitalized, students are encouraged to follow their hospital course. This way students are being taught one-on-one by the faculty at the patient's side, with students seeing more types and numbers of patients than they see on any other rotation.

Evaluation of students takes place through the frequent daily observation of their performance. A mid-term evaluation takes place after three weeks in order to identify major concerns, and a final sit-down evaluation takes place with each student. Through yearly meetings with affiliate faculty, evaluations of students have become increasingly consistent among clerkship sites. In addition, evaluations have been appropriately critical, reserving the grade of high honors to the top 10% of students. In addition, a separate final examination in the format of a modified essay question is given. This MEQ was originally developed by the Royal College of General Practitioners in England for its general practice certifying examination and is felt to be a valid and reliable measure of evaluating primary care problem solving skills.

Evaluation of the clerkship has taken place in a

number of areas. The over 1,000 students who have evaluated the clerkship from 1983 to 1988 rated it significantly higher than any of the other core clerkships at Jefferson. In fact, one measure of the success of this clerkship is the fact that Jefferson students consider it as one of our "traditional" clerkships, and are amazed when they find out most schools do not have a required clerkship in Family Medicine. In addition, during the past 10 years, over 16% of Jefferson graduates have entered residency training in family Medicine, a rate of twice of all other U.S. private medical schools and twice that of all medical schools in the Northeastern United States.

Well, teaching students in the ambulatory setting obviously can be done. But what does it all cost? It is impossible to cost account ambulatory teaching exactly. But I will try to give you a rough estimate. In order to do this, I will make two assumptions. First faculty productivity is only approximately 50% when they see patients with third year students--not a very efficient process.

But remember that for each one dollar billed by a family physician, there is an additional one dollar billed by referring subspecialists, and an additional five dollars in hospital charges.

The second assumption is that the student teaching portion of the operation represents approximately one-half of our practice (the other half consists of residents and a few faculty who see patients without students).

This faculty/teaching portion of our practice brings in roughly $500,000 per year. This covers only about 45% of the 1.1 million dollar portion of the operation!

The rest of the money comes from the federal government (from health manpower training grants) approximately $50,000.

The medical college in the form of faculty salaries (approximately $200,000).

And the university hospital (to support the practice in the way of supplies, expenses, and non-professional personnel) approximately $350,000.

Considering that there are 223 students per year, this represents approximately $2,700 per year per student. Where can this money come from? There are obviously no easy answers.

This may come from increased tuition, increased federal training grants, or restructuring the current reimbursement system. Perkoff has suggested that clinical income in medical schools be considered as school income, rather than departmental income.

Whatever the source of income, I can tell you that ambulatory care training is critical for medical education, for health care, and for health care financing. After 14 years of running a successful model for teaching ambulatory care as a core component of the clinical curriculum of all medical students, I can tell you that to do it well--needs institutional commitment, committed faculty and significant financial resources.

Thank you.

Thomas L. Delbanco, M.D.
Beth Israel Hospital
Harvard Medical School

Respondent

I am grateful to be here, and I will try to keep you all awake. I received a telephone call from a colleague of mine, Dr. John Noble. He said "There is this lovely woman named Dona Harris who may call you to make a presentation. I hope you will want to do it. I am off to Paris. As an impecunious general internist, would you like to come and listen to a lot of smart people for a bunch of hours and then sum it all up and make recommendations?"--A daunting task. Nothing I have ever done before, and do it without slides?

It reminded me that there are certain advantages in not being staffed and having a chance to think ahead. And it reminded me of one of the better-known senators in Washington who some years ago was up for the stiffest re-election campaign of his life. He had a bad habit of mauling his staff, especially in times of stress. He hadn't learned much about faculty development and participative programs for employees, etc. Anyway, in his usual fashion, he said 48 hours before the fact, "Listen, I've got to give the best speech of my life to kick off the re-election campaign. Get with it, be ready, and I expect it on my desk a couple of minutes before I give the talk." And they said, "Yes, sir", as usual, and worked away.

He arrived in a good mood, faced his enormous audience and said, "Well, ladies and gentlemen, today I am going to do something rather unusual. I am going to solve three vexing problems. The first is this difficult issue of the defense business. You know, there are some who think we should make more nuclear bombs and have a ready arsenal so that we can bomb quickly, effectively, and surgically, if something happened, say, in the Near East. There are others who say the best defense is to make love, not war, talk to people, get rid of weapons, and come to a new agreement. I think I have something for you today that will bring both sides together. Then there is this thing they keep talking about, abortion. There are a lot of our citizens who believe that a woman's right to decide is God-given and should not be disturbed. And there are others who think that God had just as much intention for those whom those women are carrying, and that they should be able to emerge unscathed. I think I have something for you today that will bring both sides together. And then there's this tough thing about graduate medical education in ambulatory care. There are internists and family docs who don't talk, and there are internists and subspecialists who don't talk, and there are people who think they should spend more money on education when Bush is trying to balance the budget and figure out where $500 billion have gone. I think I have something that will bring them all together."

By now, he really had the audience on the edge of their seats. He turned the page and it said, "Now, you bastard, you are on your own."

So what I thought I would do this afternoon is discuss rusting Mercedes, making love to bandaids, and festering fomites, big bellies, green ties and red shirts, and see if that helps with recommendations to the Congress of the United States. I've made, as the Mikado said, a little list...

1. <u>The dumping syndrome.</u> I had the privilege in 1978 of working as a RWJ fellow on the Hill in the Congress. I worked for two of the most opposite extremes possible. One was a muckraking, left-wing congressional committee, and the other was Bob Dole, because I thought I'd like to see how both sides live. And I learned a lot. I learned about councils and commissions.

   One of the reasons for having a council or commission is that there are issues you don't want to face as a congressman, and the best way handle them is to put them

in Parklawn, the Institute of Medicine, or what have you, and let them debate it for the next five years. I don't know the genesis of COGME, but you're obviously exquisitely aware of that danger. When you come back to them, you've got to get their attention. You've got to make strategic choices. I would urge you to do that as recommendation number one. Go with what Dona asked us to do at the beginning today; go with a sense of excitement and take some chances.

When I held hearings, I flew in a big-bellied, green tie-wearing--it was a garish tie--and bright red-shirted family doctor from North Carolina to talk to the congressmen about the fact that he would get up in the middle of the night, drive an hour, save someone who was in pulmonary edema, and then go home. In those days Medicare paid him something like $17 for that. But if he put six sutures on someone who had cut him or herself with a little glass, they paid by the suture. Each suture then, I think, was worth about five bucks, and he got $30. The congressmen sat up there, and they watched him, and they said, "That doesn't make sense." And that, as far as I can see, was one of the early moments when the word "cognitive" versus "procedure" came into being.

They didn't use those words then; I was careful not to use them, but they began to understand the difference between a doctor's time and putting a tube somewhere or what have you. It was graphic, it was vivid, it was to the point. And now primary care and cognitive rolls off their lips like water. The important thing, I think, is to move to the next generation of truisms toward which they will hopefully put some cash.

Therefore, I urge that this report take some chances, even if you can't come to full consensus on them and then put out options, but don't make it just milk toast and thanks very much. The one thing that will happen if you do that is probably you'll get re-funded for another three years. If you take chances, you may not. But I urge you to be brave and really try and do something.

2. Apple pie. I am not going on the premise, as the panel just ended, that you'll get more money. I am going on the premise that you'll be lucky to have as much money going in this business as before. In fact, one of the discussions you better have is, "If we get as much money as before, how do we distribute it, and how do we handle the fact that we may get less?" Anyone who sits here and says that the pie is going to get bigger in this day and age is just hallucinating, and we should not be involved in a collective fantasy process.

   It remains difficult for our citizenry to grasp the fact that rationing is actually hitting America. I grew up in a bomb shelter in England. I understood that. It is in the British gut. It is not in the American gut. It's a hard thing to learn, but I think it's happening and we had better be aware of it here. There will be fewer dollars labelled "GME".

3. Go with the flow. There are a lot of good things happening right now. The good old days is the old family doc. Bring back the doctor. This nation really wants us to bring back the doctor. It is everywhere. We should take advantage of that fact.

4. The rusting Mercedes. Bill Hsiao, the AMA, and everyone is agreeing that doctors are paid too much to do certain things and too little to do other things. I don't think it's going to be a big convulsion. I don't think primary care docs are going to get anywhere near rich off this change, and I don't think that ophthalmologists are going to be driving VW's in

the near future. They may not get 560 SE's anymore; they may have to go down even to a 318 BMW. I am not sure what the limit will be. But you're not going to see such a change in the distribution of wealth among physicians. You're probably going to see them all making less money. But the rhetoric is out there. There's a general sense in this land that cognition is where we're going. This Council should ride with that, put it into your rhetoric, and make it very clear.

5. Tom's CV. Tom has been at the Harvard Medical School for 19 years, and he got a message from the Dean five years ago, "You're allowed to put the fact on your CV in the future that you teach." Now, that was a revolution. Before, I listed papers, and I listed a few administrative assignments. Implicit in the list was how many grants I brought in and what the overhead was with them. But there was nothing about teaching.

   Now we even have a track at the Harvard Medical School which can theoretically promote you to full professor with the same title as those who play with cell membranes. That's a revolution at Harvard. You've heard inklings of these revolutions all over the place. Again, go with that. Teaching is being explicitly recognized as something important. By the way, the faculty are shaking now about their evaluations of the students. I think as a result, they could be lousy teachers because they're going to spend all their time telling students exactly what they think the students want to hear so that they (the faculty) get an A so that they can get promoted. I think we had better watch out for that.

   But it may be a real change in the culture of academic medical centers. We should run with that.

6. Festering and fomites. Beds really are empty. And we don't have to give big speeches about the importance of ambulatory care, because my hospital is spending all its time thinking about it. Hospitals are expansile institutions; they get nervous if they don't change. And if they can't build more beds--and most of them can't--well, what are they going to do? They're going to do something in the outpatient setting, and today they're all doing it busily.

   We just bought a building on which we're going to spend millions of dollars to have it for patients who can still walk and talk. The hospitals have this fantasy, by the way, that primary care physicians are going to fill beds. They have never really grasped the fact that we spend all our time trying to keep people out of the hospital (a) because we think it's better for them, because they often get terribly sick in the hospital, and (b) because we're getting good at that. But let that fantasy reign supreme. I feed it as much as possible. Whenever I see my hospital president I tell him about the last patient I admitted. I never mention the five I kept out of the hospital. And he smiles at me and is going to lavish more resources on me as a result of that. So, again, we're going in the right direction there, and we should take advantage of it.

7. Viruses and the RRC's. My chairman got a call from the RRC for Internal Medicine about eight or nine years ago saying. "We're not going to approve your residency, Doctor Braunwald, because you've got too much time teaching in ambulatory settings." And Gene said, "What's going on here, Tom?" And I said, "Well, they're all mixed up." And he said, "Well, but they're powerful." I said, "Write them a letter saying, ` I'm Gene Braunwald; you can't do that to me!' That will be enough." And he did, and it worked.

But now they're back saying, "Well, do more of it." So the RRC's have been infected by this ambulatory virus, and again, we should move with it and run with it. So, I would caution you that we don't have to hold heads down and moan and groan all the time. We've a lot of things going in our direction, and the Council recommendations should reflect these things pithily, carefully. You should hire someone, with dollars that you no doubt don't have, who is a good public relations person and knows how to frame this report in ways that are zingy. You need bullets on it rather than long, laborious Germanic sentences. That will grab the people who read it. They will probably not get past the first two pages. Those two pages can have a lot on them that will really hit hard.

Let me offer two cautions, and then I'll get to a couple of suggestions. When I had to give a talk in 1973 at the AAMC, I reviewed the literature of the fifties and sixties about teaching in outpatient settings. The Commonwealth Fund funded a lot of programs in those distant years.

The history was that those who actually evaluated what happened in ambulatory teaching found that for every doctor who said, "Now I know exactly what I want to do," there was another who said, "Now I know exactly what I <u>don't</u> want to do." I would caution you about when we begin to teach residents who don't want particularly to be in outpatient settings or don't think they want to be. Rather than preaching to the converted, which we have been able to do in our residency programs, we're going to be preaching to the unconverted.

There's a real and present danger that we will solidify bias <u>against</u> what we do, rather than bring them into our field. We shouldn't do it too quickly, and if it be done, it had better be done well.

Now, there's a corollary to that. We're being asked to do everything. In my division, which has a tiny little practice with 30,000 visits, the Dean of the Harvard Medical School wants me to teach first-year students, second-year students, third-year students, fourth-year students, no longer as electives. The Chairman of Medicine would like me to have more and more blocks for his 100 residents. I want to preserve the primary care training program which we've had for a long time and which actually works. I can't do everything, and there's a great danger that I'll do everything very badly, become a dilettante. It is also not so easy to tell my dean or my chairman, "Go somewhere else, please."

The Harvard Community Health Plan, which serves 500,000 people, does less teaching than my colleagues do. So, one of the things you have to do is look at all these sites, as we've heard very nicely expounded upon today, and see how we can mobilize more teachers in many more settings. The core medical schools--and most of you know this full well--can't possibly handle the onslaught that's coming, and the danger is that we'll do it very badly, rather than say no. It's hard to say no.

8. <u>Opportunities</u>. Steve Wartman wasn't allowed to develop his thoughts about where graduate medical education dollars should go, partly because it sounds like you're all tired of talking about money. He posed some stimulating and important questions. Now, I am not an economist, but I had lunch with Joyce Kelly, Ph.D., in the audience from the AAMC, who is an economist. She gave me a quick tutorial, which I need periodically, about the difficulty of even beginning to think about all those dollars that are

hanging out there with that funny label called graduate medical education.

We all know they're a proxy for service in different ways. We know that in some way, they are, indeed, related to education. We know that Congress doesn't want to pay to educate someone who, on average, is going to make twice as much as he or she who is passing the bill does and five or ten times as much as the average American. So, if you let the graduate medical education dollars hang out there too nakedly, they'll just go zap, gone. If you fold them into indirect and direct and help for the underserved, targeting the inner city hospitals where academic health centers are, or the rural poor, then we get away with it for a long time with various strange accounting mechanisms.

If you look at my hospital, the dollars disappear into a great large pot, the beneficiary of which I am. Because if the pot is felt to be relatively full by the guy who runs the hospital, when Tom marches in demanding this, that, or another thing, he is apt to say, "Yes." If the pot is generally empty, he's apt to say, "No." Therefore, I am not sure that redirecting those dollars in an explicit way is going to make all that much difference, actually.

The notion of giving those dollars explicitly to me as a primary care program director, taking them away from potential urologists, let's say, and giving them to us who are primary care types is very attractive to Steve and me and the rest of us, but I am not sure it is so feasible or so important.

Joyce made the suggestion that maybe graduate medical education dollars should be more explicitly directed at faculty. That's an interesting notion that the AAMC is looking into and that the Council might consider. Is there a way of pushing those dollars into faculty support? I'm doing all this teaching, right? I'm in a soft money university in a hospital. Who's going to pay me to teach? Now, the chairman has to take money away from cardiac catheterizations. He only needs a few to cover my teaching costs, but he's going to have to re-allocate those resources. Would it be easier if the money came directly to those teachers?

9. Volunteerism. Mr. Reagan was not my favorite president, but there is today more interest in volunteerism in this land, and that's not so bad. If you think about the wonderful history of the WAMI program that we heard so eloquently displayed today, those docs out there are not doing it to make more money. Yes, some of them hope to get more people to practice with them in the future. Yes, some of them operate at least not at a loss, and maybe even make a profit off a senior resident.

   But basically they do it because they're good people. Good people go into medicine. We tend to forget that. They have virtuous motives. Most of them realize that there are easier ways to make a lot of money, if that's all that drives us. We're not income-maximizers. The economists shake their heads in disbelief at the way we behave in that respect.

   The Congress loves to hear about volunteerism. That is apple pie in the best sense of the word. Get together those success stories and make them part of your report. Think of ways of leveraging that warm and giving impulse in this land, so it becomes more. Think of disseminating WAMI from four states to 50 states. Think of disseminating the kind of things that some who teach in the inner city do.

   Think too of using patients as teachers. They're extraordinary teachers. We're

doing that now. Some patients, love to spend time with young doctors. They share the hope that those young doctors will grow up to be good doctors. Many of them worry that they won't. Many of them believe they can do something about making them better doctors.

Let's mobilize that. Let's bring in people whom we don't always have to pay, don't always think about dollars. Let's have suggestions from this Council that don't just hang on the dollars. Have programs that Congress can read about and say, "It's free and it's neat. Let's try it Let's see how we can do it." Give out awards. It doesn't have to be in dollars.

10. Grand mal seizures. Propose some big experiments. Propose some big changes, and then see what happens. For example, I happen to think you can train an internist by having him or her basically live with outpatients, with occasional forays onto the wards. Now, that is awful stuff for some of the professors. Most of us try to replicate ourselves. It's something we have to guard against. I will be glad if people do exactly what I did. Every one of us is like that. We're human. And the professors of medicine generally want to replicate themselves, and they're not at all married to ambulatory care.

    Let's try some big experiments that are really different, and see if they work or not. Let's have some seizures out there. Come up with a list. It won't be hard to do. Ask for them to be mounted, funded, what have you.

11. Making love to bandaids. There is a lot of money in the private sector that is not afraid of experimenting and isn't totally uninterested in education. Everybody likes leveraging money through partnerships. I suggest that the Council recommend that the United States Government and Johnson/MacArthur/Pew/Commonwealth/Kaiser/Macy/Kellogg/ slash/ slash/get together and explicitly mount an agenda to which each contributes. Between you and me, many of those foundations don't know how to spend their money. Their biggest worry is how to get rid of it every year. It is a worry because it isn't so easy to get good things to spend money on. It probably is as hard to give money away wisely, as to get it, and that's something we tend to forget. You could come up with some interesting things which mandate a public/private partnership--You know how nice that sounds? It is something you might urge explicitly as recommendations.

12. Success stories. Trumpet the successes. We heard some wonderful stories today. They don't have p values. But they're nice stories. Mount them properly; get them together. Short: one paragraph. Not an entire book. Get them out there as examples, as anecdotes of where we could go. There are wonderful things we hear about, and others don't know about them. The other thing it does is keep us from reinventing the wheel, a terrible hazard we all face. I was busily taking notes today to take home. "My God, why haven't we been doing that? Someone just around the corner is doing that. I never thought of that."

13. Ten biggies. That's my final comment. Think of ten very concrete, doable questions, things that you need to answer, and propose them. Can you think of an experiment in GME that can be done that would show X?"

    Put out ten things that will move people forward and ask the Congress for the resources to pursue them. What are the ten questions the congressmen are going to ask about? They want data and anecdotes. They'll ask for both. They didn't

> do a big study of end stage renal disease; they saw someone sitting in front of them with a dialysis machine hooked up, and then they changed the Medicare law. They listen to anecdotes as well as they do to data, but they need to see both. So you've got your success stories--that's anecdote. And then think about experiments, data-intensive experiments or questions that you can answer. So when those questions are posed, we don't have to look collectively blank, but can say, "Well, we thought of asking them, and in fact the Council did ask them. We got money from you to do it, and this is how much further we are."

Thanks, very much for allowing me to listen and ponder with you.

Resources

1. Gastel, B. and Rogers, D. E. (eds.). Clinical Education and the Doctor of Tomorrow: Proceedings of the Josiah Macy, Jr., Foundation National Seminar on Medical Education. The New York Academy of Medicine, New York, 1989.

2. New York State Council on Graduate Medical Education, First Annual Report, 1988.

3. Abrahamson, Stephen. Myths and Shibboleths in Medical Education. Teaching and Learning in Medicine, an International Journal, Vol. 1, No. 1, 1989: 4-9.

4. Academic Medicine: Proceedings from the Conference on Ambulatory Care and Education. Los Angeles, California, July 14-16, 1988, Vol. 64, No. 10, Supplement.

5. Barrows, H. S. and Peters, M. J. (eds). How to Begin Reforming the Medical Curriculum. An Invitational Conference. Sponsored by the Josiah Macy, Jr., Foundation and Southern Illinois University School of Medicine. Southern Illinois University School of Medicine, June 14-15, 1984.

6. Adapting Clinical Education to New Forms and Sites of Health Care Delivery. Proceedings of an Invitational Symposium. Association of American Medical Colleges, 1987.

7. Perkoff, G. T. Teaching Clinical Medicine in the Ambulatory Setting: An Idea Whose Time May Have Finally Come. New England Journal of Medicine. Vol. 314, No. 1., 1986: 27-31.

8. Bloom, Samuel W. Structure and Ideology in Medical Education. An Analysis of Resistance to Change. Journal of Health and Social Behavior. Vol. 29, 1988: 294-306.

9. Rabinowitz, Howard K. Evaluation of a Selective Medical School Admissions Policy to Increase the Number of Family Physicians in Rural and Underserved Areas. New England Journal of Medicine. Vol. 319, 1988: 480-486.

10. Physicians for the Twenty-First Century: The GPEP Report: Report of the Panel on the General Professional Education of the Physician and College Preparation for Medicine. Washington, D. C.: Association of the American Medical Colleges. 1984:5-25.

11. Rosenblatt, R. A. Current Successes in Medical Education Beyond the Bedside. Journal of General Internal Medicine, Supplement, 1988: S44-S61.

12. Schroeder, S. A. Expanding the Site of Clinical Education: Moving Beyond the Hospital Walls. Journal of General Internal Medicine, Supplement, 1988: S5-S14.

13. Federman, Daniel D. The Education of Medical Students: Sounds, Alarums, and Excursions. Academic Medicine, Vol. 65, 1991: 221-226.

Resources *(cont.)*

14. Petersdorf, Robert G. Three Easy Pieces. Academic Medicine, Vol. 65, 1990: 73-77.

15. Clawson, D. Kay. The Education of the Physician. Academic Medicine, Vol. 65, 1990: 84-88.

16. Tosteson, Daniel C. New Pathways in General Medical Education. New England Journal of Medicine, Vol. 322, 1990: 234-238.

17. Neufeld, V. R., Woodward, C. A. and MacLeod, S. M. The McMaster M.D. Program: A Case Study of Renewal in Medical Education. Academic Medicine, Vol. 64, 1989: 423-432.

18. Shine, Kenneth I. Innovations in Ambulatory-Care Education. New England Journal of Medicine, Vol. 314, 1986, 62-53.

19. Foreman, Spencer. Graduate Medical Education: Focus for Change. Academic Medicine, Vol. 65, 1990: 77-84.

20. Paccione, G. A., Cohen, E., and Schwartz, C. E. From Forms to Focus: A New Teaching Model in Ambulatory Medicine. Archives of Internal Medicine, Vol. 149, 1989: 2407-2411.

21. Sahler, O. J., Lysaught, J. P., Greenberg, L. W., Siegel, B. S., and Caplan, S. E. Educational Interventions: A Survey of Undergraduate Pediatric Education, Progress in the 1980's? AJDC, Vol. 142, 1988, 519-523.

22. Rabinowitz, Howard K. The Relationship Between Medical Student Career Choice and a Required Third-Year Family Practice Clerkship. Family Medicine, Vol. 20, 1988, 118-121.

23. Woolliscroft, J. O., and Schwenk, Thomas L. Teaching and Learning in the Ambulatory Setting. Academic Medicine, Vol. 64. 1989, 644-648.

24. Skeff, Kelley M., Enhancing Teaching Effectiveness and Vitality in the Ambulatory Setting. Journal of General Internal Medicine, Supplement,1988, S26-S33.

25. Halperin, Alan K., and Kaufman, Arthur. The Teachers, Ambulatory Medical Education: A reconsideration of Sites and Teachers. Journal of General Internal Medicine, Supplement, 1990: S35-S44.

26. Delbanco, Thomas L., and Calkins, David R., The Costs and Financing of Ambulatory Medical Education. Journal of General Internal Medicine, Supplement, 1988: S34-S43.

27. Study and Comparison of Transition of Medical Education Programs From Hospital Inpatient to Ambulatory Training Programs, Executive Summary, Nancy E. Seline, Contractor. Association of American Medical Colleges, Contract No. HRSA 240-86-0068: October, 1986 - November, 1987.

28. Pawlson, L. G., Schroeder, S. A., and Donaldson, M.S., Medical Student Instructional Costs in a Primary Care Clerkship. Journal of Medical Education, Vol. 54, 1979: 551-555.

29. Bentley, J. D., Knapp, R. M., and Petersdorf, R. G., Education in Ambulatory Care--Financing is One Piece of the Puzzle. New England Journal of Medicine, Vol. 320, 1989: 1531-1534.

*U.S. GOVERNMENT PRINTING OFFICE: 1991--517-025/48362

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Health Resources and Services Administration
Bureau of Health Professions
Division of Medicine

Pub.No. HRSA-P-DM-91-4