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PHILOSOPHY OF MEDICAL EDUCATION IN THE UNITED STATES

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In this article I would like to bring to your attention where we are in the U. S. in medical education. Maybe this will give you a chance to contrast that with where you are in your own thoughts and ideas.

First, I would like to review briefly the history of modern day medical education from about 1910 through 1984–1985 in the U. S. because we have been through several eras in this very, very short period of time. As you embark here in Pusan on a new medical school and you embark on becoming physicians and nurses and as part of the so-called health care team in this country and throughout the world, there are many, many changes going on that will impact on all of us. You will transcend some of the same things that most of us have transcended. And yet you will enter a world that is vastly different, when it comes to thinking about health care and the needs of the citizens of your own country and the world in the latter part of this century and certainly into the 21st century.

So if I can just review the revolution that happened in 1910 and 1911 in the U. S. that was known as the Flexnerian revolution. Dr. Abraham Flexner was not a physician nor a health educator. He was simply an educator. He was asked to visit all of the medial schools in the U. S. in the period from about 1909 to 1911, and to render a report to the country about the nature of medical education. After his tour throughout the country, he issued a report that was very critical. The report stated that physicians were really not very well educated in the U. S., that we didn't have an appreciation for scholarship, and that we were not preparing our students to be good scientists. Indeed, he found a majority of the medical schools were profit making medical schools and weren't really interested in whether or not the person who graduated was an outstanding dedicated servant to the profession of medicine but really was trying to get on with earning a living and doing whatever he had to do in order to be recognized as a doctor. He also found that very few, if any of the medical schools at that time, had a host university. Therefore the needed stimulation from other faculty and other sources of support weren't available to insure a well-rounded person and what we would nowadays regard as a well-rounded physician. That period, which is almost 75 years ago, was characterized by tremendous turmoil in the U. S. and by a whole change in attitude about the nature of a medical school. Many medical schools closed. The idea that a medical school either had to be part of a university or have as its component parts members who had a strong scholarly commitment and background in order to be accredited or approved was a major requirement. The report was so important that medical education suddenly became a very, very scientific field moving from what had been a humanistic field and one with a lot of art and care in it to one which those ingredients were important but the stress on learning and the stress

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on science and the stress in scholarship became greater and greater. It led to the lengthening of the training of physicians from a time frame of maybe 4–5 years post high school to one of as long as 12–14 years, because almost every medical student in the U.S. had to undergo 4 years of college preparation before they could be admitted to medical school. Then the medical school period was 4 years, and today the post medical school period for training to be a specialist is at least 3 years. and if you're going to be a surgeon, particularly a neurosurgeon, or orthopedic surgeon or a more super specialist type of physican, you could add 2 to 4 years more which then comes to a total of about 15 years post high school training. So this was a dramatic change in the idea about what a doctor is and was in America. It led to a curtailment of the number of schools and it led to a standardization across the country such that you couldn't tell from one medical school to the next the difference in what a doctor is or was. Even though we have schools spread from coast to coast and from border to broder, they are very, very similar in the way they do business, and in the proudct, the physician they turn out and the requirements that physicians must meet in order to practice medicine in the U.S.

The Flexnerian period went along from about 1910 to 1945. At the end of World War II there were about 60 medical schools. At that time most of the medical schools were private medical schools. By "private" I mean they were supported by a not-for-profit corporation and/or were church related. For instance Harvard, Yale, Columbia, Cornell, University of Chicago, Northwestern and Stanford are all what we call private medical schools. They have dominated the scene, in that they were the status medical schools and they were the schools that were so strong that they really conditioned the attitudes of the public about medical education. There were very, very few so-called public(or government) supported medical schools.

When the war ended the U.S. made a new commitment to medical education. The commitment was that the federal government was not going to go into the medical school business but rather it was going to support research throughout the nation in the medical schools. The goal of supporting this research endeavor was to eradicate those diseases that could be eradicated. So from 1945 until 1965 we saw the great explosion of scientific discovery and of the development of a scientific faculty in our medical schools. The amount of money that went to medical schools from the government for research was horrendous(or very great). In that period from 1945–65 we saw the investment pay off. It paid off in the development of a very, very good faculty, and in the sense of disciplines becoming very strong, so microbiology, immunology and fields like that, did not have a strong scientific basis at the end of the war, became very, very strong. Of course those fields then in turn contributed to the identification and discovery of how disease works and of how to eradicate many diseases, e.g. polio, diptheria, smallpox, etc., diseases that we rarely see any more in the U.S. Discoveries that led virtually in the U.S. at any rate to the eradication of rheumatic heart disease. So today there's no reason for a child in the U.S. to have rheumatic heart disease.

While we were making those advances, we failed to do two things. One our population was growing by leaps and bounds. We now have a population of about 230 million, but at the end of World War II the population was 110 million. So we have doubled our population since 1945. As the population doubled and as the discoveries increased, and of course solved many of our health problems, we failed to do two major things in medical education. One, we didn't expand the number of medical schools very greatly(60 medical

school in 1945, 80 medical schools in 1965) and also in 1945 we were graduating every year in the U.S. about 5000 doctors, and in 1965 we were graduating only 6500 doctors yearly. Needless to say, the society began to get restless. They were pleased that we were eradicating disease and that they wouldn't have infectious/diseases any more, but they were dissatisfied in that the number of medical schools which existed were mainly in the eastern U.S., and the number of physicians graduating was still not much greater than at the end of 1945-46. Many of the physicians graduating after 1945 were going into faculty positions and not into the field to serve people.

So in 1965 we saw the next development of the new area of medical education, namely, the demand by the U.S. society that we expand our medical schools. So from 1965-1985 we have gone from about 80 medical schools to currently 126 medical schools. Instead of graduating 6500 doctors a year, we now graduate about 15,000 doctors a year.

There were two other things that happened in 1965 that we should remember. The new social legislation for health care was developed which is called medi-caid (for the poor) and medicare (for the elderly). That was the first time the U.S., as a government, acknowledged that it should share in the funding of health care for the poor and elderly people. And that created greater demand for more services at a time when the output of physicians was not very great, and of course increased the social frustration with the medical education establishment.

Now the other thing that happened was that as we went from those 80 medical schools to 126 medical schools, the ratio of private medical schools to public medical schools reversed itself. So that today instead of being dominated by privately supported medical schools, the dominance is by government supported medical schools. But in contrast to many coutries, the government is not the federal government, it is the state government such as New York, Illinois, Ohio, Iowa, Oklahoma, etc. New of the 126 schools, 47 are private in nature. Since 1965 only 2 or 3 of the new medical schools have been private. Rush Medical College represents one new private medical school, as is Oral Roberts University in Tulsa, Oklahoma. Almost all of them have been publically supported. So now there are 47 privates and 79 public supported medical schools.

Why do I emphasize that change? I do it because as the American public said they are going to take care of the poor and elderly with health insurance provided through the government, and as we switch from a system which was basically privately dominated to one that is more publically dominated, we enter into a period where the society plays a greater and greater role in what they expect from the medical education enterprise. Therefore, what we call a "consumer movement" becomes more and more an important factor in what medical schools do. Thus it puts us into lots of conflicts because what we have done since 1945 is train a large number of well-educated energetic productive leaders in science, all of whom are committed to making sure that future physicians in the U.S. are well trained and well prepared and all of whom are dedicated to advancing the eradication of disease and understanding of disease on the one hand; then on the other hand we have a society which wants that to happen but at the same time is demanding more and more from us in terms of services. Let me put that in perspective. While we in the medical schools work hard to make sure that our physician students are very well trained and very well prepared to be both good humanistic physicians and good scientists, we of course are indoctrinating them with much information and many skills and many talents which are important to their well-being in their future. But at the same time we have a society which is saying, "we want more service at

less cost." Therefore, there is a conflict between what we as educators often see as important and what society sees as important.

In 1980 we entered into the next phase, I think, of our changes in medical education. That year with the advent of a new administration in Washington headed by President Reagan, the society made it known they were not as committed to under-writing the support of education of our physicians, nurses, and health professionals as they were before. And they made it clear that they wanted attention directed in new areas of service as well as the development of the scientific side of medicine. We are now in a period where the public role in funding education is changing rather dramatically. And where students for a long period of years didn't have to worry about getting money to become doctors, they now have to worry about getting money to become doctors. And not only that, they have to pay a lot of interest in order to get that money that they need to borrow to do the job.

At the same time we are in a period where the country has said that "technology development is very important, but we don't want all that technology to be in hospitals." Hospitals in the U.S are very, very expensive. So we live in a society where the goal of the next 10 years is to reduce the number of hospitals that are available to the citizens, or at least to make them much more informed that efficient in the sense of their utilization. I was the average stay of a patient in the Kosin Medical Center is 10 days. In the U. S. the average stay in the hospital is already less than 9 days and the goal is to get it down to about 6½ to 7 days. Now that may not mean a lot to study at that study of their train, but if one take the difference between 6 days and 9 days, that is a 30% reduction in the use of hospital feds and that means you have to get the volume use up or else the hospital will not make money in our society. It will lose money and go out of business. So we live in an era where the society, through its forces of government and private financing through insurance, is saying that they want good health care, but they want it done differently than it's being done now because it's too expensive. And for the future our physicians have to be trained to do more and more away from the hospital rather than more and more in the hospital. That may not seem very bad but the problem is that most of my generation has grown up in an atmosphere where most of the good deeds, the good care, have been performed around the hospital system. That is a very dramatic change in American medicine, and it means a very dramatic change in American medical education.

I have given that historical background to present where at least I see medical schools are having to go in developing a curriculum, its program, and its goals in the late 1980's and the 1990's if we are to stay competitive medically in the U.S. I think we will stay competitie. It is apparent that to be a good physician in the end of this century, we still have to have people that are very well educated. It's apparent that the quality of their education has to be better. not less, than in the period that most of us were trained, current faculty and current deans of medical schools. Therefore, we can't throw out the baby with the bath water so to speak. We have to see what is excess baggage, what are our priorities, and then we have to move forward to continue developing the quality of proudct we have always been proud of. That means that the time of medical education in the U.S. probably will not get shorter. It will probably stay at least in the time frame that it is at the present time, but it means that the types of preparation that students have for becoming doctors will gradually have to change to some degree over this next generation. So far instance, in the college preparation of students we still feel that it is very im-

portant that they have a broad, general education. A broad, general education means a good appreciation of history, humanities, and what they are about as individuals ("why am I, who am I, why is it that I think I want to serve humanity in this kind of way"). That is the opportunity the college presents to the student, and also the beginning of developement of those fundamentals in science so that when they get to medical school they can handle the material without having to start totally at the basement level. So that means they will have to continue learning a good deal of mathematics a good deal of physics, a good deal of biology, and a good deal of chemistry. But probably as we get towards the end of this century, they are going to have to switch a little bit from the formal model of college preparation to adding an appreciation of computer sciences. Probably we will need more mathematical preparation rather than less because mathematics is becoming such an important part of the modern technological age; and probably more and more of our students will have to develop and appreciation about technology in engineering because as we move into this next phase of development, it is clear that the technology part of medicine and the engineering part of medicine will become almost as important to the understanding of being a good physician as will being a good cell biologist, a good biochemist, a good pharmacist, etc. That is probably an area where we have not yet made the transition. That is probably coming, but it is going to come very quickly.

I have done some surveys of our own students to see whether I am right or wrong. I have done those surveys by asking them questions on questionnaires. And indeed, most of our students now come to medical school in Buffalo with at least one if not two computer sciences having been taken in their college years. Virtually all of our students come with at least two calculus courses. So the students know that the world is changing and medical education obviously has to be aware of it. We need to prepare them for the end of the century and not for 1985.

In the medical schoool itself we are under intense pressure to change and yet under pressure to maintain integrity of the profession. Of course every year our students want us to move faster at change than we are ready to move. But I am convinced that if we are to prepare the proper counting of physicians for the future, it is more important in 1985 not less important, that these students have a good foundation in what we call the pre-clinical sciences. Now I don't know how it is in Korea, but I can tell you how it is in Buffalo. If the first year student had his/her choice, he/ she would tell me, "it is time to get rid of anatomy; it's a course that had had its day." And they tell me it's too much to learn all those facts in biochemistry, physiology, and why do we need to know so much in histology, and neuroanatomy. Of course, the problem is that at that stage of their career they are probably correct. There is too much to learn. But the facts are, this is the only opportunity to learn it well. As we move into on era of a new kind of medicine in the western world and throughout the world, the good foundation in biochemistry, physiology, anatomy, cell biology, pharmacolgy, microbiology and immunology is going to be more important not less important. So there will be pressure from the students to change to a service modpl, there will be pressure from the schools to become more adroit and more intense in making sure that medical students are better educated for the future and not less well educated.

At the same time, the way in which medicine is going to be practiced will differ. Our biggest challenge is not going to be to change the preclinical curriculum. It is going to be to change the clinical curriculum because right now all of these 126 medical schools, in general, concentrate their clinical education at the bedside. We do

that because (1) it is the least expensive way to train the student; (2) there is more time for the student and patient to get to know one another; and (3) we can give better quality supervision to the student at the bedside. But if one thinks about the dilemma we are in, namely, that the patients will be staying in the hopsital for such a short time, and the opportunity for the student to learn as much from that patient as was once possible is disappearing. It is clear that we as medical educatiors in the U.S. have to move our educational models away, in large part though not totally, from the hospital setting. This means a tension and a stress on our faculty that has never existed before. Because our faulty has been able to ,live and work in these hospitals as well. It means we have to develop our research environment in a new environment contrasted with the hospital environment that we are not yet ready to accede to, we are not ready to do that. But it is clearly going to come.

We also have to add a new dimension to the students' attitude about education. They not only have to be serious scientists, not only have to be serious physicians in the sense of their concern about the well being of a patient and the patient's family and the society around that family, but for the first time they have to be seriously concerned about the resources they utilize in taking care of those patients. In the generation I grew up I didn't have to worry about that resource problem. There wasn't a lot said about whether I wasted money by doing too many tests in learning about a patient or a disease. There wasn't a lot said about whether I left the patient in the hospital for 12 days instead of 10 days. There wasn't lot said about whether I chose to take care of the patient in one way rather than another way. But now that we are concerned about the cost of care, it is apparent that our students, and the residents that they will become and ultimately the physicians they will become, will have to have a third dimension that they have never had before. It is because of this cost issue (this resource issue) that I believe strongly that the future physician has to be more grounded, not less, in understanding basic technology, what technology can do for medicine. The efficiency in medicine and the cost-saving in medicine is going to come through advances in the way we to our business-automation, computerization, new ways of diagnosising patients, new ways of taking care of patients in new environments. And those advance are not going to be just in the development of people, but in the technology that follows them. It is going to be many times more important that they understand the technology than that they understand the mechanisms that go into the advancing of technology. So I think that is a dimension.

Why has cost become such an issue for the American public? You know and I know that the U.S. is a very wealthy country. In fact we are the wealthiest as far as I can tell of countries except for maybe Brazil where they have not used their wealth very well from what I know. Why are we so worried about that issue of cost? Well, one reason we are worried about it is that in the U.S. at the present time twice as much of our gross national product (GNP) goes into health care as does any other western civilized country. So, for instance, we spend 12% of our GNP on health care, England, France, Germany, and Scandinavian countries spend only about 6%. Your countries probably are at 6% or lower—I don't know the exact figure, why is that a problem then? It seems that if you're in favor of good medical care and you're in favor of very well educated physicians and you're in favor of physicians being recognized for the service they give to humanity, why should a medical educator be concerned about health care cost? The reason is really not very complicated. It is the same reason we worry about how much it costs to develop an auto

in the U.S. or how much it costs to develop an auto in the U.S. or how much it costs to develop a nuclear energy plant in the U.S., or anything else that we develop. In order to be competitive on the world market we have to be able to provide our services at a price that is relatively no more expensive than somewhere else. Clearly, in our country if it costs twice as much to maintain the health of our citizens than it does in an European country, then our products, to which some of the costs of the health care are charged, are going to be more is expensive and then we won't able to sell them. Same true if we go eastward rather than westward. So really the underlying concern about the cost of the health care is not the issue that we could do a better job by putting more money into health care in the U.S. for our people. It is that we can actually price ourselves out of business because our products will not be competitive on the world market. So in the last analysis we are no different than any other country. We may be wealthy, we may have the best medicine than exists anywhere, we may have the best medical education system than exists anywhere in the world, but the point is : If the cost is greater than we can sustain in order to be worldly competitive, then we are in the same boat as everyone else is. So this issue about how we deliver our care, our concern about resources and cost of care is one that will stay with the medical education system for the rest of my life time and probably in the foreseeable future of the 21st century. In a way all those who are in education probably resent that we have to worry about resources and costs. But the facts are that in a world that is dependent on one another (one country dependent on another country for a given resource or a given helping hand) cost and resources become a prime and pivotal decision making point of view for all of us. Therefore, the biggest challenge to medical educators in this century in the U.S., and probably throughout the world is : How do we develop the best product, the best physician, and yet do it at a cost that everybody can afford? That is why our curriculum will eventually have to reflect that concern by not getting rid of the importance of learning as much as we need to learn but teaching more and more students of the future to take that knowledge to become more effective and more efficient physicians and to be able to priortize how we use our energies and our resources more effectively. I think that is the challenge we live in now. It is quite a contrast to the challenge of Dr. Flexner's day when none was worried about that aspect of health care, health care cost and cost of training doctors. But now we have seen the pendulum come full swing and it is clear that our curricula and our development of future physicians in the U.S. is dependent on training them to do a job better and more effectively and more efficiently than ever before.

Lastly, there is one other area of change that is still in the U.S. that is different. In 1965 only 2-3% of the physicians graduating from medical schools were women. And only about 5% of the graduates were other than white men. Since 1965 that has changed tremendously. Now about 35-40% of our graduates are women. And that will also have an influence on changing the nature of medical practice and care. In our country, which is about 15% minority (principally black and hispanic), only 1% of all physicians are black. It is clear that, in our country over the rest of this generation, particularly those medical schools that exist in big cities, regardless whether they are public or private, the social pressure to be responsive to educating more minority physicians will also be a problem that we face. That is one which I think we can deal with as our education system gears up for that problem. But it is clear that we have a whole segment of our population which is deprived of adequate representative medical care and that will also be a so-

cial issue that we face up to in developing our curriculum to address during the rest of this century.

With that as a background, I hope that you appreciate that in our school we see our job in the medical education curriculum as preparing a total physician, of insisting that each man and woman develops necessary skills and competencies as a scientist and the necessary human values of compassion, love and care to be a good person in a physician role before he/she graduates and gets his/her M. D. degree. I hope I have left you with the spirit that I do not see that changing in the years ahead. What I see changing is how with those skills and those competencies, that knowledge, we adapt in a different way to meet the needs of a changing society.