

SECOND GENERATION MEDICINE

By Michael Schwartz

Second generation medicine is based on prevention instead of curing. Whereas first generation medicine began with the writings of Hippocrates and was allowed to develop over generations, second generation medicine has come quickly as a response to system overload and thus must be complete with first generation prejudices which insist on more hardware to patch up a crumbling system (more doctors, hospitals, better drugs, heart lung machines, etc.).

First generation medicine is heavily print-oriented. Printed matter is arranged hierarchically and facilitates centralized control. The feedback system is very slow, and although the quantity of information known may be enormous, retrieval of this information (access) is a very tedious process which requires pyramiding of knowledge into high specialization. As a result of print technology, we have a very highly centralized and specialized structure (hospitals and medical centers staffed with very highly skilled specialists). The result of the slow print feedback process has biased medicine in that knowledge can only be applied after something has gone wrong. Careful study of intervention-after-crisis is then written up in journals and later compiled into textbooks.

The acceleration and expansion of medical information has resulted not only in throw-away journals, but throw-away textbooks (try to sell a used medical textbook sometime!) Doctors now cluster in centralized structures so that they can "keep up" with their own specialties and have their flanks protected by other specialists. Urban ghettos and rural areas suffer most because of the former's overwhelming needs and the latter's decentralized locations. These groups have tried to obtain traditional medicine by the use of financial incentives and by outright takeover of medical facilities such as occurred at the Lincoln Hospital in the South Bronx, New York. This overlooked the fact that what is needed is access to health information pertaining to the South Bronx and not merely control of an institution which treats disease. Through the use of newer communications technology, systems which meet the demands for comprehensive, equitably controlled health care can be established.

Therefore, prior to 1970, there were two basic strategies to meet the health needs of America. One was to beef up the present system and the other was the medical radicals' attempt to take over the system.

In 1970, however, E. Grey Diamond drafted: "The open medical school, a community of scholars—the academic plan for the school of medicine, University of Missouri at Kansas City." In it, he correctly viewed the present crisis as one not of hardware or political control. The result is a plan for a new medical system which will stress decentralizing communications tools (newer technologies, such as computers and video).

What is the Kansas City Plan?

In 1969, the Missouri State Legislature appropriated initial planning funds for a new medical school in Kansas City, Missouri, in association with the University of Missouri at Kansas City. The location is on a 135 acre hospital hill which will con-

tain the buildings of the University of Missouri at Kansas City Dental School, Children's Mercy Hospital, the existing Kansas City General Hospital, a major acute psychiatric center, a mental retardation center, and a model extended care facility. The first-year class, which began in September, 1971, includes 40 first-year students, 18 second-year students, and 30 students in the third and advanced years. The curriculum is designed to achieve a number of goals: a) to individualize the education process for medical students by providing continual contact between scholars at all levels and by facilitating the access of these scholars to all necessary sources of information; b) to educate the students in a prototype setting of future offices and practice relationships; c) to develop a model university-community cooperation, where each component provides both programs of special concern and interest to it; and d) to provide the student with a relevant clinical and basic science model with which he can identify and to which he can aspire.

The educational plan consists of a six-year program coordinating two pre-medical and four medical years. The first two years consist of about 75% of the course work in the arts and sciences and the remainder in medical studies. During the final four years, the student will devote about 75% of his time to medicine and patient care, with the remainder set aside for liberal arts courses. Beginning with the third year, the students are divided into docent units. Each docent, a practicing physician who serves as teacher and counselor throughout the student's remaining four years, will be responsible for 12 students—three from each of the last four classes. At the end of the student's sixth year, he will receive an M.D. degree. The basic sciences will be available from all university disciplines with few, if any, departments created. The clinical specialty disciplines as such, will be available in the ten affiliated hospitals but their departmental organization will be responsible to that hospital, rather than to the curriculum per se. The student's space for operations will be in the medical school setting containing his office, those of his fellow students and a docent team. He will constantly operate out of this area, but it will remain his base of operations. Student clinical experience will be accomplished by a twelve-week rotation each year on a 20-bed general medical service, plus a continuing year round,

Aspirin can cause stomach upset!



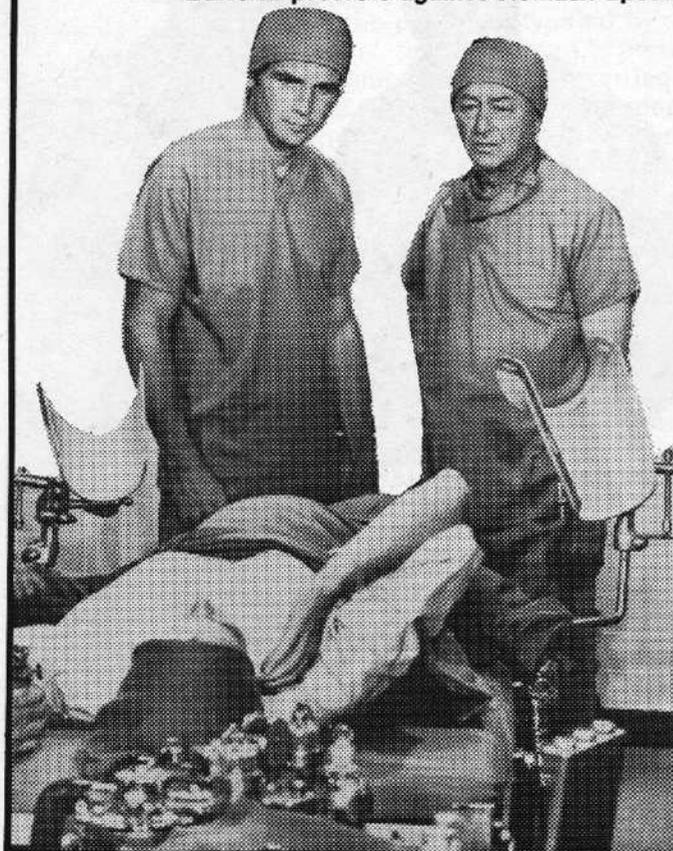
four-year responsibility for out-patient follow-up visits. During these four years of the program, the student will maintain out-patient responsibility for the patients first met during his twelve weeks general medical service. He will schedule these patients, and maintain office hours as needed, to give professional services to his "practice". The evaluation of factual information acquired as students will be done on a challenged exam system. The student will be allowed to progress to more advanced responsibility on an individual basis in accord with his ability to perform both factually and clinically.

Information Resources

"Every known and approved method of communication will be utilized to make available to the student-practitioner (at whatever level of education) all needed information, on an individualized and immediately available basis. Included are such techniques as the "briefcase computerized library", electronic video recordings, closed circuit television consultations, "dial-a-consult", computerized fact banks, simulation models, educational games, didactors, medical records adapted for case history study base, and similar new information devices. The system will be designed to take advantage of the newest communications devices and place a premium upon their incorporation into the program." To accomplish the goal of a better health care delivery system, E. Grey Diamond states in his conclusion, "that the University of Missouri will not hesitate to modify, alter, or change this program in part or completely, reverting to the classic structure, if that is the proper choice."

As the first major proponent of second generation medicine, indeed, major modifications will occur. A contradiction exists in wedding the centralized structure of print-oriented disease-centered classical medicine to the newer communications technologies which are inherently decentralized and prevention-oriented. They certainly can and must act synergistically, but they must be recognized as two separate processes, each with its own vehicle of action. Thus, the internal combustion engine

Burrerln protects against stomach upset!



was not strapped on the back of a horse, nor is the electric light bulb designed to look like a candle, although both of the former are used in transportation and both of the latter are used in providing light.

Planning a building to contain 35 separate computer terminals and 35 separate video systems to deal with a community's health problem is equivalent of putting all of the community's telephones in one building. In other words, you can't simply put "every known and approved method of communications" in the context of the older print technology. The health students office, completed with computer link and video system, should be placed at 35 locations in the Kansas City areas with the highest incidence of health problems (health wards). Actually, since second generation medicine does not operate by palliation but by prevention, the system can begin with one or very few community locations and then expand with new but basically similar health stations manned by graduates of the first, together with health students from the newer community. The student would begin by functioning as a sort of computerized bare foot doctor (first line medical worker in rural China) doing door-to-door health screening, prenatal and well child care, dispensing information on nutrition, physical fitness and drug abuse. The student may or may not want to "advance" to the treatment of illnesses in the community. Persons from a health ward that had to enter the hospital could be followed (treated) by his community student doctor in person or via video monitor. This, of course, would be supervised by community docents and hospital-based specialists. When a person must be hospitalized, his previous history and previous physical findings are available from stored computerized data. This data contains longitudinal information of his history and latitudinal information about his community. Complex medical problems seen in a community health clinic can be immediately attended to by a video medical consultant, on call for his specialty to that clinic. Neither patient nor physician will have to be delayed by travel time.

Freshmen medical students at Northwestern University are working on their own time with the Pedro Albizu Campos Free Clinic in a Puerto Rican area of Chicago, in an out-reach health program. They leaflet a block of apartments announcing that they will be on the block on a given Saturday morning, then seven teams of community workers and medical students go door-to-door and do screenings for anemia, lead poisoning, sickle cell disease, urine testing as well as obtaining a basic medical history, including physical measurements. There is an unlimited amount of services that a home health care system can establish. The students feel that this approach gives them an understanding of community health problems and renders a service to the community.

Contrast this to the attitudes of a very short time ago. Four years ago, a friend of mine was a sophomore medical student at the University of Illinois in Chicago. She lived in a dormitory with many nursing students. The women she lived with would approach her with problems of birth control, hygiene, etc. My friend felt (rightfully!) that responding to the health needs of her community (dormitory) would distract her medical education—atomy, biochemistry, pathology. It is now patently evident that one must approach the patient, not only as an anatomical, biochemical individual, but as a member of his geographic and demographic community. Training medical students on hospital wards, a context isolated from the patients' total living environment, makes it difficult later for students to function effectively in that patient's neighborhood (not until they are sufficiently debriefed). The student is just not oriented to think of himself as functioning in the community.

The goals of second generation medicine are different, but complementary to those of first generation medicine. First generation medicine, being essentially centralized and special-

ized, has placed high priority on heart, stroke and cancer—problems that are best dealt with in a regionalized manner—therefore, we have regionalized heart, strokes and cancer centers. Second generation medicine, being essentially community and prevention oriented, will have goals of conquering communicable diseases (TB, VD), decreasing infant and maternal mortality and morbidity, aiding in family planning, genetic counselling, drug problems and nutritional problems.

Similarly, first generation medicine has made hospital delivery of babies almost universally accepted to the extent that in the United States, only one home delivery service now exists—The Chicago Maternity City. Originally founded to serve wealthy “Gold Coast” women in Chicago, the Maternity Center services now go to only poor ghetto families and a few “radical” women. By basing the practicing health student in a neighborhood, and by giving good prenatal care, the home delivery of babies can again become community experience. This may lessen the risk of hospital-borne infections by highly resistant strains of bacteria. The incidence of maternal blood clot formation may also be reduced. Instead of starting off life in a newborn nursery, a child would begin in his home with family and friends.

A new medical format will define its own practitioner. Since the new style doctor will function mainly in the community, he will probably be selected or at least represent that community. The traditional paternal doctor role will be changed and probably will result in a preponderance of women practitioners. The work week will be shortened as a function of less demands upon the individual health worker.

This article has been an attempt to analyze the coming second generation of medicine (health care) with an attempt at feed forward. The important message is not that medicine will take the shape as envisioned here, but that we must see it as a process resulting from the technology available. The following illustrates how new tools may be used to reshape health care.

The impact of the discovery and development of anesthetics in providing the basic technology necessary for the expansion of surgery has recently had a parallel in the field of preventive medicine and it almost went unnoticed. In August, 1969, at the Woodstock rock festival, several unknown persons with portable one-half inch video cameras, went to the makeshift general hospital and taped the ongoing care of acute illness—drug reactions, cut feet, dysentery, etc. and interviewed both doctors and patients. They then went (according to one source) to various locations in the community of 200,000 persons and played back the tapes, thus providing rapid health information feedback to persons who could then act to modify further problems of this type. Enlarging on this system, one could anticipate setting up a continuous, instantaneous feedback process. This could be mediated by a professional health ombudsman, much as a professional football game on TV is moderated. The delayed process of putting medical information into print to be interpreted by health professionals for the benefit of the community is thus circumscribed. Many more medical uses of the new technologies will be discovered as these tools are made available.

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