

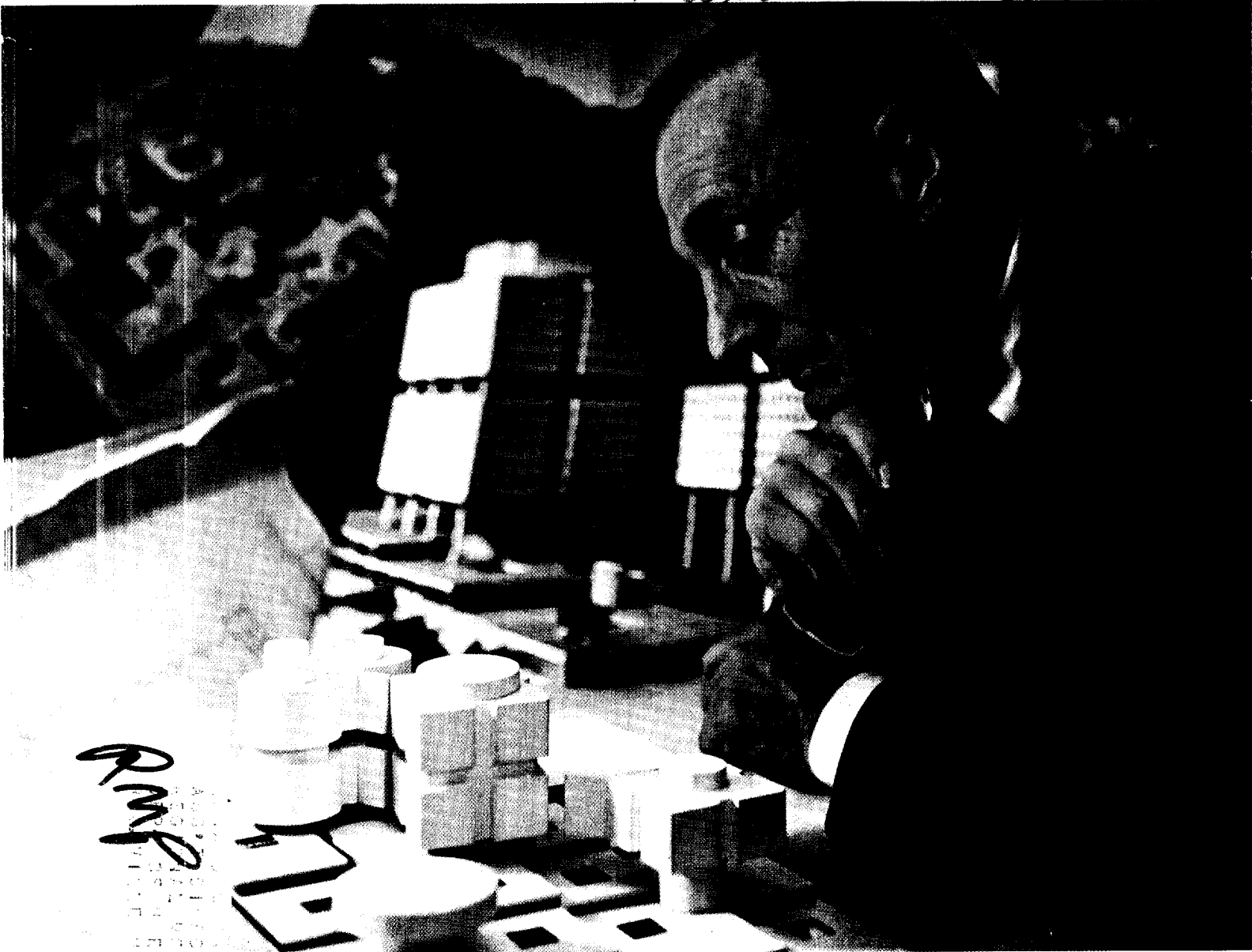


E001325

October 4, 1971

Modern Medicine

Medical Education



DR. EDMUND D. PELLEGRINO

see Contemporaries page 18

RNF
 ASSOCIATION
 OF MEDICAL
 PROGRAMS
 SERV

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Contemporaries

Edmund D. Pellegrino, M.D.

■ Plato believed that to be a good physician one must experience serious illness. In 1950, seven years out of New York University College of Medicine and with a foot on the first rung of the research ladder, internist Edmund D. Pellegrino was stricken with tuberculosis. A year and a half of bed rest, followed by a like amount of time as supervising TB physician at Homer Folks Tuberculosis Hospital in upstate Oneonta, N.Y., greatly influenced his career.

Recuperation gave Dr. Pellegrino time to "cogitate my way back to health." And working in rural Oneonta rekindled memories of two post-World War II years as an Air Force medical officer in Montgomery, Ala.

"I was educated in the classical tradition, headed for a classical role in research and teaching. But my experiences changed all that. In Alabama, I came face to face with some of the medical problems of rural America—the deficiencies in manpower, the lack of adequate facilities. In Oneonta, many of the same needs existed. I became convinced that one of the major areas of concern should be health care, and that education should be more closely related to meeting the needs of the community."

The New Jersey-born boy raised in Brooklyn knew that this was what he wanted to do—work to help meet these needs. And he has been doing it ever since during a medical career that has taken him to three pioneering

campuses in less than twenty years. He has been bringing his own brand of "relevance" to medicine.

Dr. Pellegrino went from Oneonta to then-little-known Hunterdon Medical Center in Flemington, N.J.; to the University of Kentucky College of Medicine (in 1959) when "it was a cornfield in search of a campus"; and about six years ago to the State University of New York at Stony Brook where he holds down three jobs simultaneously: director of the Health Sciences Center, university vice-president for the Health Sciences, and dean of the School of Medicine.

In each post, he has left his personal brand of innovation. Unlike some who often pose problems, then leave the solutions to others, he frequently casts off the yoke of tradition and challenges the long-established educational assumptions to find new ways of doing an old-fashioned job: turning out good physicians.

Dr. Pellegrino is impatient to finish one job so he can move on to the next. "It's part of my philosophy," he explains. "One shouldn't spend the bulk of his life in a single endeavor. One ought not to spend his time too long in one administrative post. You don't grow that way. If you can't make a major impact in seven to ten years, you're not going to make it. For the good of yourself and everybody else, you ought to move on to something else."

When you move, leave a bit of yourself behind. "That's the real test of an idea," he says. "Does it remain after you're gone? I'll



leave Stony Brook eventually, but I hope that if and when I leave Stony Brook, I shall have brought the right people together and have created an atmosphere so the major ideas can go on successfully. This is my test of whether the things I've done have genuine validity."

The trail that led to Stony Brook began at Hunterdon, where Dr. Pellegrino began as director of internal medicine and later moved up to medical director. Hunterdon was not well known then, but it was where he wanted to be. Hunterdon had a goal: to develop a comprehensive health care plan for this rural-agricultural community of some 42,000.

"It was the most exciting, most

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Indications: Gout and gouty arthritis except a presenting acute attack. However, if an acute attack is precipitated during therapy the drug should be continued without changing the dosage, and additional colchicine should be given to control the acute attack.

Contraindications: Hypersensitivity. Not recommended in persons with blood dyscrasias or uric acid kidney stones.

Warnings: In rare instances, hematuria, renal colic, and costovertebral pain have been reported. May precipitate an acute attack of gout; theoretically, may favor urate stone formation, which may be prevented by alkalization of urine and liberal fluid intake. When alkali is given, acid-base balance should be watched. Salicylates should not be given with probenecid, since coadministration results in inhibition of the uricosuric activity of the latter. Cell division in animals and plants can be arrested by colchicine. In certain species of animal under certain conditions colchicine has produced teratogenic effects and has adversely affected spermatogenesis. Such effects have not been demonstrated in humans.

Precautions: Hypersensitivity may occur, especially with intermittent use, requiring cessation of therapy or dosage reduction. Since probenecid raises plasma level of conjugated sulfa drugs, plasma concentrations should be checked occasionally during prolonged coadministration with sulfa drugs. A reducing substance, which disappears with discontinuance of therapy, may appear in the urine, giving a false-positive Benedict's test.

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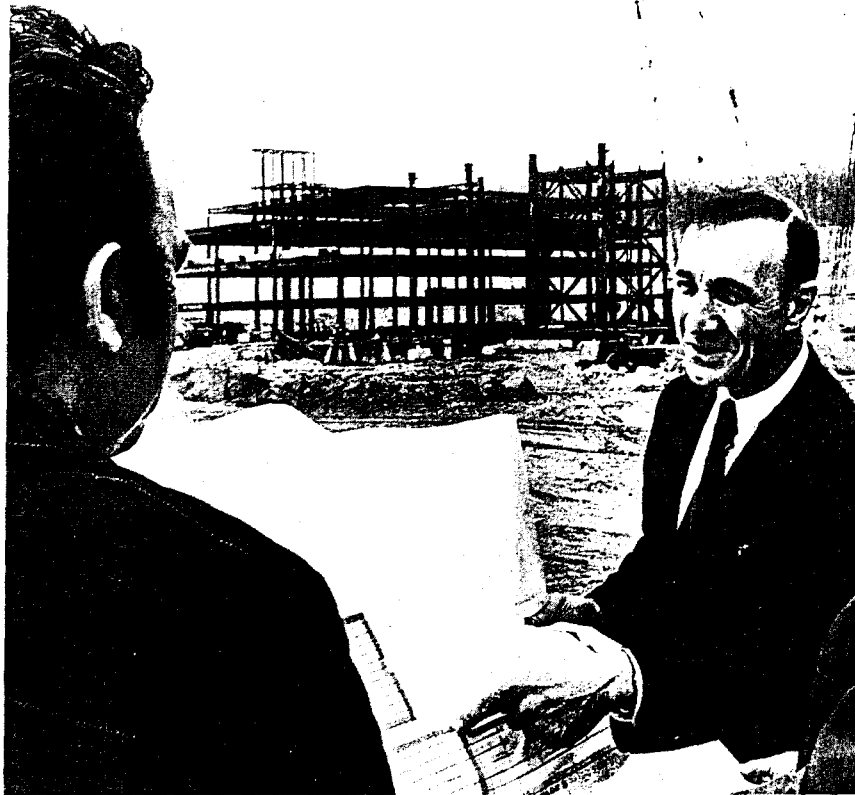
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WHERE TODAY'S THEORY IS TOMORROW'S THERAPY

ColBENEMID for gout and the pain of gout



rewarding part of my career," he says. "It was there where I had my first insight into a key problem in medicine's relationship to society: the need for congruence between what a physician does and what society expects of him."

The grass-roots movement to establish the center, initiated in 1948, had just begun to take shape when he arrived. Launched by a unique group of citizens—poultry and dairy farmers, businessmen, industrialists, and community leaders—it had the support of the county medical society and had gained affiliation with NYU Bellevue Medical Center some 70 miles east. And it had been guided during its formative stages by none less than Dr. Raymond E. Trussel, now

head of Columbia University School of Public Health and Administrative Medicine.

For Ed Pellegrino, Hunterdon "presented me with a fresh piece of canvas and a possibility of painting something personal, new and relevant." There, he had an opportunity to practice clinical medicine, but much more. He was able to help fashion a comprehensive health care program in a slice of rural America.

At Hunterdon, Dr. Pellegrino developed what was probably one of the first comprehensive health centers at a community hospital. Its staff practiced community medicine in a day before that now-commonplace function even had a name. And deeply ingrained with this service was a philosophy



long espoused by the medical innovator: that the many health disciplines must work together for the betterment of the patient.

Dr. Pellegrino believes, also, that the community should be an integral part of a medical center, that "those who participate in patient care at a community level should be brought together in action and purpose." Hunterdon provided office space and facilities for such agencies as the visiting nurse and homemaking services, the mental health association, and the community services committee.

Unlike many hospitals where general practitioners are denied staff rights and must turn their patients over at the door, at Hunterdon every GP in good

Contemporaries

standing with his medical society belongs to the attending staff. This fits into the Pellegrino pattern: the GP, or family physician as he prefers to call him, should be a coordinator of care. A system initiated by Dr. Pellegrino placed the GP in just that role. Patients are admitted and cared for by the GP who has privileges on the medical, pediatric, and obstetric staffs. Major surgery is performed only by the full-time staff. But the GP remains the responsible agent. He admits and discharges, writes orders, and coordinates care.

Another Pellegrino innovation: at Hunterdon there are no "clinic days" or "service patients." Whether they pay or not, they're all seen under the same conditions and their care is the same. Each has an attending physician responsible for his care.

Hunterdon, Dr. Pellegrino believes, demonstrates the basic principles "worthy of consideration in part, if not in toto," by all communities planning health centers. And he took a bit of Hunterdon with him to the Kentucky cornfield that became a medical school.

The 50-year-old physician admits, in retrospect, that he was an unlikely choice for the post of chairman of the department of medicine. "I had deviated from the established pattern," he says. "My research background, as a result of my bout of TB, had suffered. But I fitted into Kentucky's notion that significant changes in medical education were urgently needed. We came into a sympathetic congruence—that doctors were not meeting all the needs of the people; that

they were not as responsive to the health needs of society as they might be."

When he arrived in Kentucky, medicine was faced by critical educational issues: how to relate a health science center to the people it served; the need to introduce behavioral and social sciences into the health sciences; a way of achieving a balance between science and a more humanistic patient-oriented outlook; seeking answers to the question, what more can be done in the field of community medicine?

"Here," he says, "I could grapple with these problems at their earliest stages. As professor and chairman, I was part of a core planning group under Dr. William R. Willard, dean of medicine. I was an unofficial 'idea man'—a dean without portfolio."

Working "from Ground Zero," he, along with the group Dr. Willard had assembled, was able to build a faculty that combined basic and fundamental clinical research with a concern for patient care and general internal medicine.

There were the myriad but more routine chores in building a faculty and curriculum, of course. But these were not enough to satisfy a restless man. Dr. Pellegrino was elected to the Executive Council of the University Senate and then to its chairmanship. And it was in that post that he became involved in a revision of the academic plan for the entire university.

At Kentucky, he was instrumental in developing one of the first comprehensive drug information centers, expanding the functions of the pharmacist at

the university hospital, initiating one of the country's first physicians' assistants programs, implementing ways to improve relationships between doctors, social workers, and nurses. And what he personally feels is significant, his department of medicine became one of the first in the country to appoint two general practitioners to its full-time faculty. Under the aegis of the department, the school developed programs for the teaching of physical therapists, dietitians, and medical assistants. Out of this embryo grew the School of Health Professions which exists at Kentucky today.

At Kentucky, Dr. Pellegrino applied much of what he had preached and practiced at Hunterdon. It was there, too, where he laid the groundwork for concepts he was later to apply at Stony Brook. It was also while at Kentucky that the Pellegrino philosophy began to appear in print in an endless flow of ideas. He considers himself almost as much a philosopher as a physician. He is as deeply concerned with the needs of society as he is with those of individuals he ministered to as a clinician. These views, drawn from his writings and commentaries, give insight into the philosophy of the man:

Medical ethics: "Societal and individual values are increasingly counterpoised in almost every medical act. Some rational and just order must be established between these values to ensure the good of society while safeguarding the traditional rights of the person."

Relevance: "Medicine is an instrument of social purpose. It

Continued on page 29

doesn't exist as an intellectual discipline, but only because society has certain problems. Unless we address ourselves to the resolution of those problems, we're not fulfilling our responsibilities as physicians."

Humanity: "The most delicate of the physician's responsibilities, protection of the patient's welfare, must be fulfilled in a new and complicated context. It is the physician's responsibility to see that group assessment and management are rational, safe and personalized. He must guard against the dehumanization so easily and inadvertently perpetrated by a group in the name of efficiency."

Competence: "Maintenance of competence [is] a prime ethical challenge. Only the highest standard of initial and continuing professional proficiency is acceptable in a technological world. This imperative is now so essential a feature of the patient-physician transaction that the ancient mandate, 'Do no harm,' must be supplemented by, 'Do all things essential to optimal solutions of the patient's problem.'"

Philosophy: "The major concern of contemporary philosophy is man's existence, and it is here a dialogue fruitful to the physician can begin. The functions of the physician and the philosopher are not to be confused. The doctor proceeds by hypothesis . . . the philosopher clarifies and augments the concept, puts it in relation to the general history of ideas, and raises the fundamental questions of ends and values. The relation of the two disciplines is not one of subordination, but one of interpenetration."

In 1966, Dr. Pellegrino brought this philosophy with him to Stony Brook. "This," he enthuses, waving an arm to the campus outside his window, "was an opportunity to take my ideas and apply them to a total new comprehensive health sciences center.

"One of the major deterrents in the delivery of optimal health care," he believes, "is the failure of communications and lack of precise definition of functions among health professions. Characteristically, they carry out educational functions in isolation. It's essential that they develop them in close cooperation from the outset."

This is what is happening at Stony Brook. He has organized the center so that the deans of the colleges—Medicine, Nursing, Dentistry, Social Welfare, Allied Health Professions, and Basic Health Sciences—and the director of the University Hospital participate as equals in policy-making.

He hopes to reexamine the "assumption that the basic sciences as now taught make for better medical practice."

"We must concentrate on the introduction of the language of basic science," he says, "with a later concentration on those basic sciences most relative to the field or practice chosen by the student. In essence, the basic science component will vary with the track the student chooses to follow."

At Stony Brook, he hopes eventually to turn out physicians exquisitely competent in a particular area but not in the whole scope of medicine. They would

earn "parenthetical degrees" and on the diploma, as well as the license, the M.D. would be followed by the specialty.

A primary goal will be to produce more physicians able to provide primary, preventive, and emergency care—what he believes is the major unmet health care need in the country today.

As chairman of the AMA Committees on Nursing and Allied Health, he grapples with this problem daily. At the Long Island campus, plans include courses leading to a master's degree for nurses and at least baccalaureates for others in allied health fields.

While the "final profile" of the Stony Brook curriculum is still to be determined, basic features already are well developed.

Stony Brook will, if the options laid down by Dr. Pellegrino are all put into practice, offer a multitrack curriculum providing briefer initial exposure to basic sciences and in-depth coverage of those sciences relevant to "special roles like medical research, clinical specialty, community medicine, family medicine, biomedical engineering, and medical social sciences. Each track will require a different concentration of basic sciences and clinical experiences. The undifferentiated physician of the past will be a rarity."

Stony Brook brings the health professions together by providing common classrooms, clinical experiences, and models of patient care simultaneously involving students from all of the schools at the center. In addition, a physicians' assistant program is

Continued on page 34

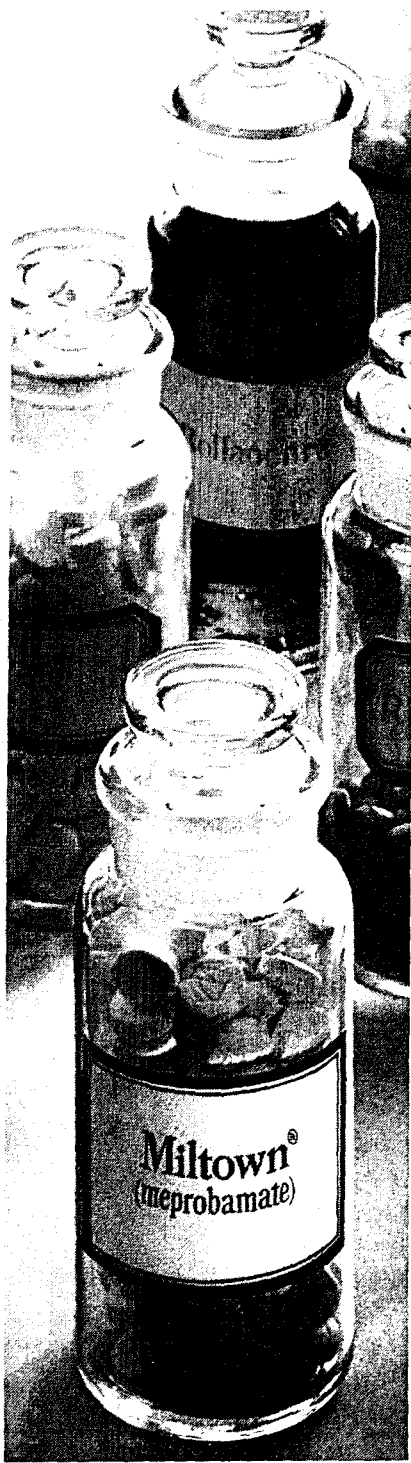
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already under way in the School of Allied Health Professions.

Dr. Pellegrino believes a new health profession will eventually emerge, encompassing all the existing health professions in one new body dedicated to the improvement of community and individual care. It will engender a "spirit of medical ecumenism."

The Pellegrino blueprint calls for earlier entry into medical studies, a briefer stay there, and flexibility in program selections. The Stony Brook student will have clinical experiences practically from the day he steps on campus, but not all his studies will be there. There will be time on the wards and in doctors' offices and provisions for "drop-out periods for work, research, or liberal studies."

Dr. Pellegrino is mapping plans for widespread affiliation, stretching out to the more than forty hospitals on Long Island. Not only will this bring better medical care to the communities, but he believes it will provide the kinds of experience needed by physicians and other health professionals.

"A major deterrent to the expansion in the number of health professionals," he contends, "is the limitation imposed by classic curriculum structures and the insistence on providing the major experiences for all students at the medical centers themselves.

"By a judicious combination of curriculum revision and the conversion of a number of community hospitals into major clinical teaching units, it can become realistic to think in terms of significantly larger entering classes in all the health professions. The

programs proposed for Stony Brook are designed to do just that."

He considers affiliation important. And while he doesn't infer that patients in nonteaching hospitals receive lower quality care, he feels they lose the advantage of that "critical air of inquiry prevalent in a university-affiliated institution."

"Affiliation is a university's pastoral responsibility," he adds. "It should be the concern of a medical center to involve every institution and professional in its area."

Dr. Pellegrino realizes he "can't be everywhere at once," nor can he be all things to all people. But he tries. He is constantly on the go—lecturing, writing, working behind the scenes rather than in the limelight, to further his medical philosophies.

Despite a heavy schedule, he refuses to let his laboratory and scholarly activities take a back seat to the more demanding administrative chores. His laboratory work concentrates on complex studies of the physical and organic chemistry of calcified tissues. He likes to work with small groups with an ultimate team goal of establishing a biochemical definition of metabolic bone disease.

Most recently, Dr. Pellegrino and his researchers have been trying to determine where carbonate fits into the crystal structure and they are taking a closer look at the calcium maturation of bone crystal in the alien embryo. "That," he says, "is a matter which has vexed chemists for a hundred years. We don't have the answer, but we think we've sup-

Continued on page 38

effectiveness of the combination vaccine

M-M-R (MEASLES, MUMPS, AND RUBELLA VIRUS VACCINE, LIVE | MSD)

M-M-R has shown no significant reduction in seroconversion rates. The seroconversion rates remained at a sufficient level to demonstrate a high degree of effectiveness.

Year Released	Vaccine	Number Vaccinated	Number Susceptible*	Seroconversion Rate
1971	M-M-R	1,951	756	{ 96% Measles { 95% Mumps { 94% Rubella

*to all three diseases

The effectiveness of M-M-R (reflected in seroconversion rates) could be reliably demonstrated in relatively small numbers of susceptible children, because of the large numbers of children tested with the component vaccines.

No untoward reactions peculiar to the combination vaccine (M-M-R) have been reported.

Moderate fever (101-102.9 F.) occurs occasionally. High fever (over 103 F.) occurs less commonly. On rare occasions, children who develop fever may exhibit febrile convulsions. Rash (usually minimal and without generalized distribution) may occur infrequently.

Since clinical experience with measles, mumps, and rubella virus vaccines given individually indicates that very rarely encephalitis and other nervous system

reactions have occurred, such reactions may also occur with M-M-R. A cause and effect relationship, however, has not been established.

Excretion of the live attenuated rubella virus from the throat has occurred in the majority of susceptible individuals administered the rubella vaccine. There is no definitive evidence to indicate that such virus is contagious to susceptible persons who are in contact with the vaccinated individuals. Consequently, transmission, while accepted as a theoretical possibility, has not been regarded as a significant risk.

Adverse Reactions: Fever, rash; mild local reactions such as erythema, induration, tenderness, regional lymphadenopathy; thrombocytopenia and purpura; allergic reactions such as urticaria; arthritis, arthralgia, and polyneuritis.

Occasionally, moderate fever (101-102.9 F.); less commonly, high fever (above 103 F.); rarely, febrile convulsions.

Encephalitis and other nervous system reactions that have occurred very rarely with the individual vaccines may also occur with the combined vaccine.

Transient arthritis, arthralgia, and polyneuritis are features of natural rubella and vary in frequency and severity with age and sex, being greatest in adult females and least in prepubertal children. Such reactions have been reported with live attenuated rubella virus vaccines. Symptoms relating to joints (pain, swelling, stiffness, etc.) and to peripheral nerves (pain, numbness, tingling, etc.) occurring within approximately two months after immunization should be considered as possibly vaccine related. Symptoms have

duration. The incidence in prepubertal children would appear to be less than 1% for reactions that would interfere with normal activity or necessitate medical attention.

How Supplied: Single-dose vials of lyophilized vaccine, containing when reconstituted not less than 1,000 TCID₅₀ (tissue culture infectious doses) of measles virus vaccine, live, attenuated, 5,000 TCID₅₀ of mumps virus vaccine, live, and 1,000 TCID₅₀ of rubella virus vaccine, live, expressed in terms of the assigned titer of the NIH Reference Measles, Mumps, and Rubella Viruses, and approximately 50 mcg neomycin, with a disposable syringe containing diluent and fitted with a 25-gauge, 5/8" needle. Also in boxes of 10 single-dose vials nested in a pop-out tray with a separate box of 10 diluent-containing syringes.

For more detailed information, consult your MSD representative or see the Direction Circular. Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point Pa. 19486

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Otic Solution, in package containing
15 cc. bottle with separate dropper-
screw cap attachment.

Ayerst AYERST LABORATORIES,
New York, N.Y. 10017

plied a lot of new information which will give direction toward developing a new theory as to just where the carbonate fits in."

Dr. Pellegrino expresses his views at many national committees and task forces dealing with the most significant issues in education and the health professions. And while many are "progressive," he prefers to confine them to this arena, to work within the existing framework of medicine.

"I eschew crusades and spectacular statements," he says. "What lasting value would they have? A few headlines, a day of glory in the public eye, and ostracism by my colleagues."

Widely published, author of nearly 200 books and medical papers, member of four editorial boards, a lover of words and an addict to using them well, Dr. Pellegrino believes writing, as we know it, may be on the way out. He's convinced that medical journals, as doctors know them today, will fall prey to the growing sophistication of the computer. Even at Stony Brook, plans are being made to train future physicians in the use of the computer for medical care, diagnosis, and continuing medical education.

This poses a philosophic question: will physicians be able to retain their individuality in an age of computerization?

Dr. Pellegrino manages to do just that by spending his time away from medicine indulging his lifelong interests in medieval and modern philosophy, in the translation of Latin poetry, by playing tennis or the piano, and by supervising his sons who keep the lawn of his Long Island home in trim suburban condition.

His most absorbing and rewarding hours are spent in his study, adding to his collection of 4,000 nonmedical books and dreaming like Cicero of a library in a garden as the penultimate setting for a civilized life.

At home there are eight Pellegrinos besides himself. He and his wife, Clemantine, have seven children, 9 to 26 years of age.

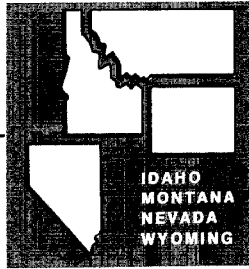
"We're almost evenly divided," he says, "between those who are biologically oriented and those concerned with political science."

Two of his sons are headed toward medical careers. Thomas enters the University of Kentucky Medical School this fall. And Michael, still in high school, appears headed toward a medical career.

Two of his children are interested in law, and the others are still too young to decide what fields they wish to follow. In keeping with his own childhood, his home, he feels, is the major "humanizing influence in my life."

Even as he dreams of new worlds to conquer, he seeks to balance his multiple interests through deeper family involvement. And he looks forward to "one more challenge while I still have the required mental and physical agility new ventures demand." This will come, perhaps, in the "quiet years, an early retirement from posts of leadership to more contemplative endeavors—adding to my library and, most important, writing a cultural history of medicine."

And in doing so, Dr. Pellegrino hopes to follow another Plato prescription: the ultimate blending of medicine and philosophy. ■



REGIONAL OFFICE
MOUNTAIN STATES REGIONAL MEDICAL PROGRAM

BOX 5796, BOISE, IDAHO 83705
 305 FEDERAL WAY, BOISE, IDAHO 83705
 TELEPHONE: (208) 342-4666

September 20, 1972

Ms. Dorothy M. Bailey, Writer
 Office of Communications and
 Public Information
 Department of Health,
 Education and Welfare
 Public Health Service
 Health Services and Mental
 Health Administration
 Rockville, Maryland 20852

Dear Dorothy:

Thanks for sending me the copy of the Nurse Practitioner vignette which you prepared. It is an excellent condensation, with only three minor changes to be made:

In paragraph 4, third line should read:

... "University Medical Center which was offering a
 (instead of its first) pilot program..."

(Stanford no longer offers this specialized training - since the pilot program for five nurses was conducted.)

The last sentence in paragraph 4 should read:

... "Since February, 1972 they have been employed as
 Family Nurse Practitioners under the sponsorship of
 an Idaho physician..."

On the Back-up Sheet, the Core Staff Contact should be listed as Mrs. Laura Larson, R.N., in our Regional office, rather than Mrs. Merrell who is no longer with MSRMP.

A sequel to the story, for your information, is that Dr. Edwards, the sponsoring physician, suffered a fatal heart attack July 2, 1972, and the Cambridge clinic manned by one of the Nurse Practitioners was closed. Just this month, the Clinic was reopened, when an Oregon physician offered to sponsor the Nurse Practitioner "until a permanent physician can be found... This is too good a program to let it die," he said.

Sincerely,

Helen Thomson
 (Mrs.) Helen Thomson
 Coordinator of Information

HT:kd

Santa Rosa, Calif.
Press-Democrat
(Cir. D 49,222 - S 51,331)

APR 14 1973

Renewed Hopes For Coast's Dental Clinic

By Staff Correspondent

SACRAMENTO — A rural dental clinic on the Mendocino Coast could keep its doors open for another year, under new legislation introduced this week by Assemblyman Barry Keene, D-Santa Rosa.

The Greenwood Project, used by hundreds of people, mostly children, in its first year, is now threatened by a loss of federal funds.

The clinic was the subject of a lengthy feature article last weekend in a Bay Area newspaper.

Keene's bill would continue the rural dental clinic pilot project, which is now funded a \$28,000 grant from the federal government's Regional Medical Program.

The clinic, in the small town of Elk, is scheduled to be abolished in June because of a lack

of funds, according to Keene.

It was established by Dr. John Frankel, a dentist and veteran of 20 years with the U.S. Public Health Service, and is the only clinic for miles around which offers dental services.

"This project is acknowledged by everyone as a most successful model," Keene said. "In just a year, it has provided dental care to hundreds of patients, mostly children.

"It enabled dental students and instructors a chance to donate their time and skills to serve people who not otherwise receive dental care," Keene added.

The assemblyman said his bill would appropriate \$28,000 to continue the clinic for another year "so that dental care will continue to be available to low-income persons on the Mendocino Coast."

Willits, Calif.

News
(Cir. No. 1,747)

APR 18 1973

Ambulance Techs Meeting

The Emergency Ambulance Medical Technician Course originated from Regional Medical Programs as a direct result of the efforts of Everett Peterson, owner of Willits Ambulance service.

The course has been built to State Department of Public Health specifications in accordance with the new health training bill AB 1730 which became effective for all ambulance and rescue personnel in March.

It will carry certification from the Ukiah Adult Education School Principal Marshall Leve.

Dr. R. Lyman is the physician coordinator and Martha Peterson R.N., co-owner of Willits Ambulance is the clinical instructor and nurse coordinator.

The instructors include 15 Mendocino County physicians, officer Stone of the Calif. Highway Patrol, Arnold Ormsby, Ormsby Ambulance, Joseph Calamusa, Administrator of Howard Hospital, Martha and Everett Peterson and Ken Donahue, Fire Chief-Ukiah.

The classes started in Jan. and will continue through June 12. Classes will be held in the evening with clinical experience totalling 18 hours. The clinical experience will be given at Howard Hospital, Ukiah General Hospital, Lakeside Hospital, and Redbud Hospital.

The students are required to spend actual time working in the hospital emergency rooms.

Since none of the participating hospitals are teaching institutions— it necessitated making many sacrifices and adjustments to accomodate the students and it is gratefully acknowledged that these hospitals so willingly met the demand in order to assure the program of success.

It was emphasized that it was no minor task to assimilate and put on a course of this nature for our area; but it has proven to be exceptionally rewarding and enthusiastically received.

There are presently 47 students enrolled and many times that figure anxious to enroll in the next class, a

continuing program through Ukiah Adult Education. The students represent a three county area and include ambulance, firemen, forestry and law enforcement and hospital personnel.

The course consists of lecture-discussion-demonstration-observation and participation. The classes were scheduled to meet at Howard Hospital but because of their size the facilities of Baechtal Grove School were graciously offered by Principal Paul Ubelhart.

This is another example of the wonderful community effort and cooperation to see that a course of this nature which will

serve to upgrade emergency care meets with success.

The following are the list of the physicians serving as instructors:

Robert Smalley, M.D.; William Foster M.D., and Joseph Stetz M.D. of Willits; George Fisher M.D.; Richard Guthrie, M.D.; Robert Werra, M.D.; Jose Villarica, M.D.; Robert Kraft, M.D.; Frank Dailey, M.D.; Eugene Lapkass, M.D.; Leland Wilson, M.D.; K.O. Ridgley, M.D.; Hugh Curtis, M.D.; and Richard Lyman, M.D., the Program Coordinator all from Ukiah. Don Thomas, M.D. — Fort Bragg.

A report of activities from
the Cancer Advisory Committee:
Special Listing Project of the
Joint Commission on Accreditation of Hospitals

BENJAMIN F. BYRD, JR., MD, FACS, *Nashville*
Chairman, Commission on Cancer
American College of Surgeons

In the spring of 1972, a contract to identify resources available in hospitals in the United States with special capabilities in diagnosis, treatment, and education programs related to heart disease, cancer, stroke, or advanced kidney disease was entered into between the Joint Commission on Accreditation of Hospitals (JCAH) and the Regional Medical Programs Service (RMPS) of HEW. At about this same time JCAH entered into a subcontract with the American College of Surgeons, through its Commission on Cancer, to prepare that portion related to cancer. The report by the commission is now nearing completion of its initial phase, and it is the feeling of the commission that Fellows of the College should be advised of the fashion in which this report was put together, and of the broad objectives that guided the commission to its preliminary conclusions.

The Commission on Cancer of ACS is named by the Board of Regents and is made up of

members of the College and of liaison members representing various national professional organizations with a special interest in the field of cancer. (*Ed. note: a current and complete roster of the Commission on Cancer can be found in the ACS Bulletin, Vol. 58, No. 5, May 1973, page 24*). Because of the composition of the commission, as well as its more than thirty years' experience in surveying cancer activities, the decision was made for the commission to do the preparatory work as described herein. A Cancer Advisory Committee for the JCAH Special Listing Project was appointed, containing representatives from the American Academy of Pediatrics, the College of American Pathologists, the American College of Radiology, the American College of Physicians, and the American College of Surgeons. Many of the individuals from these organizations belong to other societies of regional and national scope with special interest in cancer and related problems.

A Steering Committee of the JCAH Special Listing Project studied at length the ways of obtaining information that could lead to the categorization of facilities in the four fields of interest. It was agreed that a mail survey of hospitals in the United States, other than psychiatric institutions, should be conducted to assay the current availability of facilities and personnel in each institution. Responses to the questionnaire were received from hospitals representing 94 percent of all acute care hospital beds in the United States. From the responses to this survey of 7300 hospitals, an inventory has been prepared which identifies

In brief . . .

This report presents a brief history of the development of a program administered by the Joint Commission on Accreditation of Hospitals to determine which hospitals, other than psychiatric, in the United States are equipped and staffed to provide the diagnosis and treatment of four major diseases (heart, cancer, stroke, or advanced kidney), and of the role of the Commission on Cancer in carrying out its responsibilities, under subcontract with JCAH, for the cancer segment of the program.

creased involvement in the areas of cost control and quality care delivery in response to rising national interests. Discussions for achieving these goals centered around the utilization of data obtained by continuing surveys, as in the Study on Surgical Service for the United States, or by analysis of computer data generated by PSROs, HMOs, medical foundations, or the medical insurance industry. It was hoped that there would be increased dissemination of this information through mechanisms such as the BULLETIN, or perhaps by trial sessions at Clinical Congresses along the lines of the open forum held by this committee last fall.

The discussants were strongly interested in the ACS developmental work involving norms and guidelines for standards of surgical practice. It was felt that this activity at the ACS level could provide important support for surgeons involved with these activities at community or chapter levels. It was anticipated that these guidelines would improve the level of effectiveness and competence as concerned Fellows attempt to optimize both cost and quality of surgical care in their own hospitals.

The workshop discussants wished to thank ACS for sponsoring these sessions for young surgeons. Many gained additional insight into the scope of activities and problems addressed by the ACS. All felt both stimulated and encouraged to become more involved in health care delivery issues.

Workshop IV

Surgical manpower distribution, job placement, and recertification

CONSULTANT:

Francis D. Moore, MD, FACS, *Boston*

CHAIRMAN:

William P. Longmire, Jr., MD, FACS,
Los Angeles

RECORDER:

Stephen L. Wangenstein, MD, FACS,
Charlottesville, VA

Considerable discussion focused on the role of the family practitioner in performing surgical procedures. The College's position in this sensitive and important area was pointed out (*Ed. note: see Bull., ACS, Vol. 58, No. 6, June 1973, 3, 29, 30*).

How to deal on the local level with such procedures as endoscopy, placement of dialysis catheters and closure of small lacerations was a matter for extended review. It was emphasized that a clear definition of what constitutes major surgery as contrasted to minor surgery had never been delineated.

The overall consensus of the discussion was that the performance of operations such as

hernioplasty by family practice physicians is declining and that recently trained family physicians are not eager to carry out major surgical procedures. The need to define the areas where family physicians, allied health personnel and surgeons might best use their special talents and expertise in providing the best surgical care for the widest group of patients was stressed.

The problem of attracting well trained surgeons to rural areas and smaller towns was discussed. It was concluded that it would be useful to encourage availability of information concerning open surgical positions in all areas of the country to surgical residents and surgeons considering changing location. Such information would include surgeon to patient population ratios, type of other physicians in the area, and other data. Further, information that would indicate that certain areas might be undesirable as a potential job site, such as an already overcrowded surgical situation, would be included.

The increasing number of foreign medical graduates taking the board exams in surgery and assuming surgical positions in this country was discussed. It was concluded that the foreign medical graduates fulfill an essential role in this country at the present time, and that there would be a health care crisis if foreign medical graduates were not allowed into the country. However, it was felt that many of the foreign trainees are exploited and do not receive training of high calibre. It was suggested that it might be useful to eliminate surgical training programs that do not offer high quality training.

The problem of recertification was reviewed and it was believed that the College should require attendance and participation in surgical programs of continuing education by its members. As an example, it was suggested that a Fellow of the ACS should attend a certain number of ACS meetings over a specified period of time. In addition, recognition, in the form of a certificate, for attending these meetings might be considered. Physical capacity was also mentioned as a possible factor in recertification.

Continued on page 29

the wide range of personnel and facilities that have special bearing on one of the four areas of study.

At the same time this inventory was being accumulated, the Cancer Advisory Committee was asked to prepare sets of criteria that would permit categorization for the identification of those institutions having special capabilities for the care of the cancer patient. These criteria were completed by the Cancer Advisory Committee in January 1973, and then reviewed in conjunction with the inventory of facilities which became available about the same time.

The inventory has been submitted to the Department of Health, Education and Welfare and will be published this summer by the Government Printing Office. The criteria, following exposure to interested persons via publication in professional journals, will be reviewed, together with comments and criticism, if any,

by the Cancer Advisory Committee and will be submitted, upon approval of the Board of Commissioners of JCAH, to DHEW. The anticipated publication date of the criteria is July, 1974. Both the criteria, when published, and the inventory will be available to any person, lay or professional, requesting them.

At the same time this work has been going on, similar preparations have been completed and submitted in the fields of heart disease, stroke, and advanced kidney disease. Documents of the same scope and furnishing essentially similar points of reference will be published in these areas at the same time as the cancer documents.

Following are the *Introduction of the Cancer Advisory Committee Report*, and the opening paragraphs of the *Guidelines for Categorization of Hospitals for Cancer Patients*.

The most important requirement would be a special interest in the cancer patient on the part of the staffs of such institutions. The entire problem is made exceedingly difficult by the great number of different disease complexes included under the term "cancer". This necessitates consideration of the many capabilities required in evaluating the patient; in defining and carrying out treatment programs; in long term follow-up to provide rehabilitation, early treatment of possible recurrent disease, and early detection of any new foci; and, most important, in critical evaluation of the effectiveness of the treatment program in patient improvement and survival as well as cure. Only as a by-product should the individual hospital concern itself with the problem of epidemiology. This is a different field and must be approached in a different fashion from the requirements of Section 907 of PL 89-239 (as amended by PL 91-515).

The committee has held as a premise that the cancer patient should be treated as close to his or her home as the availability of trained staff and specialized facilities will permit. The criteria for various categories of facilities have been programmed to this end.

It is equally in the public interest that unnecessary reproduction of facilities should not

result from the criteria recommended by the committee. The governing thought has been to improve the care of the cancer patient, and, to this end, the following guidelines have been employed in developing the criteria:

1. Every cancer patient should be able to find basic diagnostic services within his own community;

2. Every cancer patient should be able to find excellent diagnostic and treatment capabilities within his region;

3. The eventual goal will be to make all cancer services available as close to home as can be justified;

4. Considerations of: (a) geography, (b) population density, (c) limitations in numbers of highly trained specialists, (d) economic limitations on the availability of highly specialized and very costly equipment, and (e) the need for a certain volume of cancer practice to maintain expertise of a highly trained team for certain services, all point in the direction of regionalization of services and the necessity of making available a stratified system of care;

5. Hospitals vary in their size, number, and degree of specialization of their staffs, and in the availability of specialized equipment and services;

Continued

6. Hospitals should also be differentiated as to their missions and each should try to identify that mission and range of services most appropriate to its local situation;

7. Once a hospital has decided on its appropriate mission, it should endeavor to do everything possible to fulfill its mission at as high a level of quality as possible;

8. Wherever it is not practical or economically feasible to have certain specialists on the staff of a particular hospital where diagnosis and treatment for cancer patients are provided, arrangements for immediate consultation should be well established in advance so that no undue time is lost in obtaining expert advice on any cancer problem. The patient can then either be treated in that hospital with benefit of expert consultation or referred for care to a hospital where the necessary expertise is available; and

9. Where it is not practical or economically feasible to have highly specialized and expensive equipment for the treatment of cancer patients located in a given hospital, arrangements should be made for access to such treatment. It should be possible either to share such equipment with another hospital or community resource nearby, or to refer the patient to a more distant hospital or regional cancer center where such equipment is available (justified by having a large enough number of cancer patients to maintain the expertise of the staff and to keep the cost of the treatment per patient at a reasonable level.

To be more specific, all hospitals accepting responsibility for definitive diagnosis and treat-

ment of cancer patients should provide the following:

1) Multidisciplinary approach: for all cancer patients, with consideration of and access to all modalities of therapy;

2) Education and training: must accept responsibility for maintaining a structured program of continuing education in cancer for its own professional staff and community physicians, and for the development of a practical level of cancer-oriented health education for allied health professionals and the lay community it serves;

3) Assurance of quality care: must have utilization review, medical audit, and discharge planning;

4) Rehabilitation: full services available in house or by referral;

5) Effective follow-up through a cancer registry and periodic re-evaluation; and

6) Continuity of care: an established relationship with at least one extended care facility, nursing home, ambulant or limited care facility and a home care service.

On the basis of these considerations, the Cancer Advisory Committee recommends identification of three general categories of hospitals plus a special category including centers devoted entirely to the treatment of cancer, or to the treatment of special types of cancer, or limited to the treatment of special categories of patients (such as women or children). The three general categories selected correspond essentially to those identified by the Commission on Cancer of the American College of Surgeons.

In summary, the Cancer Advisory Committee for the Special Listing Project of JCAH has reached agreement on sets of criteria based on the above guidelines which it proposes as a basis for categorization of hospitals. A detailed report defining the categories and setting forth the appropriate criteria will be published in selected professional journals in the near future. Fellows of the College interested in reviewing this report may write to the Commission on

Cancer, ACS, 55 East Erie Street, Chicago, Illinois 60611. The Cancer Advisory Committee will welcome constructive criticism of the proposals in this to-be-published report and hopes the project will stimulate the health and hospital professions to consider carefully the most appropriate development of hospital-based resources for the care of cancer patients in any given hospital.

SPECIAL ARTICLE

CONTINUING MEDICAL EDUCATION IN THE SOVIET UNION

P. B. STOREY, M.D.

Abstract Physicians in the USSR practice within a system organized for flow of health-care services to the public, and for flow of patients to appropriate back-up diagnostic and therapeutic facilities. The present medical-education policy of the USSR Ministry of Health is oriented toward increasing the qualifications of all physicians. This poses a complex problem for postgraduate medical education in the Soviet Union. To meet the challenge

the Ministry has evolved an educational system that binds all phases of medical education and is noteworthy for its commitment of personnel, financial and organizational resources to the lifelong improvement of a physician's knowledge and skills. The most important role is that of the 13 Institutes for Advanced Education of Physicians, under the leadership of the Central Institute in Moscow.

CONTINUING medical education in the Soviet Union ranks with undergraduate and graduate medical education as a critical element in general quality control of the Soviet health-care system. As such, it is organized and funded on an All-Union scale in such a way as to assure it a top-priority role in the medical educational establishment. It is closely integrated into the lifelong medical educational process, existing in dynamic balance with other levels of medical education so that its own objectives and characteristics change and grow in relation to changes in the entire health-care system and its educational underpinnings. Because of the universal organization of the Soviet health-care system, which integrates its services, research and educational components, continuing medical education for given physicians or types and groups of medical workers is closely oriented to the needs of their daily work.

Soviet "continuing medical education" is carried out under the auspices of the Institutes for the Advanced Education of Physicians.* The Central Institute for such education is in Moscow. Its "centrality" is reflected in the fact that it is concerned not only with its own pedagogic programs for physicians from the entire Soviet Union but also with the study of the methodologic problems involved in lifelong learning for physicians.

The function of the Institutes for Advanced Education is not really understandable outside the context of the entire Soviet educational system and the health-care system, both of which contain their own processes of differentiation that are related to each

other in the lifelong development† of the individual physician.

DIFFERENTIATION IN THE SOVIET EDUCATIONAL SYSTEM

The process of differentiation begins with the child in the 10-year general school, where his future is determined by the interplay of environmental and personal determinants. Many of the 10-year schools are specialized. For example, about 30 schools in Moscow now specialize in providing some of the curricular instruction in the English language, and two use the Spanish language. If a child happens to live in the area served by such a school, and if his parents are agreeable, his primary foreign-language development is initiated. If during his progress through the 10-year school, the child manifests a special affinity for a given discipline such as mathematics he may be transferred to a school with stronger resources in that subject. In any case most students will receive a prolonged exposure to mathematics, chemistry and physics, which will prepare the eligible ones to take competitive examinations for entry into the medical institute. The present ratio of applications to available places in the medical institutes is seven to one.

Granting successful outcome of the entry process, a critical point of differentiation occurs in that the prospective student now must enter on one of five possible routes: the medical faculty (*lechebniy*); the hygiene faculty; the stomatologic faculty; the pediatric faculty; or the medical-biologic faculty.

Entry into one of these routes represents a commitment that does not allow for crossover at subsequent points in time, except by re-entry. Thus, the

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*"Instituti dlya Usovershenstvovaniya Vrachey," which means literally "Institutes for the Improvement of Physicians."

†In the Russian language the word "usovershenstvovaniye" carries the implication that one's daily experience and reflection upon it should contribute materially to the evolving maturity of the individual personality. This is the lifelong process of usovershenstvovaniye of a member of society, a process subject to both individual and social control.

students who enter any but the medical faculty will not in their careers be concerned with problems of adult medicine or surgery. Similarly, the student entering the medical faculty has elected not to be involved in the care of children. The medical-biologic faculty is a new one. It was added four years ago to provide for students who wished to become involved in the science of medicine and not in the care of patients.

Until 1968 the curriculum lasted for six years, at the end of which the student was assigned to his first clinical post. Now a seventh year has been added, the beginning of which represents a critical point of differentiation into the major medical and surgical specialties. The seventh year is approximately equivalent to the American "straight internship." The student from track one, for example, now elects medicine or surgery or obstetrics and gynecology, and commits himself to that field of interest. The addition of this year to the curriculum of the medical institutes represents the decision of the Ministry of Health to move toward more specialized training of young physicians before they start their careers.

At the end of the seventh year the student receives his diploma and seeks his first clinical assignment, which will last for three years. This becomes another critical point in the process of differentiation because the strengths of the hospital or polyclinic to which he is assigned will determine his ability to pursue specialized study in a given field of medicine or surgery, and will condition his future selectability when he has completed his obligatory first three years. For example, the department of gastroenterology at his new hospital may be on the accredited list for training in gastroenterology. If it is not, he cannot move upward in the "categories" of proficiency of this particular area of medicine.*

At the completion of these first obligatory three years the next critical point of differentiation occurs. This one is conditioned by many external factors as well as by the make-up to this point of the young physician. As in any country, there are desirable and undesirable posts, with a strong proclivity on the part of physicians for the big city institutions. Such posts are available only on a competitive basis, so that one's particular experience and qualifications are important determinants of eligibility for a given post. Position availability, whether as an advanced trainee in the *ordinatura* (clinical specialty training) and *aspirantura* (academically and research oriented) graduate programs or as a staff member, thus becomes a determinant of the likelihood of and the rate of progression of a physician through Categories III, II and I of a given medical specialty, a

*The degree of educational accomplishment and expected proficiency in a given medical specialty is indicated by "categories," Category I being the highest, and Category III the lowest.

characterizing quality that in turn determines his ultimate eligibility for leadership in the profession.

It is important to have an idea of this process of differentiation to understand the organization and administration of the continuing education process. The narrative used above to illustrate it is somewhat simplified but should suffice to afford insight into the educational make-up of the Soviet physician. If further details are desired, the reports of the exchange missions in health¹ or the monographs by Field^{2,3} are helpful.

Standardization in the Soviet Educational System

Another general and very influential process in the Soviet system must be considered — that of standardization. The separate ministries concerned with education and with health care seek to make uniform on a national basis their respective processes and their respective or conjoint products. They achieve this end either directly, by establishing universally applicable educational objectives, curricula and norms of student response, or indirectly, by operating through the corresponding ministries of the various republics that make up the Union of Soviet Socialist Republics. Standardization is also sought by a detailed characterization of the functions of a given type of worker and by a close description of the responsibilities and duties of a given position.†

Knowledge of these factors allows the faculty of the Institutes for the Advanced Education of Physicians to meet a most important educational constraint — that of knowing where a student is in his educational attainment and, critically, where he should be in terms of his job requirement. Application of this knowledge guides the faculty in the development of curriculum and in the selection for a given course of students with like backgrounds and similar educational needs. The further requirement for a more detailed knowledge of the actual educational need of the individual student in relation to his own performance is attained by a process known as "precycle preparation." The prospective student receives a series of assignments, of greatly varied nature,‡ which he accomplishes in a given time, perhaps as long as six months, before his actual "presence" at the institute. These assignments are turned in to a faculty advisor, who reviews them and makes judgments on the educational status of the learner. The learner's subsequent activity during his presence at the course is shaped to some extent by this process of

†The scientific organization of work is a highly developed methodology in the Soviet Union. It is abbreviated as NOT — from the initial letters of "Nauchnaya, Organizatsiya Truda — the "Scientific Organization of Work."

‡This may range from submission by the student physician of the details of his own investigative study of a clinical problem, to his completion of a work-study project in a narrow field now of special interest to him — e.g., clinical electrocardiography as required for emergency purposes.

evaluation of his need, related to his observed performance and the requirements of his position.

Any number of variations on this theme are possible, ranging from rather broad-scale coverage of a subject such as electrocardiography for a hospital ordinator ("ward physician"), or of the principles of social hygiene for a regional medical administrator, to acquisition of a particular surgical skill by a highly competent surgeon.

The important point to be noted in seeking to understand the Soviet continuing educational system — its objectives, its organization and its programs to meet those objectives — is that norms do exist for both the individual student at a given stage of differentiation and development, and for the position that he occupies or seeks to occupy.

Organization of the Continuing Medical Education System

In the Soviet organizational system for health care there is the whole issue of upward mobility of physician employees. This critical concept, in general, is missing from our own organizational notions concerning continuing medical education.

In terms of objectives the stated overall purpose of the Soviet system is "the improvement of the professional skill and qualifications of the physician" — a goal that can be accepted as that of the American understanding of continuing medical education.

This improvement of the professional skills of the physician is the concern of the USSR Ministry of Health. Soviet doctors can improve their skills at city, at regional and at inter-regional (oblast) hospitals, at advanced training faculties attached to medical institutes, and at the special institutes for the advanced education of physicians. There are 13 of the special institutes, located in Leningrad, Kazan, Kiev, Kharkov, Minsk, Tbilisi and other cities, the largest one being the Central Institute in Moscow, which is related to all others.

The Central Institute in Moscow has 61 departments and 77 professors. In addition, it has 115 associate professors on its staff. The chairs of the institute are grouped into five faculties: general medicine; surgery; pediatrics; medical biology; and sanitation and hygiene. The Institute is headed by a rector and four pro-rectors, who are responsible for training, research and administration. Its administrative facilities and some of its educational facilities are located at the large hospitals and the clinical research institutes of the city, with more than 9000 beds available to the Central Institute for its educational programs.

Illustration of some of these features may be obtained from reference to the Central Institute's Annual Listing of Courses for 1970,⁴ which is a 47-page description of the courses, their characteristics, their duration and physician-student eligibility to participate in them. The educational activity itself is

based for the most part on the departments and active clinical and research units of the many hospitals and institutes of Moscow, under the administrative direction of the Central Institute.

A very important point to note about this is that the top-level personnel at these locations away from the Central Institute are not staff members of the peripheral institutions who "volunteer" to "run courses" for the Institute for Advanced Training of Physicians, but the opposite: they are full-time faculty members of the Central Institute who are located out where they can do their clinical and research work, an aspect that is essential for their continued competence as members of the faculty of the Institute. Furthermore, all appointments to the Institute's faculty are term appointments (seven-year), with a complex administrative and professional arrangement for reappointment or new appointments to these prestigious positions. Such an organizational arrangement guarantees the priority of duties of the incumbents.

Educational Programs of the Central Institute in Moscow

Because of its "central" role the Institute in Moscow accepts physicians from all over the country and maintains a deliberate trend toward development of its programs for the more highly skilled physicians, leaving less highly developed resources to be used at the more local facilities of the other 12 institutes. Thus, the Central Institute attracts heads of local public-health and medical-care bodies (of republics, territories, regions, and large cities); teachers from the higher medical establishments (the medical institutes and the postgraduate medical educational institutes); top specialists (surgeons, internists, pediatricians, obstetricians, psychiatrists, etc.); head physicians of large hospitals or departments of hospitals; and head physicians of sanitary epidemiologic stations and their laboratories.

In 1965 the number of physicians who studied at the facilities of the Central Institute exceeded 10,000. An increase in number of physician students in recent years has been attributed to improvement in educational methodology, and most importantly to the introduction of the "pre-course extramural and course intramural" approach.

Before he arrives at the Institute the physician prepares for the intramural period at his own residence without giving up his regular work. By reading the recommended literature and doing written assignments, including reviews of pertinent literature and reporting on his own clinical or laboratory investigations, he may go through a period of preparation of three to four months. All this work is guided by members of the departmental faculty of the Institute, who recommend to him the appropriate literature and send him specially prepared and printed lectures, methodical material, and training aids.

The Institute believes that this period of prelimi-

nary study lets him develop at his own pace a much more thorough knowledge of the subject being considered and also gives the faculty the opportunity to evaluate him and to design his subsequent institutional period of study more appropriately. This is a convenience for the physician, his family and his place of work, and at the same time it allows the Institute to increase its number of students. The intramural or institutional component of the cycle will last for one to two months at a minimum.

Some of these features are shown in Table 1, which lists the particular educational offerings of one of the 61 departments of the Central Institute for 1970. One may notice several special points from this table and from the remainder of the catalogue that illustrate some of the characteristics of the Soviet system for continuing medical education:

To begin with, there are no short one-day, two-day or one-week "courses." Of the 406 courses listed for 1970 by the Central Institute, very few are of only one month's duration. Thus, a colossal commitment of educational resources by the Central Institute (and the other Institutes throughout the USSR) is matched by a substantial physician investment of time and effort into each course.

Secondly, preparatory home study and clinical experience are hallmarks of most of the listed courses, with emphasis on melding of practical and didactic work.

Thirdly, the actual duration of the intramural part of the course in Moscow varies considerably. During this time the participating physician maintains his regular salary, and receives an additional stipend to cover his expenses away from home. A

recent physical addition to the resources of the Central Institute is a high-rise "Dom Vrachey," or house for doctors, which functions as hotel, restaurant and library for the participating physicians. Seminar rooms and electronic equipment are available for use at the building.

Fourthly, the course in electrocardiography requires a five-month period of home-study preparation, with a subsequent period of two months to be spent at the Botkin Hospital. To facilitate the preliminary process, a practical manual in clinical electrocardiography⁵ was developed, and 3000 copies published for the Central Institute. This serves as the reference source that the physician can use as he moves through his home study assignments.

Fifthly, the type of student is identified for each course. Thus, the course in cardiovascular and renal disease indicated in the third item in Table 1 is designed for chiefs of service at back-up level hospitals.

Sixthly, of the five courses listed at the First Department of Medicine at the Botkin Hospital, two are filled with physician students selected by the Ministry of Health itself. All courses are listed in the nationally circulated twice-weekly newspaper for medical personnel, the *Meditinskaya Gazeta*.

Seventhly, two of the courses (the second and third items in Table 1) are given away from Moscow, in the smaller cities of Petropavlosk and Kaluga.

Eighthly, the emphasis on cardiovascular subjects in this listing represents the function of the department as headed by Professor A. Z. Chernov. The listing of the courses of the Second Department of Medicine is oriented to chest disease and clinical pharmacology, which are the special competence of this department under Professor B. E. Votchal.

Table 1. Courses in Continuing Education Offered by Department of Internal Medicine I of the S. P. Botkin Hospital, Moscow, in 1970.

ITEM NO.	COURSE
1	Functional methods of investigation of cardiovascular system: for general internists of hospital-polyclinic institutions of city of Moscow & Moscow region Thematic study from Jan 1 to June 30 (course conducted by means of telecasting, on intermittent basis) Physician assignment by Central Health Office of Moscow
2	Current problems in cardiovascular pathology: for general internists of Kamchatsky oblast Thematic study from Sept 10 to Oct 10 Circuit course in city of Petropavlosk-on-the-Kamchatka
3	Diseases of cardiovascular system & kidneys: for general internists of Kaluzhky oblast Thematic study from Oct 1 to 28 Circuit course to city of Kaluga
4	Diseases of cardiovascular system & kidneys: for heads of medical divisions of republic, krai, oblast, & city hospitals Thematic study from Oct 26 to Dec 26 Physician assignment by USSR Ministry of Health
5	Clinical electrocardiography: for directors of (electrocardiographic) diagnostic stations, kray, oblast, & city hospitals & polyclinics Thematic study, precourse preparation from Aug 1 to Dec 31 Studies at Institute will be in 1971 Physician assignment by USSR Ministry of Health

The actual content for two courses is shown in two addenda, which can be obtained on request.* The first of these, entitled "A Teaching Plan and Program for the Course of Specialization of Pediatricians in Pediatric Hematology" (Table 2), was developed by the Institute of Pediatrics of the Academy of Medical Sciences of the USSR and reviewed by the director of the Department of Hospital Pediatrics of the Leningrad Pediatric Medical Institute on October 28, 1968; 250 copies of the teaching plan were issued.

DISCUSSION

The Soviet system of continuing medical education differs in a number of major respects from the American concept of continuing medical education.

There is no doubt that there is an enormous or-

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Table 2. Course Outline for Pediatric Hematology.*

ITEM NO.	SUBJECT MATTER	NO. OF TEACHING HR		
		LECTURE	PRACTICAL	TOTAL
1	Blood system in children (morphology & physiology)	8	52	60
2	Current methods of investigation in pediatric hematology	4	12	16
3	Clinical picture & differential diagnosis of diseases of blood system	82	408	490
4	Immunohematology & blood transfusion in pediatrics	10	2	12
5	Organization of care for hematologic patients	2	—	2
6	Clinical cytology & cytochemistry	—	18	18
7	Marxist-Leninist philosophy & medicine (in special program)	24	—	24
	Totals	130	492	622

*Duration of course, 4 mo (622 teaching hr).

ganizational and financial investment in it. It is a principal form of medical education, comparable in investment of resources to the undergraduate system and to the graduate educational system that produces the medical specialists (i.e. the "ordinatura" program, which produces the clinical specialists, and the "aspirantura" program, which produces the research scientists and professors).

Perhaps the problem can be looked at through two questions, the first of which is whether this is the Soviet method for producing medical specialists. The answer to this question has to be both yes and no. There are the graduate programs, mentioned above, that correspond to our residency and fellowship training programs and ultimately lead to academic and staff rank in the Soviet system. These are the principal lines of development of the medical specialist and would account for the negative answer. But in terms of ordinary practicing physicians, who are not part of this academic and clinical elite, the affirmative answer is appropriate. It is obviously intended in the course on pediatric hematology, for example, that the trainees are going to be involved thereafter in pediatric hematology — but probably not exclusively so. So that what one sees here is again an expression of the organization of the Soviet health-care system that is not directly translatable to our own frame of reference. The working pediatrician with a particular interest, for some reason, in pediatric hematology, or from a polyclinic or hospital that has a need for improved pediatric hematology service, can take out four months full time to develop some special knowledge and skills to add to his capability as a pediatrician and to the management resources of his institution. Depending upon his professional background and the nature of the institutional resources subsequently to be developed, the ultimate effect of the four months' educational program is, in fact, the appearance of a

specialized service in a given institution providing care for a particular population of children.

There is probably a historical determinant operating here, in that the principal function of the Institutes for Advanced Education may previously have been to teach the essentials of a given specialty to cadres of physicians as the medical-care system evolved following the Revolution and World War II. Now, with maturing of the general and graduate medical educational systems, the role of the Institutes has been reoriented to continuing education of physicians who are already specialists in their own fields.

The second question concerns the relation between the Institutes and the graduate system for production of medical specialists as such. The connection is an intimate one — but again explicable only in the context of the Soviet system. The Institutes no longer produce the specialists as such — i.e., as a primary function. However, it will be recalled that the Central Institute in Moscow organizationally and financially supports an enormous faculty resource at the leading medical-care institutions of the city. These faculty members of the Institute for Advanced Education are full-time heads of service at their daily working institutions where the full-time training of specialists takes place. These trainees thus represent one aspect of the function of the Central Institute, as distinguished from the relatively short-term educational courses provided for physicians already in practice, which are listed in the Central Institutes' annual schedule.⁴

There is thus an organizational integration of continuing education with graduate education that is unique in its orientation. Continuing education is the primary reason for the existence of the Institute and determines its organizational arrangement. This is in exactly the opposite direction from the American system, in which the graduate training is primary and continuing education is usually an accessory burden.

Butrov and Alekseev, indeed, consider postgraduate medical education to represent all medical education that takes place beyond the undergraduate programs of the medical institutes. They divide this conceptually into two consecutive stages: "specialist training" and "further training," the former to provide the necessary theoretical knowledge and practical skills in the specialty field concerned, and the latter to improve qualifications continuously for all physicians with clinical experience of not less than five years.⁶ The latter stage represents the major investment by the physician in his lifetime of self-improvement and by the society that supports him in this effort.

The final question is how this system for advanced training of physicians might have relevance to the American educational system.

It probably does not have very much practical relevance at present for three reasons: the loose sys-

tematization of American health care as compared with the organized, highly structured Soviet system of health-care delivery in which appropriate advancement and reward can be given to and limited to those with better training and performance; the decentralized, university-based, independent nature of our general medical educational establishment; and the predominantly local and episodic orientation of continuing medical education in our country, with no central or long-term direction available to it.

There are, however, some potential frames of reference to which the Soviet experience might be relevant. One is the concept of a National Academy for Continuing Medical Education.^{7,8} The organizational and programmatic structure of the Central Institute could serve as a useful model for the development of such a system, if the attempt were ever made to develop continuing medical education in the United States on a nationally organized basis.

Also to be considered is the developing interest of the Department of Medicine and Surgery of the United States Veterans Administration in establishing a nationwide system for the continuing education of its own medical personnel. Such an organized system for advanced medical education might find relevant models in the Russian system, both in organizational terms and in pedagogic approach. Like the Institutes, the Veterans Administration Department of Medicine and Surgery now commands or has access to large portions of the American health-care and health-education establishment. Its own organization of resources and manpower could allow for mobilization and movement of personnel for educational purposes. Educational objectives related to role needs could be determined with relative ease for Veterans Administration physicians at their different levels of activity. If such a system were developed in the Veterans Administration it might serve as an extraordinary continuing educational resource for all practicing physicians. The handling of the educational needs of private physicians in relation to the requirements of their practices would be more difficult, but probably susceptible to whatever analytical system would be developed for Veterans Administration physicians.

The third, the Regional Medical Program, is not yet sufficiently developed to allow speculation about its future organizational form, except to realize that it is a nationwide program that does place heavy emphasis on continuing medical education to attain its goals of making the best in medical care available to all the American people. To date, however, it has not been particularly successful in relating continuing education to the problems of health

care or in establishing the organization necessary to approach that synthesis of interests.

Finally, there is the question of how these three programs might get started, or how all three might function in relation to each other, in the absence of an effective co-ordinating equivalent of a ministry of health. This is the true imponderable that plagues the service and the educational components of the American health-care system. How does any system operate without leadership and co-ordination — a lack that is acknowledged throughout the system? It seems at least reasonable to suggest that the idea of a national plan for continuing medical education, as proposed by the original "Joint Committee" and developed by the Department of Postgraduate Programs at the American Medical Association,⁹ wedded to the basic concepts of the Regional Medical Program, as enunciated in the original report of the DeBakey Commission on Cancer, Heart Disease and Stroke,¹⁰ would have yielded a comparable nationwide effort if the two contemporary movements had been pulled together by a recognizable and recognized co-ordinating agency. In other words, there is a primary problem in organization of our health-care system that would have to be solved before a rational nationwide program of continuing medical education could be developed.

Given a set of decisions that would lead to a national effort in continuing medical education, it would become most important to study closely the Soviet system for what information and guidance the experience with it might provide.

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Allied health: dimensions, dilemmas, and decisions

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The allied health professions are in a state of ferment; change is the order of the day. Here is a current update of recent developments and problems.

In 1968, when I spoke to the American Physical Therapy Association, the title of my talk was "Change Is the Name of the Game: The Allied Health Professions." So much has happened to the allied health professions in the interim that only the introduction is still pertinent. I quote:

Many great thinkers have responded to a need to explain the concept of attitudes required for "change."

NAPOLÉON: One must change one's tactics every ten years if one wishes to maintain one's superiority.

C.B. SHAW: Progress is impossible without change; and those who cannot change are useless.

WASHINGTON IRVING: There is a certain relief in change, even though it be from bad to worse; as I have found in traveling in a stage coach, that it is often a comfort to shift one's position and be bruised in a new place.

ABRAHAM LINCOLN: The dogmas of the quiet past are inadequate to the stormy present; as our case is new, we must think and act anew.

Dimensions

What has happened to the allied health professions and occupations during the past decade? Cognizant of the expressed need and demand for qualified manpower to deliver comprehensive health care for this country, educational institutions at all levels began to respond through the creation of new educational structures. New divisions, schools, and colleges for the allied health professions have become one of the most far-reaching innovations in health education in several decades.

Educational programs in the United States have been identified for over 130 allied health fields. Today, over nine hundred colleges and universities are involved in the education of allied health personnel at the baccalaureate degree or higher. At the same time, hundreds of community junior colleges have already developed allied health programs. At least seventy colleges and universities have formed or are forming administrative structures for allied health programming. In addition, practically every hospital is "into" the training of allied health workers in one way or another. From all of these sources, there is the potential for development of health manpower at all levels scarcely dreamed of several years ago.

Every health profession is analyzing the need for

additional supportive personnel. Thus we see the emergence of an entirely new group of health personnel. Health news is crowded with stories about the development of physicians' assistants, associates, and specialist assistants. Professions that have labored long and hard to require graduate training for practice are now determining that assistants can enter their fields with less formalized education. Unfortunately, much of this is being accomplished in education with all too brief attention to the careful analysis of just how this new cadre of workers will fit into the health manpower structure. Present clinical programs will become the proving grounds on which the utilization of these new health personnel will be confirmed or denied.

Enrollment in curricula for the health professions is at an all-time high. Concerned students, interested in identifying and entering careers in which they can be of service to society, are discovering that jobs in the health field may come closest to meeting their personal need for service.

Thus we find more educational institutions geared to offer more health programs for more students than ever before. The combination of these factors seems to point to an unparalleled opportunity to move ahead in health manpower education that will achieve the goals for both quantity and quality in health services for everyone.

Dilemmas and decisions

What, then, is the "hang-up?" Why doesn't an evaluation indicate that we are achieving program objectives and that our health service system is functioning to its maximum capacity? Let us analyze the issues, for herein lie the reasons we still have a long way to go.

UTILIZATION OF ALLIED HEALTH PERSONNEL. Many of us support the theory that health care in this country will never be a workable system until *all* of the health professions are recognized for what each can contribute. Priority attention must be given to educational and clinical programs at all levels for the allied health professions and occupants, but until the capa-

bilities and responsibilities of each one is *understood, appreciated, and utilized* by the medical and dental community, we will never have a true system of health care. It must not be assumed that this level of utilization will just happen; it must be taught as an integral part of medical and dental school curricula. The importance of this concept of utilization is spelled out in President Nixon's Health Message to Congress in 1971 with the following terse words: "We will also encourage medical schools to train future doctors in the proper use of other health personnel."

In 1969, in my presidential address to the Association of Schools of Allied Health Professions, I said:

Barriers between and among the health professions must be broken down if we are to succeed with a viable, effective health program. Is it not now about time to consider the relationship of each health profession to each other—with the starting point of discussion not based on the relationship of the professions but rather the relationship of each to the systems of health care and the function of each in relationship to the patient? As we break down the boundaries of indifference, suspicion of intent, and concentrate on the similarities which exist in educational programs and in patient care function, we will discover new ways to learn and work together.

INADEQUATE LEGISLATIVE AUTHORITY AND FUNDING. Another dilemma is that the health legislation of the past has given little attention to the allied health fields. The only important federal legislation was passed only six years ago with the Allied Health Professions Training Act of 1966. Though grossly and inadequately funded as yet, it has at least called attention to an entire segment of the health community that has been limping along with inadequate resources. Because of the number of new programs at all educational levels developed in response to manpower needs, the net effect has been a lower level of funding of individual programs. Hundreds of new programs have been established by universities and colleges to respond to the mandate of the expressed health needs, but federal funding has been woefully inadequate to assist them. The staff of the Division of Allied Health Manpower of the Bureau of Health Professions Education and Manpower Training, Department of Health, Education, and Welfare has

waged an intense battle to get priority for funding, but educational programs counting on firm support have been sorely disappointed and discouraged.

This year we will carefully scrutinize the effectiveness of the new special improvement and special project grant approach to allied health funding. Additional funding has been authorized, and educational programs must move with alacrity to place the projects of their institution in competition for these resources.

LACK OF QUALIFIED FACULTY AND INSTRUCTIONAL PERSONNEL. One of the most serious impediments to the development of any profession or occupation is the unavailability of a well qualified cadre of instructional personnel. All of the allied health professions have been undergoing major technologic advances; look at dietetics to verify this statement. Methods of teaching innovations must be geared to the newer potentials for self-instruction, programmed instruction, and the latest teaching devices. Teacher preparation for all educational levels has been placed high on the priority lists of what we need to accomplish our goals.

NEW SETTINGS FOR HEALTH CARE DELIVERY SYSTEMS. One of the most significant challenges facing the allied health professions today is to discover and implement new geographic settings for clinical programs. I feel that dietetics, in the various ways in which the internship programs have been established, can serve as a model. We must break the mold followed by too many of the health professions, i.e., the traditional idea that the location for all clinical training of students must be the hospital. Although recognizing the special contribution of hospital settings for many programs, we must create new clinical facilities for allied health in *all* of the new settings for health care delivery systems that are receiving priority attention. These include:

Demonstration projects in nursing homes, extended care facilities, and rehabilitation centers. The growing geriatric population has prompted the building of hundreds of new extended care facilities, but only now do we recognize the crucial manpower shortages for qualified personnel to staff them. From the President of the United States on down, there has been

sharp criticism leveled at these expanding programs. Lack of adequately trained manpower to provide quality health care, rather than custodial supervision, has been a major hindrance to advances in the care of our older population and of the severely disabled. Many of the educational programs for the allied health professions have an obligation to expand their clinical programs to react and respond to these new facilities. Assistants, aides, and volunteers must be trained and supervised to participate in a comprehensive manpower surge to assure quality health programs in these new health facilities.

Neighborhood health care clinics and inner-city health projects. Current experience already dictates that aspirations for delivery of quality and quantity of health care in these new kinds of out-reach facilities will seldom be achieved without delegating responsible roles to allied health personnel for planning, developing, and implementing health programs which will respond to the needs and objectives of the community. Allied health educators must make every effort to coordinate their clinical programs with cooperative programs sponsored by Model Cities, Regional Medical Programs, and Comprehensive Health Planning in local communities.

Rural health care. Statistics prove that the rural areas of the country are in as severe need of health manpower as many urban sectors. Only recently has the plight of the rural community been given priority attention. Another challenge that will tax allied health education will be to orient clinical education for many of the allied health professions to the needs of primary care physicians in their efforts to bring quality care to rural communities, including migrant workers' camps.

Health maintenance. I will not add to the controversy over the efficacy of health maintenance and the establishment of Health Maintenance Organizations (HMOs) as one of the new approaches to health care insurance and making comprehensive health care readily available. However, with emphasis on *prevention* of illness and the *maintenance* of good health, more attention will be given to identifying early health problems and to the sharing of health information concerning dietary and nutritional prob-

lems, drug information, alcoholism, birth control, environmental control, abortion, and similar problems.

This will be shared and delivered where people learn in schools, work in factories, and live in homes. This shift in emphasis from a "sickness system" of acute and intensive care to a prevention-environmental and extended care-rehabilitation emphasis will require important changes in priorities in educational programs. The allied health professions, along with medicine, dentistry, and nursing, must conscientiously reassess ways in which curricula can assure implementation of the priority of prevention.

Recruitment of disadvantaged groups into the allied health professions. Is it not now time that we recognize the important role we must play in recruiting minority groups to participate in allied health manpower? Many members of the minority and other ethnic groups have made important contributions to our professions, but we must make a concerted effort to reinforce this position. Much of the delivery of health services in the new settings will be delivered by representatives of nursing and the allied health professions. Opening up this number of new positions in the health field brings with it the obligation to recruit many new professional personnel from those groups disadvantaged in various ways from full participation in these advancements. I have the privilege of being one of two white persons serving on the new national committee, Equal Representation in Allied Health, and some of my finest professional experiences have been in working with groups in the

Watts community in their efforts to establish a comprehensive new allied health educational program. Not only must we as a nation be in a better position to provide a higher quality of health care in these areas, but we must attract and hold minority representation in the delivery of this care.

Career mobility and equivalency testing. The importance of these two concepts and the decisions needed to make horizontal and vertical mobility a reality and not just a dream cannot be underestimated. The national attention being placed on equivalency testing is now beginning to reap dividends as each profession assesses the ways in which academic credit can be derived and awarded for other than pure classroom work.

Conclusion

As professional educators, clinicians, and administrators, are we ready to make decisions that will respond to the changes in educational programming and clinical practice that each health field must make? With financial resources tighter than ever, we must pull in our belts and set for ourselves a different set of priorities—those that reveal a deep commitment to change.

"Yesterday is but today's memory and tomorrow is today's dream," so the Prophet says. May some of the dreams expressed here prove to be, for the profession of dietetics, the response to necessary changes that will bring you to an even greater role in health planning and health service in the future.

New protein-rich dairy product

A protein-rich dairy product that could double the milk supply for children of India has been developed by the Central Food Technological Research Institute of Mysore, India, with support from the National Institute of Arthritis and Metabolic Diseases, Bethesda, Maryland. The new product, called "Miltone," is a blend of pure peanut protein, hydrolyzed starch sirup, and bovine or buffalo milk. Previously, the residue after oil was extracted from peanuts was used as fertilizer and feed. Now the peanut protein is extracted by a new process (developed during research) and mixed with milk. After pasteurization and bottling, it is distributed to markets and urban state welfare centers for children of low-income families.

As part of a long-term, nutrition research program, the goal of the Mysore project is to develop protein-rich foods and food supplements from inexpensive, indigenous protein sources that will improve the nutritional health of persons in developing countries—*From HSMHA Health Reports, 86: 979, 1971.*



CORONARY CARE NURSE TRAINING PROGRAM

AN EVALUATION

Ruth Scheuer

A coronary care training project was established by the Western Pennsylvania Regional Medical Program at the University of Pittsburgh to extend the knowledge, skills, and confidence of nurses caring for cardiac patients. To assess the effectiveness of the four-week course a 120-item multiple-choice examination was developed, which measured the nurse's knowledge as well as her confidence in that knowledge. Nurses were required to give the correct answer to each item as well as to designate whether that answer was certain, a partial guess, or a guess. Posttest results showed that nurses who completed this specialized course performed better and with greater confidence than on the pretest. Whereas only 27.4 per cent of the answers were both correct and given with a high degree of certainty before the course, this figure rose to 66.3 per cent following the course. A six-month follow-up examination of participants showed that knowledge retention of coronary care principles remained high and that 77 per cent of the nurses tested were working in intensive coronary care areas. The ultimate goal of the project was to improve the care of patients in intensive coronary care areas. An ongoing method to assess morbidity and mortality in regional coronary care units was established as a result of this project.

EDUCATORS responsible for specialized coronary care courses need to demonstrate that nurses have the requisite knowledge, skills, and confidence to perform effectively within the coronary care unit (CCU) setting (Department of Health, Education, and Welfare, 1968 and 1970; Western Interstate Commission on Higher Education and Mountain States Regional Medical Pro-

gram, 1970). In February 1970, the Western Pennsylvania Regional Program (WP/RMP) initiated a Coronary Care Training Project at the University of Pittsburgh to meet community needs for trained nurses to staff regional intensive CCU's (WP/RMP, 1970). The four-week course included 117 hours of didactic instruction, laboratory and clinical experience, independent study, and evaluation.

The following criteria were designated as essential to the success of the program: 1) participation in the four-week course would result in extending the knowledge, skills, and confidence of nurses caring for patients with acute myocardial infarctions; 2) graduates of the program would be able to utilize the knowledge and skills acquired; and 3) patient care would be improved (Scheuer, 1970).

The purpose of this paper is to describe the methods utilized and results obtained in the evaluation of these objectives.

Method

Upon entering the program, the student submitted a questionnaire providing information on her age, previous coronary care work experience, educational background, and expected area of employment at completion of the program. This information, in conjunction with pretest results, enabled the faculty to ascertain which students might need extra help during the course.

Since the nurse in the CCU is required to take decisive action in critical circumstances, it was deemed important that she not only increase her knowledge of acute coronary care during the four-week program, but also that she exhibit confidence in this knowledge.

A multiple choice 120-item examination was given before (pretest) and after (posttest) the course. This test included a Confidence of Knowledge Scale¹ which measured changes in the student's knowledge as well as the degree of confidence in that knowledge. For each test item the student indicated the correct answer as well as her confidence in this choice based on the following criteria: 1) CERTAIN—all three incorrect items could be identified; the correct item has been isolated. 2) PARTIAL GUESS—one or more items could be identified as incorrect, but the correct item could not be identified. 3) GUESS—no item could be identified as incorrect.

The 120-item test was divided into eight categories: concepts of coronary care, physiology, myocardial infarction, normal electrophysiology, abnormal electrophysiology, pharmacology, complications, and psychological aspects of coronary care. An analysis of the knowledge and confidence scores in relation to these specific content areas, made for each course, enabled the faculty to examine specific course content and determine areas of weakness and strength within the program. The faculty could then set standards of performance based on knowledge-confidence testing.

A simulated coronary care area was built to serve as a learning laboratory for students in the program. This unit contained teaching aids as well as equipment available in most CCU's. At the completion of the program an Arrhythmia Anne,² capable of simulating specific cardiac emergencies, was utilized to test the student's arrhythmia recognition and her ability to institute appropriate treatment including: defibrillation, cardiopulmonary resuscitation, and definitive drug therapy. To complete the course all students were required to pass this examination.

A field coordinator attempted to visit each participant within six months following her training course in order to: 1) ascertain whether the student was employed, either directly or indirectly, in the care of patients with acute cardiac disease; 2) obtain a retrospective evaluation of the course by the student in light of her experience in the intervening six months; and 3) administer an additional post-course examination which served as an indicator of knowledge retention. This examination also was used to pinpoint specific areas of learning which needed to be reinforced.

Because the ultimate goal of the coronary care project is the reduction of morbidity and mortality in patients with acute myocardial infarction, the project criterion most difficult to evaluate, but perhaps most important, has been the effect of the training program on patient care. The process by which this goal is achieved is multidisciplinary and multifocal.

As policies and standing orders set by a hospital

determine, in part, whether the nurse can apply her knowledge and skills of acute coronary care, each nurse was requested to submit a copy of the CCU policies and standing orders of the hospital in which she was employed. Examination of these policies showed that, in some units, nurses were not permitted to institute life-saving treatment such as defibrillation and administration of specific cardiac drugs. Consequently, the staff of the Regional Medical Program, in consultation with its Heart Committee and the faculty of the Coronary Care Project, developed and distributed comprehensive Coronary Care Unit Standing Order Guidelines³ to all hospitals in the region. A follow-up survey was planned to ascertain if, and how, these guidelines were adopted.

Although patient care statistics were collected in most hospitals with a designated coronary care area, these data were neither systematically compiled nor standardized. Therefore, a Coronary Care Morbidity and Mortality Statistical Form³ was developed by the WP/RMP and introduced to hospitals whose nurses participated in the program. Statistics are compiled monthly by the nurse in the unit and sent to the Regional Medical Program office. Every six months reports are returned to each hospital summarizing statistics from its own unit with an analysis of cumulative data from all participating hospitals.

Results

Comparative analysis of pre- and posttest scores of 200 students relating knowledge to degree of confidence is shown in Figure 1. Whereas only 27.4 per cent of all responses were both correct and given with a high degree of certainty on the pretest, 66.3 per cent of the responses on the posttest were answered correctly and with a high degree of confidence.

Pre-post knowledge-confidence scores by content area are shown in Table 1. These data illustrate that the percentage of answers in each category which are both certain and correct is markedly higher on the posttest than on the pretest. However, there is no difference between pre- and posttest answers which were incorrect but given with a high degree of confidence.

The Kruskal-Wallis One-Way Analysis of Variance by Ranks (H Test) (Siegel, 1956, pp. 184-193) was utilized to determine whether factors such as age, prior work or educational experiences in coronary care, and expected area of employment post-course were correlated with student pre- and posttest performance (Table 2). The H Test indicated that pre- and posttest performance of students 35 years and under differed significantly (at the .01 level) from those 36 years and older (Table 2A). General educational background was not a significant factor in pre- or posttest performance (Table 2B). Tables 2C and D illustrate that

¹ The scale is adapted from the "Certainty Scale" developed by the Office of Research in Medical Education, University of Washington, for the Washington-Alaska Medical Program.

² Arrhythmia Resusci Anne is manufactured by the Laerdal Medical Corp., Tuckahoe, New York.

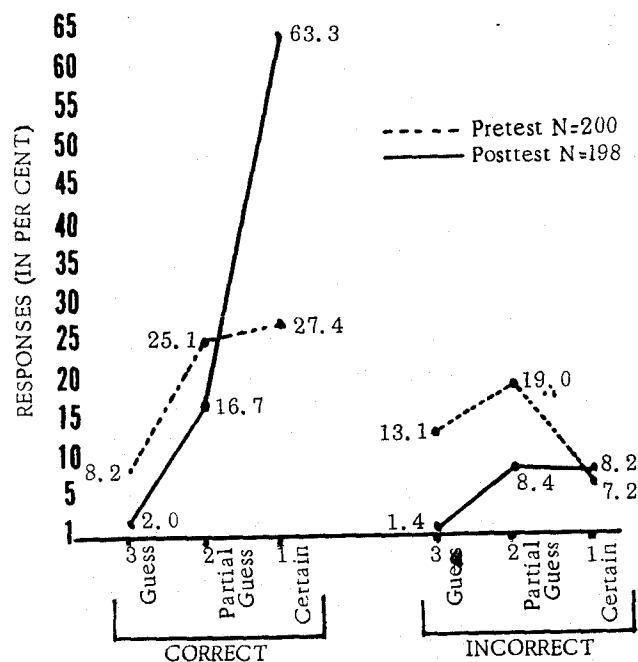
³ These are available upon request from the Western Pennsylvania Regional Medical Program, 3530 Forbes Avenue, Pittsburgh, Pennsylvania 15213.

only pretest performance was affected by prior education (formal or in-service) in coronary care. When students were grouped into categories delineating prior arrhythmia instruction (Table 2E), experience monitoring patients (Table 2F), area in which employed (CCU or areas other than CCU) prior to entering the course (Table 2G), and expected area of employment post course (Table 2H), significant differences in pre- and posttest performance among the groups were noted.

Since initiation of the Coronary Care Training Project, the field coordinator has made approximately 184 visits to individual students within six months following their completion of the course; 142 students (77 per cent) were found to be working in an intensive coronary care environment. This figure correlates with the number of students who expected to return to an intensive coronary care environment after completing the course. Six per cent of the students were no longer working, and 17 per cent were working in areas other than intensive coronary care.

Data on follow-up testing of 120 students were collected. Eighty-five students were given identical precourse, postcourse, and follow-up examinations. Sixty-five per cent of their total responses were correct on the pretest, 88 per cent on the postcourse test, and 85 per cent on the follow-up examination, indicating that knowledge retention of coronary care practices at the six-month follow-up remained high. In September 1970, the follow-up test was

Figure 1. Correct and Incorrect Responses to 120-Item Pre- and Postcourse Tests Relating Knowledge to Degree of Confidence*



* Pretest raw mean 72.9 (61 per cent correct)
 Posttest raw mean 98.1 (82 per cent correct)

Table 1. Knowledge-Confidence Scores by Content Area Expressed in Percent*

CONTENT AREA	POINTS	PRE- POSTTEST CORRECT ANSWERS IN RELATION TO CONFIDENCE						PRE- POSTTEST INCORRECT ANSWERS IN RELATION TO CONFIDENCE					
		(1) CERTAIN		(2) PARTIAL GUESS		(3) GUESS		(1) CERTAIN		(2) PARTIAL GUESS		(3) GUESS	
		PRE %	POST %	PRE %	POST %	PRE %	POST %	PRE %	POST %	PRE %	POST %	PRE %	POST %
Concepts	1	70.5	98.0	16.0	1.0	1.5	1.0	3.0	—	5.0	—	4.0	—
Physiology	33	27.0	62.0	27.0	19.0	9.0	2.0	7.0	8.0	18.0	8.0	12.0	1.0
Myocardial infarction	21	28.0	59.0	28.0	17.5	5.0	1.5	9.0	9.0	21.0	11.5	9.0	1.5
Normal electrophysiology	21	35.0	76.0	21.0	10.0	9.0	1.0	6.0	6.0	15.0	6.0	14.0	1.0
Abnormal electrophysiology	22	21.0	61.0	22.0	17.0	11.0	2.0	8.0	10.0	20.0	18.0	18.0	2.0
Pharmacology	14	23.0	55.0	23.0	18.0	10.0	2.0	7.0	10.0	23.0	13.0	14.0	2.0
Complications	6	23.0	64.0	30.0	21.0	7.5	1.0	4.0	6.0	21.5	7.0	14.0	1.0
Psychological aspects	2	40.0	65.0	26.0	11.0	2.0	1.0	14.0	13.0	16.0	10.0	2.0	—
Total points	120	27.4	63.3	25.1	16.7	8.2	2.0	7.2	8.2	19.0	8.4	13.1	1.4

* Pretest N = 200 students
 Pretest mean = 72.9
 Percent correct = 61
 Posttest N = 198 students
 Posttest mean = 98.1
 Percent correct = 82

Table 2. Pre- and Posttest Performance Related to Student Background* (N = 198)

A. AGE							
AGE GROUP	NUMBER (%)	PRETEST PERFORMANCE**			POSTTEST PERFORMANCE**		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
Up to 35	161 (81)	74.7	62.2%	75	99.9	83.2%	100.5
36 and over	37 (19)	65.0	54.0%	62.5	90.1	75.1%	89.1

B. GENERAL EDUCATIONAL BACKGROUND							
EDUCATION GROUP	NUMBER (%)	PRETEST PERFORMANCE ¹			POSTTEST PERFORMANCE ¹		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
Diploma only	176 (88.9)	72.6	60.5%	72.5	97.8	81.5%	99
Collegiate	22 (11.1)	75.9	83.0%	78	99.9	83.0%	100

C. PREVIOUS COURSE CORONARY CARE NURSING							
FORMAL COURSE GROUP	NUMBER (%)	PRETEST PERFORMANCE**			POSTTEST PERFORMANCE ¹		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
None	172 (87)	71.7	59.7%	73	97.7	81.4%	99
Up to 1 week	10 (5)	76.2	63.5%	75	96.9	80.7%	97
2 weeks and over	16 (8)	83.7	69.7%	84	101.9	84.9%	103

D. PRIOR IN-SERVICE EDUCATION CORONARY CARE NURSING							
IN-SERVICE CC GROUP	NUMBER (%)	PRETEST PERFORMANCE**			POSTTEST PERFORMANCE ¹		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
0 to 5 hours	130 (66)	70	58.3%	69.5	97.2	81.0%	99
6 to 20 hours	58 (29)	79	65.8%	78	99.9	83.2%	101
Over 21 hours	10 (5)	76.5	63.7%	79	99.8	82.3%	99

E. PREVIOUS ARRHYTHMIA INSTRUCTION							
INSTRUCTION GROUP	NUMBER (%)	PRETEST PERFORMANCE**			POSTTEST PERFORMANCE**		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
None	50 (25)	63.3	52.7%	61	93.5	77.9%	94
Up to 10 hours	84 (42.4)	73.7	61.4%	65.5	98.5	82.0%	101
11 hours and over	64 (32)	79.3	66.1%	78.5	100.9	84.0%	102

F. PREVIOUS EXPERIENCE MONITORING PATIENTS							
EXPERIENCE GROUP	NUMBER (%)	PRETEST PERFORMANCE**			POSTTEST PERFORMANCE*		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
None	45 (23)	63.1	52.6%	60.5	94.5	78.7%	95.5
Up to 1 year CCU-ICU	86 (43)	73.6	61.3%	74	98.7	82.2%	100
Over 1 year CCU-ICU	67 (34)	78.7	65.6%	77.5	99.5	82.9%	100

G. AREA WORKING IN PRIOR TO COURSE							
AREA GROUP	NUMBER (%)	PRETEST PERFORMANCE**			POSTTEST PERFORMANCE**		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
CCU-ICU	127 (64)	77.1	64.2%	77	99.8	83.2%	101
Other	71 (36)	65.4	54.5%	64	94.9	79.1%	96

H. EXPECTED AREA OF EMPLOYMENT POSTCOURSE							
AREA GROUP	NUMBER (%)	PRETEST PERFORMANCE**			POSTTEST PERFORMANCE*		
		MEAN	% CORRECT	MEDIAN	MEAN	% CORRECT	MEDIAN
CCU-ICU	159 (80)	75	62.5%	75	99.1	82.6%	100
Other	39 (20)	64.3	53.6%	61.5	93.7	78.1%	96

* Based on Kruskal-Wallis One-Way Analysis of Variance (H-Test) (from Stegel, 1956, pp. 184-193)

¹ Not significant

* .05 level of significance

** .01 level of significance

Table 3. Six-Month Follow-up Test Scores Related to Area of Employment

AREA OF EMPLOYMENT	NUMBER TESTED	MEAN FOLLOW-UP SCORES CORRECT %
Nurses working in ICU-CCU	30	85.5
Nurses working in areas other than ICU	5	68.4
Total	35	83

shortened because of time restrictions. Test results of 35 students given the shorter follow-up examination are shown in Table 3. As might be expected, nurses working in intensive coronary care areas scored higher than nurses not working in these areas.

Discussion

Comparison of pre- and postcourse examinations measuring knowledge and confidence showed that participation in the coronary care course increased the knowledge as well as the confidence of the participants. The Confidence Scale is a valuable instrument for measuring changes in the student's ability to predict the correctness of her response. The scale has been used in student counseling when discrepancies between the student's predicted knowledge and actual knowledge are displayed. Students who demonstrated more knowledge than confidence or the reverse could be assisted by the faculty to explore ways in which to correct knowledge or confidence deficits.

Follow-up student interviews indicated that the majority of the students returned to care for patients with acute coronary disease, and, therefore, utilized knowledge and skills learned during the four-week program. Test scores at six-month follow-up suggested that although knowledge retention of coronary care principles remained high, those nurses who did not return to an intensive coronary care area required frequent follow-up instruction to maintain the level of performance achieved at the end of the course.

Analysis of student baseline data related to pre- and posttest scores helped the faculty determine which students might need extra help during the program. Nurses over 35 as well as those participants without prior experience in acute coronary care might require additional assistance during the four-week program in order to perform at the level of those who are younger or have had some experience in coronary care. The data suggested that specific courses designed for students based on their prior experience in acute coronary care might prove more efficient than a single course in which all students, regardless of their background, are included.

Although the effects of this course on patient care

The author acknowledges the assistance of Enid Goldberg, Ph. D., R. N.; Constance Settlemeyer, R. N.; David E. Reed, M. D., and Douglas Vaughan

RUTH SCHEUER (Mount Sinai Hospital School of Nursing, New York, New York; B.S., University of Pittsburgh, Pittsburgh, Pennsylvania) is research associate and assistant to the director of evaluation, Western Pennsylvania Regional Medical Program, Pittsburgh.

have not been fully determined, a system for evaluating morbidity and mortality of patients cared for in the CCU has been introduced in the Western Pennsylvania region. Whereas no hospital was reporting its monthly CCU statistics prior to 1970, 47 of the 67 hospitals with intensive coronary care areas in Western Pennsylvania were participating in the study at the end of 1971 (Reed and Scheuer, 1972). This type of record keeping and feedback hastens the recognition and correction of specific problems and leads to improved health care delivery to patients with acute myocardial infarction. The nurse's responsibility in this evaluation helps to reinforce her role as a key member of the staff of her unit.

In conclusion, evaluation of the WP/RMP Coronary Care Training Program is an ongoing multi-purpose, multidisciplinary effort. Not only does it encompass knowledge of how many nurses are being trained to care for patients with acute myocardial infarction, but it also provides valuable information regarding the learning process and how this process is translated into improved patient care for the region.

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COMMUNICATIONS

August 1972

COVERING THE TOTAL COMMUNICATIONS INDUSTRY

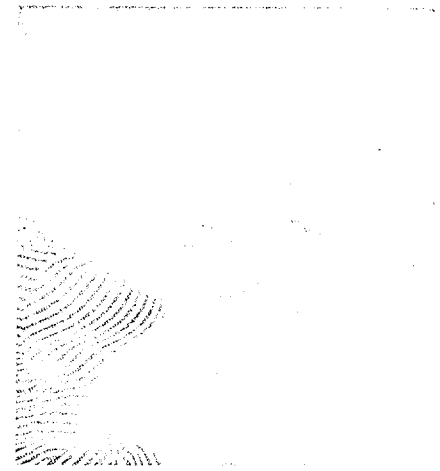
Unique Communications System Solves Arizona "Medical Isolation"

to combat "medical isolation" by providing physicians, nurses and other health workers in remote areas to the same medical resources they need to save lives and improve health care delivery. Because of the Arizona Regional Medical Library Network's Medical Library Network, this unique system speeds vital selected medical literature to other users in every part of Arizona through a system of medical libraries linked by telephone and TWX. Already the system has evidence of lives saved in its records. Further testimony of its usefulness is the fact that in 1971 alone 71,600 photocopies of literature were circulated to more than 800 physicians and 200 other health professionals in 46 Arizona communities.

A doctor in Tuba City on the remote Navajo Indian Reservation has an acute nutrition problem. Obviously, if he were located in a large metropolitan area, he might discuss his diagnosis with a colleague specializing in the problem, or consult his local medical library for the latest information as a backup. In Tuba City

he is alone, and until 1970 he would have been considered relatively "medically isolated." But no longer. Now he simply telephones Northern Arizona University, his nearest Medical Library Network relay station, with his request for, say, six recent journal articles on the problem. The Network representative identifies the Maricopa County Medical Society Library in Phoenix as the nearest place where the journals can be found and telephones a request. Let's assume, though, that only three of the articles are there, the others are at the Arizona Medical Center Library in Tucson. The Medical Society mails its articles to Tuba City and telephones or TWX's the Tucson source which sends the doctor the remaining three articles. Total cost to him is 10¢ a page, and, despite the fact that two players in the Network were involved, the chances are he got his material within 24 hours of his phone call to Northern Arizona University.

"This is the kind of rapid action that has made the Network an intensely practical aid to the practice of



Request for literature from a relay station is checked at a resource library by an Arizona Medical Library Network technician.

medicine in Arizona," says Arizona Regional Medical Program Coordinator, Dr. D. W. Melick. "Arizona is a sparsely populated state with communities separated by vast, often barren distances. Time and distance often conspire to inhibit communication and rapid communication is mandatory in delivering adequate health care. The Network has helped to alleviate this problem considerably."

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**SOUTH CAROLINA REGIONAL
MEDICAL PROGRAM**

VINCE MOSELEY, M.D., Coordinator

**THE SOUTH CAROLINA REGIONAL MEDICAL PROGRAM PLAN
FOR MANPOWER EXTENSION, AND FOR THE REGIONALIZATION
OF SERVICES AND RESOURCES TO IMPROVE HEALTH CARE**

The Regional Medical Program in South Carolina is being greatly expanded in efforts involving health manpower development, primary health care development patterns and regionalization of health facilities, manpower and other resources. This article outlines how SCRMP proposes to handle its broader function.

After consideration of the health needs and manpower deficiencies at professional, technical and occupational levels in South Carolina, the Regional Advisory Group at its Annual Meeting on December 9, 1970 adopted the following statement:

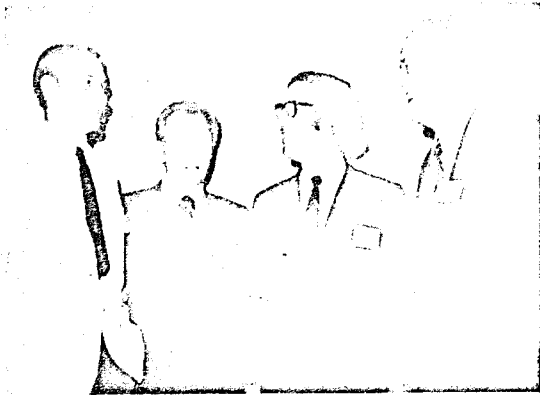
"The South Carolina Regional Medical Program is to continue programs for physicians, dentists, nurses, technical, allied health professional and occupational groups, directed towards improving patient care by continuing education and demonstration programs for the improvement of health manpower, the demonstration and encouragement of new techniques for diagnosis and treatment, programs for the improvement of facilities, particularly community hospitals, and research and training in methods to improve the delivery of health services and care. In addition to devoting attention to disease areas of primary concern — heart disease, cancer, and stroke, kidney disease and other related diseases — these programs are to utilize the specifically identified resources and linkages in ways that will deal effectively with such problems as cost control, increased accessibility, improved communications, and improved standards. Through the Medical District Committees of the Regional Medical Program, and their committee relationships in liaison with agencies concerned with planning or administration of health care programs, data are to be developed which will lead to assistance in proper planning and priority setting in respect to specific population and geographic needs. In order to assist in cost control, emphasis is to be specifically directed toward programs which will pro-

vide for early case finding, early diagnosis, ambulatory care, and preventive medicine in its broadest sense. Efforts to improve nutrition and emergency medical services are additionally recognized as objectives."

A New Mission Statement for Regional Medical Programs was adopted by the National Advisory Council in June 1971. According to this, RMP is a "functioning and action-oriented consortium of providers responsive to health needs and problems. It is a framework within which all providers can come together to meet health needs that cannot be met by individual practitioners, health professionals, hospitals and other institutions acting alone. It also is designed to take into account local resources, patterns of practice and referrals, and needs. As such, it is a potentially important force for bringing about and assisting with changes in the provision of personal health services and care."

Meeting in Myrtle Beach April 29-30, 1972, the SCRMP's Regional Advisory Group authorized the organization to broaden its goals in the following in order to: support planning and organization of community based health education programs; promote and plan for physician assistant training projects; support an expanded role of the nurse; coordinate recruitment and placement for new professional categories; evaluate impact and performance of new types of personnel; encourage manpower surveys and recruitment programs; develop health professional career opportunities for minority groups; develop and implement in-service education programs to establish career ladders and to upgrade the performance of existing health personnel.

Also, that a mechanism be established for con-



SCRMP officials confer with Dr. Harold Margulies, Director of Regional Medical Programs Service, Washington, D. C., during recent Advisory Group meeting in Myrtle Beach that resulted in an expanded health care development role for SCRMP. Shown are (left to right): Dr. Charles P. Summerall, III, associate coordinator; Dr. Vince Moseley, coordinator; Dr. Margulies and Dr. James W. Colbert, Jr., chairman of SCRMP's Advisory Group.

tinuing cooperative regional studies and modification of the obstacles that discourage physicians from entering and remaining active in primary community practice of medicine. obstacles and opportunities that influence primary care roles for nurses and other paramedical personnel and obstacles to ambulatory care imposed by third party payment; encourage use of a recently developed Problem Oriented Medical Record; design systems of public information regarding available health services and personal preventive health measures, support emergency medical services through education programs and demonstration projects; reduce infant mortality in minority populations, especially through development of prenatal care services and nurse midwifery programs.

Additionally, that shared bioengineering services programs be developed to provide improved safety, reliability and efficiency in hospitals, clinics and practitioners' offices; conduct studies on the development of facilities or programs for economical domiciliary care for the incapacitated, particularly the elderly; determine specialized services that are appropriate, needed and available and through linking of facilities achieve the maximum amount of cooperation among hospitals and institutions.

And that SCRMP be prepared to work in cooperation with appropriate professional societies who express an interest in exploring alternative care delivery systems and that SCRMP assist appropriate professional associations in developing programs assuring quality health care.

Broadening of SCRMP's efforts in health care delivery represents an expansion of the initial concept of RMP as a vehicle to speed the flow of scientific knowledge to health providers in connection with heart disease, cancer, stroke, and related diseases.

The staff of the South Carolina Regional

Medical Program has been directed to assist all project and program directors of current operational SCRMP programs in extending their service, and to assist applicants for new projects to focus their activities along the broader lines of enhancing the availability and quality of health care.

The principal objectives of the SCRMP staff, in accordance with National Advisory Council Mission statements and the Regional Advisory Group, are to:

1. Promote demonstrations among providers at the local level of both new techniques and innovative delivery patterns for improving the accessibility, efficiency and effectiveness of health care.
2. Stimulate and support those activities that will both help existing health manpower to provide more and better care, and will result in the more effective utilization and distribution of new kinds (or combinations) of health manpower. Further, to do this in a way that will ensure that professional and technical activities of all kinds (e.g. informational, training) lead to professional growth and development. and are appropriately placed within the context of medical practice and the community, by assisting with the development of Community Based Education Programs, and with programs for the implementation of the National Emergency Health Personnel Act.
3. Encourage providers to accept and enable them to initiate regionalization of health facilities, manpower, and other resources so that more appropriate and better care will be accessible and available at the local and regional levels. In fields where there are marked scarcities of resources, such as kidney disease, particular stress will be placed on regionalization so that the costs of such care may be moderated.
4. Identify, develop, and facilitate the implementation of new and specific mechanisms that provide quality control and improved standards of care. Such quality guidelines and performance review mechanisms will be required, especially in relation to new and more effective comprehensive systems of health services, and by recent legislation and draft guidelines will be necessary if RMP is to play its role in health manpower training, emergency medical services, areawide health education, and the monitoring of quality of care in HMO's and experimental health delivery systems.

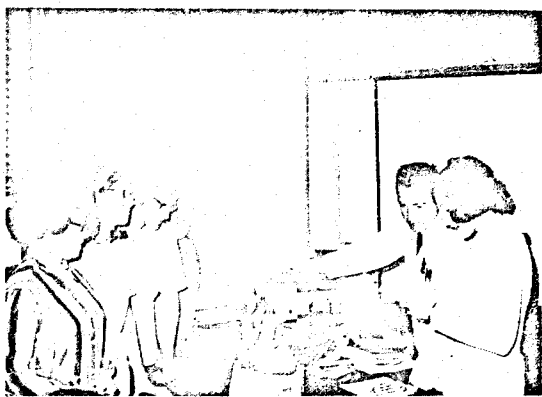
In considering the health manpower and other service deficits in South Carolina, it is very apparent that in addition to numerical deficiencies, distribution problems are of considerable magnitude.

Despite the fact that the Medical University of South Carolina is rapidly expanding

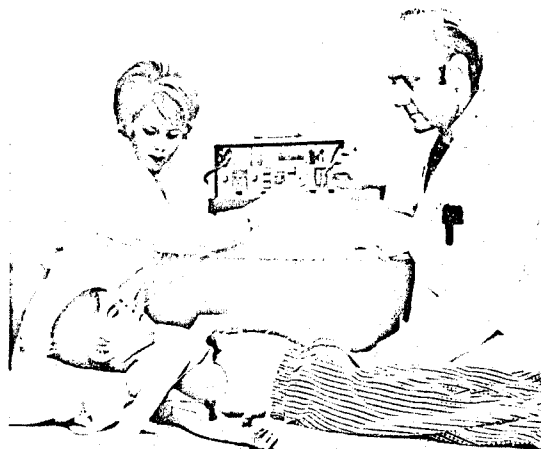
its classes in the several Colleges, not only through on-campus programs but by consortia extending its undergraduate academic training into several community hospitals throughout the State, it is evident that this will be accompanied by a considerable time lag, and that other ways to deal with the professional manpower shortages and other immediate problems must be developed. Among these are an extension of existing manpower resources at all levels by:

1. Utilization of assistants and new types of personnel;
2. Better coordination of transportation and communications for consultation, instruction and referral;
3. Application and more widespread utilization of new technology;
4. Improved resources sharing throughout the Region through program planning.

It was pointed out by the RAG in December, 1970, however, that in order to procure better planning and a more systematic utilization and application of a variety of data, including socio-economic data, to assure priority of effort, evaluation of efforts, and perspectives as to alternatives, would require the expansion and development of appropriate and qualified staff. As a result of this, the Regional Advisory Group approved the use of Developmental Component Funds for an advanced planning study. Out of this study has developed the following concept for the co-



Nurses receive updated coronary care training through courses supported by the S. C. Regional Medical Program. Shown are (left to right): Sandra Harrington, R.N., Kingstree; Linda Beaty, R.N., Myrtle Beach; Lillian White, R.N., James Island; Mary Weaver, R.N., Walterboro; Dr. Peter C. Gazes and Jan Herod, of the Medical University of S. C. Division of Cardiology.



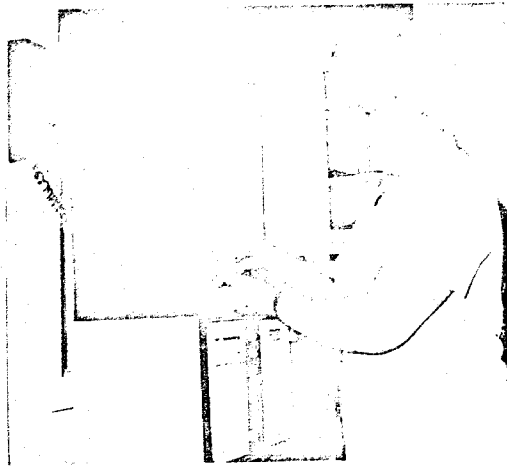
The SCRMP supported statewide Children's Heart Screening Program is carried out by Dr. Arno Hohn (right), Medical University of S. C. Hospital, assisted by Miss Julia Breeden.

ordination and implementation of these several and related activities in the Region, including combining funds from other agencies or foundations, both public and private, with those of RMP for study or operational grant purposes.

CONCEPT:

It is evident that for an effective regional or statewide program to be developed, and in consideration of other new program activities now being developed or supported by Federal appropriations, that an overall coordinating body for the entire State should be developed to which the Regional Medical Program can effectively relate at the Regional level. In addition to its established sub-region or community relationships with regional councils, CHP-(b) agencies, Appalachia, Model Cities, Coastal Plains, and other health planning bodies or councils, the SCRMP now has effective sub-regional operations. At the State level, however, and particularly in view of the compactness of the entire State in geography, transportation and communications, a regional systems and program planning resource is urgently needed.

This is needed for full community of effort in order to provide for true regionalization of resources and regional planning. Currently, there is no overall coordination or single resource for service to assist community or sub-regional area planning activities or to assist or develop regionalization linkages for im-



Introducing new technology is an important part of the expanded SCRMP mission. An example is linking community hospitals by telephone to major medical centers for coronary care consultations. Above, Mary Harrelson, R.N., sends heart patient's electrocardiogram (EKG) from Dorchester County Hospital, Summerville, to the Medical University of S. C. Hospital's CCU by telephone.

provement of health care by systems approaches, or to regionalize communication and consultative activities for health services.

The staff of the South Carolina Regional Medical Program is currently providing to some degree such coordination of effort, as was demonstrated in the package presentation of the several grant applications submitted as a program for the improvement of health manpower through Physician Assistants Training Programs and consolidated as a combined grant application to the National Center for Health Services Research and Development and to the Health Manpower Bureau of the NIH and more recently for a similar coordination in respect to developing a community based health education center linkage for several related projects involving several community hospitals.

It is also evident that such statewide coordination of effort is immediately needed in view of the statements and recommendations made in the Public Laws for the administration of the Emergency Employment Assistance Act of 1971 (PL 92-54), the Comprehensive Health Manpower Training Act of 1971 (PL 92-54), and the Nurse Training Act of 1971 (PL 92-577), the National Center for Health Services Research and Development application guidelines and those developed

by the Regional Medical Programs Service and the NIH for Areawide or Community Health Education Centers.

To approve, establish local guidelines, monitor and evaluate such activities a Regional Planning Committee of the RAG is to be organized in order to involve in its deliberations a number of health-related agencies, professional association representatives, governmental representatives, educational institution representatives, members of the public, representatives of CHP bodies, and the members of the Medical Districts Committee, of whom the majority are now representative RAG members.

This resource will also provide guidance for Program staff to be recruited by SCRMP in order to be capable of providing the consultative staff support needed by community health study groups.

The expanded activities of SCRMP program staff, will be directed towards coordination of manpower training, coordination of continuing education, program planning and development, systems analysis, provision of appropriate consultation in a variety of socioeconomic areas needed in health planning, and for the development of demonstration or experimental programs and the evaluation of these, and especially to serve as an agency for assistance in program planning with individual community efforts to provide for an overall regional strategy.

One may ask if the present SCRMP staff is not in some sense providing for these sorts of activities now. The answer is Yes, but only in a limited degree.

The projects of the South Carolina Regional Medical Program, though initially in 1968 and until 1970 almost entirely categorically oriented, have broadened. This occurred rapidly for most as soon as project directors knew that their efforts could be expanded beyond the strictly categorical and narrower areas of care. The Program Staff has also sought to guide applicants for new projects especially to design and expand the services of currently existing personnel through new technology, have promoted the re-training of personnel, and have consulted with others interested in new arrangements for the

delivery of services. Ambulant care and services to isolated or deprived areas have been encouraged, and financially aided to improve communications. Educational supports for professional and technical groups have been extensively and assiduously organized and supported, particularly attempting via our Education Service ETV-Telephone System and other communications systems to support the MUSC to provide education to improve services and care at the community level, and provide this in ways requiring as little loss of time as possible for those receiving this instruction to be away from their everyday professional practice.

We are now attempting to assist others to utilize funds other than RMP funds that are now becoming available through the Emergency Employment Assistance Act of 1971 (PL 94-54), and the Health Manpower Training Act of 1971, both the Comprehensive Act (92-578) and the Nurses Training Act (92-577), to further these sorts of activities, and especially to focus these in selected hospitals where expanded regional services and supporting services for adjacent smaller hospitals can be established through the Community-Based Health Education Center type concept and expanded hospital service linkages.

As we look at what is needed, let us consider what the Community-Based Health Education facility for expanded manpower can do with funds which are being made available by the Congressional Acts previously mentioned.

We are learning from our Medical District Committees what the community wishes and health needs are. There is, however, no truly coordinating body statewide now to assist and able to serve in expanding or coordinating efforts except as our Regional Advisory Group and its committees do now; these can and should assist more widely. Likewise, sources for systems planning, evaluation, program planning, analysis of various data, essential for any plan with long-range prospects, do not exist in a coordinated way through which priority setting, evaluations, and the development of alternatives and the promotion of educational and informational

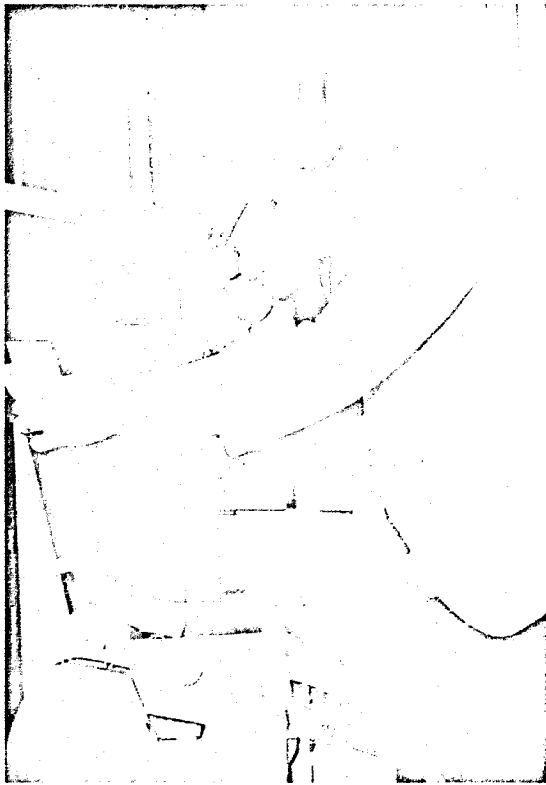
materials can be skillfully focused to promote changes or new ways for communities in an overall sense, or to prevent duplication through the promotion of sharing of resources and facilities.

Past attempts to provide certain of these consultation services by or through our Regional Office Program Staff, have been limited by force of various circumstances, such as funding and the time available beyond that required by on-going operations and development.

Other agencies, with certain of these capabilities, are likewise limited to institutional needs, and thus at many community levels, decisions are too often taken without the benefit of exact data or the sort of guidance needed for sound planning and for alternative approaches, and often with duplicative efforts.

We believe, therefore, that South Carolina can profit from a strong committee of the RAG made up of individual members who have of themselves each appropriate stature, reasonable authority, sufficient autonomy, and political impact, and who can establish by prestige and leadership recognition plans for better coordination and use of funds and grants to work at the State level with community interests in developing programs and systematic approaches to deal with local problems, but yet present these from being too isolated; but rather to be able to encourage linkages and resource sharing with some authoritative backup. This will not only better utilize SCRMP funds available for improving community health care, but will assist program development with funds from other sources.

Such a committee will need supporting staff capable of providing studies and research to improve community health, and, in addition, by an appropriate staff section act to guide educational activities needed in curriculum and program planning for community-based health education activities to promote expansion of non-professional manpower, more uniformity of curriculum and training, and transferability of training experiences, by recognition of or certification of academic equivalency for technical and oc-



A Poison-Drug Information Center at the Medical University is supported by SCRMP. Above, Sidney Smith, a pharmacist in the MUSC Hospital's Department of Pharmaceutical Services, checks information received from a computer in responding to a telephone query concerning poison or drug information.

occupational level personnel within the Region, and thus simultaneously expand training to increase the availability of services and health care, along with improved employment and advancement opportunities.

It is only by such coordination of effort that dead-ending in the health service professional or occupational fields can be prevented, that career opportunities can be opened, and that able people can be maintained in employment as a result of improved career opportunity in the health service fields.

It will be only through such efforts that the turnover rate of some skilled and semi-skilled employees in health facilities can be abated, and that job barriers can be penetrated so that occupational and educational ladders can be achieved. Only in this way can the staff workers of smaller hospitals be assured opportunities for staff advancements and receive the sorts of continuing education needed to become and remain effective aides or assist-

ants to expand the efforts of the now limited number of health professionals, which latter groups, despite all efforts by professional schools will continue in short supply for many years.

We have advised the Governor's Office and the Commission on Higher Education of our current plans to develop this concept of regionalization of effort by expanding the membership of the Medical Districts Committee. Through this same mechanism, better coordination of all State agencies relating to the health field we believe can be achieved, as well as better utilization of all our educational resources in the various colleges in our State, community and private institutions, including those of the Medical University, and our technical as well as general educational facilities.

This newly expanded committee will exert its efforts to improve health manpower needs by activities which:

"A. Encourage the establishment or maintenance of programs to alleviate shortages of health personnel in areas designated, through training or retraining such personnel in facilities located in such areas, or to otherwise improve the distribution of health personnel by area or by specialty group;

"B. To provide training programs leading to more efficient utilization of health personnel;

"C. To initiate new types and patterns or improve existing patterns of training, retraining, continuing education, and advanced training of health personnel, including teachers, administrators, specialists, and para-professionals (particularly physicians assistants, dental therapists, and pediatric nurse practitioners);

"D. To encourage new or more effective approaches to the organization and delivery of health services through training individuals in the use of the team approach to delivery of health services and otherwise;

"E. To assist State, local, or other regional arrangements among schools and related organizations and institutions; and

"F. To promote regionalization of services through improved communications involving the SCRMP MUSC II-Hospital Network, in cooperation with the State ETV and telephone system and other MUSC communication resources."

We hope members of an expanded Medical District Committee to improve Community Health Services will achieve coordination of effort in trial of new systems, and in extending manpower, activities which RMP is vitally interested in and charged with, but which it can only achieve now piecemeal because it

exists as only one of the several separate health-related organizations.

It is by this route that we believe organized Medicine and medical educational institutions can likewise best exert their strengths and knowledge in guidance and evaluation.

In order to better carry out its mission in South Carolina staff functions and committees of the Regional Advisory Group will be reorganized and be functionally oriented rather than categorically oriented. Committee membership will also reflect this to greater degree than previously. The SCRMP will be able to respond more quickly to new opportunities for the physicians of South Carolina, and other members of the health professions, to assist in seeking and securing the support needed that will:

A. Promote among providers at the local level new techniques and innovative delivery patterns to improve accessibility, efficiency and effectiveness of health care.

B. Support activities that would help to improve utilization of existing manpower and new kinds of manpower, especially in underserved areas.

C. Encourage regionalization of health facilities.

D. Assist in developing specific mechanisms for quality control and approved standards of care.

E. Likewise, the promotion and development of systems for (1) monitoring the quality of health care; (2) improvement in emergency medical services.

F. By such supports to health services delivery systems, better utilization and improved distribution of health manpower for services and patient care should result.

G. Lastly, but of primary importance, is the function of yearly evaluation and re-evaluation of the SCRMP program and its component projects. Are the programs really,

by demonstration and training techniques, actually assisting existing manpower expansion, and is health care more accessible, effective, and efficiently delivered? If not, should the objectives of the program be changed or projects discontinued? There are decisions vital to the SCRMP and other Regional Medical Programs. Simply expanding programs and expending funds will not be helpful to health care, nor merely expanding manpower.

It will require leadership, effort, and cooperation by the physicians and community leaders to accomplish the improvements needed and sought.

SCRMP can and should provide the framework for the actions needed.

The proposed membership of the newly expanded committee will consist of the following representatives, most of whom are now members of the RAG:

The State Board of Health

The S. C. Medical Association Council and Foundation

Health Insurance Providers

The S. C. Department of Vocational Rehabilitation

The S. C. Department of Education

The S. C. Department of Public Welfare

Technical education schools

The Commission on Higher Education

Office of Comprehensive Health Planning,

State Board of Health

Members from the public

The S. C. Hospital Association

The Governor's Planning & Grants Office for Community Affairs

The S. C. Department of Mental Health

The S. C. Mental Retardation Commission

The S. C. Nurses' Association

Representatives of allied health science schools

The Medical University of South Carolina

SPECIAL ARTICLE

RADIATION THERAPY IN NEW HAMPSHIRE, MASSACHUSETTS AND RHODE ISLAND

Output and Cost

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Abstract There are large variations in input, output and cost of radiation therapy among different categories of hospitals. Hospitals with similar patient loads exhibit similar investment, staffing patterns and disease mix. The use of facilities, equipment and staff in low-patient-load hospitals is less intensive and includes a high proportion of benign conditions. The high-patient-load centers make more intensive use of their resources and treat a

far higher proportion of patients with cancer, and the therapy provided is more expensive. The greater cost is due mainly to the larger and more diversified staff administering radiation therapy.

Five major centers could provide the necessary radiation therapy in the area studied. The cost would probably be higher, but the results could well be superior.

RISING medical-care costs throughout the world have induced a search for greater efficiency of resource allocation and more effective delivery of health and medical care. Much of the rise is due to the increase in utilization of medical services and to the changing nature of the practice of medicine, which involves the greater use of expensive and complex technology and procedures. The product, as Feldstein has emphasized, has changed.¹ Most economic research is concentrated on the large areas — on hospital and insurance costs, and on primary physician changes — and not with the smaller components that make up each of the areas. This study concentrates on one such component, radiation therapy.

OBJECTIVE

The purpose of this investigation is to determine the various types of diseases currently being treated by irradiation, total patients treated, the number of treatments given to each patient, the total number of treatments given in each radiation-therapy unit and the hospital costs of therapy.

STUDY DESIGN

A sample of all hospitals in New Hampshire, Massachusetts and Rhode Island from the universe providing radiation therapy was selected randomly after stratification by teaching function (university affiliated, other teaching and nonteaching) and by number of treatments given during 1968 (less than 1500 treatments, or low patient load, 1500 treatments or more, or high patient load). One fourth of the hospitals in each cell were studied, with a minimum of one hospital studied per cell.

The patient population included everyone treated

by any type of irradiation during 1969. Since data collection began in June, 1970, the financial information was gathered for the previous hospital fiscal year of October 1, 1968, through September 30, 1969. The patient treatment data were gathered for the year ending December 31, 1969.

The data recorded for each patient included the category of disease, number of treatments, inpatient or outpatient, first or recurrent course of treatment and type of treatment (supervoltage, orthovoltage, superficial, radioactive implant or application). These data were obtained from either the departmental log book or the individual patient treatment records.

The information on hospital income and expenditures was available only in aggregate form and was obtained from the hospital's fiscal records. Of the sampled hospitals, one provided no therapy during 1969; another that treated only 25 patients declined to furnish information on the disease categories of patients treated. The definitions of the financial terms used conform to standard accounting or economic usage.*

RESULTS

All the information gathered was separated into three categories — input, output and cost. The data on input are concerned with the facilities, equipment and personnel. The data on output deal with the patients, their disease and treatment. Financial data relate to the income and expenditure undertaken by the hospital. *The hospital cost is only concerned with the direct provision of radiation therapy.* It does not include inpatient costs. It does include costs of continuing or student education incurred by the department. Travel expenses or wages forgone by patients are also excluded.

Input

Table 1 shows the facilities and equipment avail-

From the Department of Preventive and Social Medicine, Harvard Medical School, and the Department of Community Medicine, University of Pennsylvania School of Medicine (address reprint requests to Mr. Bloom at the Department of Preventive Medicine, Harvard Medical School, 25 Shattuck St., Boston, Mass. 02115).

Table 1. Facilities and Equipment, by Hospital Group, 1969.

ITEM	HOSPITAL GROUP*					
	UNIVERSITY RELATED		OTHER TEACHING		NONTTEACHING	
	A	B	A	B	A	B
No. of hospitals	4	2	2	3	2	3
Facilities (ft ²)	12,865	475	2,200	1,060	5,113	1,870
Equipment:						
Supervoltage:						
Linear accelerator	2	—	—	—	1	—
Betatron	1	—	—	—	—	—
Cobalt	3	—	2	—	1	1
Orthovoltage	4	2	2	3	1	3
Superficial	4	2	2	—	2	1
Total capital investment	\$1,504,346	\$72,335	\$223,500	\$99,350	\$542,603	\$173,566

*A indicates high, & B low patient load.

able for the provision of radiation therapy and their 1969 cost. Table 2 shows the personnel and the cost for fiscal 1968-69. The larger treatment centers have more extensive facilities and equipment, a greater number and diversity of skilled manpower, a larger capital investment and higher personnel costs. In the hospitals with high patient loads, personnel costs are a far higher proportion of total costs than in those with low patient loads. The low-treatment-load hospitals provided their few treatments by borrowing personnel from the radiology department. There are few, if any, nonphysician personnel (physicists, dosimetrists and radiation technologists) to provide the complete range of services for patient treatment. In all low-patient-load hospitals, the bulk of the personnel cost is for the part-time physician and technician. The high-patient-load hospitals, with their greater diversity of staff, show a wider distribution of cost among the various personnel categories.

Output

In Table 3, the aggregate statistics on the total

number of patients treated, total treatments given and average number of treatments for each patient are presented. The range is from a low of 4.3 treatments per patient in a nonteaching, low-patient-load hospital to a high of 19.0 treatments in a university affiliated, high-patient-load major medical center. These differences are due mainly to the mix of diseases treated. The major medical centers treat more patients, including many malignant lesions, more difficult to treat, and give more treatments to each patient. The low-patient-load hospitals, in contrast, treat more benign growths and fewer problem cancers. The very large range in patients and treatments is striking.

Table 4 shows the patients' treatment status — whether treated on an outpatient or inpatient basis, and whether a first or recurrent course of treatment. The nonteaching hospitals, usually located outside the metropolitan areas, provide more primary treatment, whereas the teaching hospitals include a greater proportion of treatments for recurrences. The low-patient-load hospitals treat a larger proportion of their patients as outpatients, owing in large

Table 2. Number, Type and Cost of Personnel, by Hospital Group, October 1, 1968, to September 30, 1969.

ITEM	HOSPITAL GROUP*					
	UNIVERSITY RELATED		OTHER TEACHING		NONTTEACHING	
	A	B	A	B	A	B
No. of hospitals	4	2	2	2	2	3
No. of FTE† radiotherapists	7.5	0.15	0.75	0.1	1.8	0.22
No. of FTE physics personnel	5.6	0	0.8	0	0	0
No. of FTE technologists	11.0	0.25	2.0	0.3	4.06	0.5
No. of FTE all other personnel	11.5	0.45	0.55	0.35	1.375	0.1
Annual personnel cost	\$563,903	\$7,660	\$88,499	\$6,990	\$118,358	\$17,711
% of total cost	67.7	35.8	56.7	20.9	66.4	55.7

Table 3. Total Patient and Treatment Loads, by Hospital Group, 1969

HOSPITAL GROUP	PATIENT LOAD	NO. OF HOSPITALS	TOTAL PATIENTS	TOTAL TREATMENTS	AVERAGE TREATMENTS/PATIENT
University related	High	4	2,232	34,798	15.6 (13.2-19.0)*
	Low	2	151	1,450	9.6 (7.1-11.1)
Other teaching	High	2	545	5,766	10.6 (9.4-15.4)
	Low	3	56	810	14.5 (11.7-15.1)
Nonteaching	High	2	640	10,875	17.0 (13.8-18.7)
	Low	3	254	1,843	7.3 (4.3-11.1)

*Figures in parentheses are ranges.

measure to the treatment of many more benign conditions.

Table 5 shows that patients with malignant processes account for the bulk of all patients (83 per cent) and for an even larger proportion of all treatments (96 per cent). The range, by hospital group, however, is great — from 30 per cent to 98 per cent for patients and from 68 per cent to 99 per cent for treatments. Patients with cancer were characteristically given extensive radiation over two weeks or more, whereas those with benign conditions usually received one to four treatments.

Table 4. Percentage of Primary Treatment, Treatment of Recurrence, Inpatient and Outpatient, by Hospital Group, 1969.

HOSPITAL GROUP	PATIENT LOAD	NO. OF HOSPITALS	TOTAL PATIENTS	% PRIMARY TREATMENT	% TREATMENT OF RECURRENCE	% OUTPATIENT	% INPATIENT
University related	High	4	2,232	73.2	26.8	66.8	33.2
	Low	2	151	70.9	29.1	69.6	30.4
Other teaching	High	2	545	80.2	19.8	67.7	32.3
	Low	3	56	73.2	26.8	98.2	1.8
Nonteaching	High	2	640	89.1	10.9	77.7	22.3
	Low	2	229	93.9	6.1	97.4	2.6
All hospitals		15	3,853	77.9	21.1	71.1	29.9

In all the hospitals studied, with the exception of the nonteaching, low-patient-load ones, there is a great deal of similarity in the distribution of the malignant diseases treated (Table 6). In most hospitals, about 50 per cent of all patients were treated for three types of cancer — those of the lungs and breast and the lymphoma group.

mal profit, and two covered expenses. In seven hospitals income covered less than 50 per cent of costs. Five additional hospitals generated enough income to cover only between 1/2 and 2/3 of their cost. One other hospital met 80 per cent of its costs from income.

In 1969 there were 67 hospitals in New Hamp-

Table 5. Total Patients and Treatments, Percentage of Malignant and Benign Conditions, by Hospital Group, 1969.

HOSPITAL GROUP	PATIENT LOAD	TOTAL		% WITH CANCER		% WITH BENIGN CONDITIONS	
		PATIENTS	TREATMENTS	PATIENTS	TREATMENTS	PATIENTS	TREATMENTS
University related	High	2,232	34,798	94.8	98.6	5.2	1.4
	Low	151	1,450	55.6	86.6	44.4	12.4
Other teaching	High	545	5,766	65.3	87.7	34.7	12.3
	Low	56	810	98.2	99.5	1.8	0.5
Nonteaching	High	640	10,875	84.4	96.0	15.6	4.0
	Low	254	1,843	93.9	96.0	6.1	4.0

Table 6. Diagnosis, According to Site, and Percentage of Total Patients, by Hospital Group, 1969.

SITE	TOTAL PATIENTS (%)	UNIVERSITY RELATED (%)		OTHER TEACHING (%)		NONTTEACHING (%)	
		HIGH	LOW	HIGH	LOW	HIGH	LOW
Malignant:							
Oral	3.1	3.9	0	0.2	1.8	4.7	0
Pharynx	1.4	1.4	0	1.1	1.8	2.5	0
Gastrointestinal	6.7	8.1	2.6	5.5	10.7	5.1	1.7
Nose, ear, larynx	2.6	3.2	0	0.6	1.8	3.4	1.7
Lung	15.3	18.6	4.6	13.4	12.5	12.5	3.1
Breast	16.5	17.3	13.2	15.6	28.6	16.6	9.6
Female reproductive	8.5	9.9	2.0	6.8	5.3	9.4	1.7
Male genital	2.5	3.2	1.3	2.2	0	1.6	0
Kidney, ureter, bladder	3.9	4.1	0	4.0	7.1	4.5	1.7
Skin	4.3	3.4	2.0	3.5	3.6	7.2	7.9
Lymphatic system (lymphoma)	9.8	12.4	3.3	7.3	3.6	8.3	0.9
Other	8.9	9.2	26.5	5.1	21.4	8.6	1.3
Nonmalignant:							
All	16.4	5.2	44.4	34.7	1.8	15.6	70.3
All hospitals	100.0 (3,853)*	100.0 (2,232)	100.0 (151)	100.0 (545)	100.0 (56)	100.0 (640)	100.0 (254)

*Figures in parentheses indicate total patients.

shire, Massachusetts and Rhode Island that had facilities for radiation therapy. More than 65 per cent gave less than 1500 treatments per year.² Most of the equipment was for either superficial (40 units) or orthovoltage (65 units) treatments. There were 13 cobalt units, two of which were in low-patient-load hospitals. For very high-energy irradiation there was available one Betatron, three van de Graaf generators and four linear accelerators, all at high-patient-load centers.

The total investment and cost of operations of all radiation facilities in the three-state area has been estimated from the study sample data (Table 8).

The high-patient-load hospitals, 20 of the 67 hospitals with radiotherapy facilities, account for 60 per cent of the total investment outlay, provide 93 per cent of all treatments and incur 90 per cent of the annual costs in the three states. It is evident that average annual operating costs and investment are similar for all hospitals with low patient loads. This is due to similar facilities, equipment and staffing patterns. The high-patient-load centers show higher operating costs and investment. They have higher

staffing levels, larger and more complex facilities and equipment and deal with more problem diseases.

The cost of building and equipping the facilities, although large, is overshadowed by the total expenditures that will be incurred over the operating life of the unit. On the average, annual operating costs were equal to 64 per cent of total investment, with a range of 14 per cent to 151 per cent. The low-patient-load hospitals incur average operating costs equal to 17 per cent of gross investment, whereas in the high-patient-load centers, average annual operating expenses equal 75 per cent of gross investment.

DISCUSSION

This investigation has demonstrated large variations in input, output and cost of radiation therapy. Hospitals with similar patient loads and teaching functions showed little variation in investment in facilities and equipment and in personnel, but high-patient-load centers had capital investments three to five times greater than those of the low-patient-load

Table 7. Total Expenditures and Average Costs, by Hospital Group October 1, 1968, to September 30, 1969.

HOSPITAL GROUP	PATIENT LOAD	NO. OF HOSPITALS	TOTAL COST (\$)	AVERAGE COST/PATIENT (\$)	AVERAGE COST/TREATMENT (\$)
University related	High	4	832,706	374.93 (321.91-406.31)*	23.94 (16.95-30.20)
	Low	2	21,404	141.75 (132.97-156.63)	14.76 (11.97-22.21)
Other teaching	High	2	155,966	281.53 (260.08-396.79)	26.98 (25.79-27.53)
	Low	3	33,380	596.07 (449.82-513.73)	41.21 (29.72-43.81)
Nonteaching	High	2	178,628	288.58 (182.82-330.95)	16.41 (13.21-17.70)
				204.65	28.20

Table 8. Estimated Gross Investment and Annual Operating Costs of All Radiation-Therapy Units in New Hampshire, Massachusetts and Rhode Island, by Hospital Group, 1969.

HOSPITAL GROUP	PATIENT LOAD	NO. OF HOSPITALS	ESTIMATED TOTAL GROSS INVESTMENT \$	AVERAGE INVESTMENT/HOSPITAL \$	ESTIMATED ANNUAL OPERATING COST \$	AVERAGE ANNUAL OPERATING COST HOSPITAL \$
University related	High	8	2,557,000	319,625	1,974,142	246,768
	Low	12	806,000	67,167	116,560	9,713
Other teaching	High	10	1,137,000	113,700	1,722,475	172,248
	Low	14	597,000	42,643	136,158*	9,726
Nonteaching	High	2	491,000	245,500	178,628	89,314
	Low	21	1,205,000	57,381	191,140	9,102
All hospitals		67	\$6,793,000	\$101,388	\$4,319,103†	\$64,464

* Includes total cost of hospital unit that performed no therapy.

† Interest income foregone not included in any estimated costs.

hospitals. When the investment per case is compared, the differences disappear. These two factors, low investment and few personnel, allow lower utilization without any increase in cost per patient. This, however, limits the versatility and range of treatment capabilities as compared to the high-patient-load centers and may limit the range of patients who can obtain optimum care in the low-load hospitals.

In addition to the problems of financing and cost is the shortage of the personnel needed to direct and give radiation therapy. There are simply not enough physicians, physicists, dosimetrists and technologists in this subspecialty to treat the number of patients who could be expected to benefit from this therapy.²

In the low-patient-load hospitals, the diagnostic radiologists and other staff provide the radiation therapy on a part-time basis. The diagnostic radiologist must perform the functions of the physicist and dosimetrist and even of the technician. This represents borrowing of people who have other primary functions and is a poor utilization of a radiologist's time — not only because he is performing too many functions but also because it detracts from his primary function of diagnostic radiology. This lowers his productivity in both functions and also runs counter to the increasing trend to separate diagnostic and therapeutic radiology in training and in practice.

The diseases and conditions treated in the hospitals with high and low patient loads were quite different. The high-patient-load units treated larger numbers and percentages of cancer. The low-patient-load units treated many benign conditions, such as bursitis, plantar wart, keloid, tendonitis and epicondylitis. Equally striking was the small amount of radiation therapy given for benign conditions in the high-patient-load centers. One can only ask whether this was due to a lack of time on their schedules for minor diseases or whether they imposed different criteria for the use of radiation therapy.

At the high-patient-load centers, especially

is striking. The radiotherapists, who were aware of this fact, repeatedly stated that the appropriate hospital roles were reversed: the major treatment centers were often treating patients palliatively when they should have been providing the primary treatment, and the smaller hospitals were giving the primary course of treatment when they should have been administering palliation.

The final criteria for any treatment center is productivity, which not only involves volume but has a dimension of quality. The final case outcome is the best measure of quality. Do the more expensive high-patient-load centers produce more cures, longer survival or fewer complications? This study has no data on this question. However, Graham and Paloucek presented evidence that the survival rate was better in high-patient-load centers for patients treated by irradiation for cancer of the cervix.³ The superior result was attributed to the special physical facilities and equipment, a concentration of clinical material and the greater experience and skill of the staff. Thus, the crux of the question rests on the quality of the product and highlights the need for data on the results of treatment reflecting survival time and the quality of life during survival. With use of the criteria established by the Committee for Radiation Therapy Studies⁴ and the findings of Graham and Paloucek,³ it appears that the future course should be to strengthen the major centers and abandon the units with low patient loads.

The range of operating costs experienced by the individual hospitals was great. It costs three times as much to treat a patient in the most expensive high-patient-load center as in the least costly low-patient-load hospital. The high costs are due, as our data have shown, to the larger and more diversified staff giving radiation therapy. The treatment of more problem cases and the use of a great variety of equipment contributes to higher cost.

Within the homogeneous high-patient-load, university-related group there was also a large range of costs of therapy. There was a per-patient cost difference of 30 per cent between the least and most expensive hospitals. Within other hospital

... differences varied from 20 per cent to

be due to differing clinical techniques, staffing patterns, mix of diseases treated or actual management of the radiation-therapy units. If these cost differences are due to the management of the units, savings to the patient and the hospital can be achieved by application of modern management techniques and business practices to the operation of the units.

It appears that service industries in general, and the medical industry in particular, are characterized by low productivity and few economies of scale. As hospitals increase the scope and magnitude of their patient and treatment load, new and varied staff are added, the use of technology is intensified, and costs rise faster than output.

The use of radiation in the treatment of cancer has been expanding steadily for the past 75 years. Major advances during the past two decades have given rise to a greater demand for radiation therapy, further specialization of radiotherapists and more intensive use of facilities and equipment.

An important question is the number and type of centers needed to treat the expected patient load. Six hundred and thirty-eight patients were treated in the most productive center in the sample. However, in observing the utilization of facilities and equipment the opinion was reached that a substantial increase in productivity could be accomplished with little addition to personnel and costs. Although capital outlays are a small part of the total expenditure incurred over the operating life of the units, they can scarcely be justified for the treatment of few patients when other well equipped and staffed units have unused capacity.

Currently, there are 13 major treatment centers in Massachusetts, New Hampshire and Rhode Island. Nine are in the Metropolitan Boston area. Two of these are undergoing expansion programs that will greatly increase their capacity. The eight low-patient-load hospitals in the sample accounted for only

12 per cent of the patients treated for cancer. A minor expansion of the load of the major treatment centers could absorb this small load. Such rearrangement would correct the inefficient use of personnel in the low-patient-load hospitals.

In judging the location of major treatment centers, one must consider not only the cost of construction and operation but also the travel cost, travel time and loss of income by the patient. This argues against total centralization of radiation therapy, but obviously does not support the current practice of many hospitals operating at a low capacity with an inefficient use of personnel.

More than 95 per cent of the population in the Massachusetts, New Hampshire and Rhode Island area live within 80 km (50 miles) of a major facility. Five centers, located at existing institutions, would be a more appropriate number than the 67 currently in operation, with still more planned to come on-line in the immediate future. Four high-patient-load centers located at Hanover and Manchester, New Hampshire, Springfield, Massachusetts, and Providence, Rhode Island, along with the centers in Boston, could easily handle the entire patient load and meet the test of patient convenience.

We are indebted to the Tri-State Regional Medical Program for financial aid, advice and help.

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MEDICAL PROGRESS

THE BIOSYNTHESIS OF COLLAGEN (First of Three Parts)

MICHAEL E. GRANT, D.Phil., AND DARWIN J. PROCKOP, M.D., Ph.D.

INTEREST in the biochemistry of collagen derives in part from its abundance, in part from its unusual properties and in part from its likely impor-

tance in diseases of connective tissue. Collagen is probably the most abundant protein in the human body, and it is the major constituent of most connective tissues (Table 1). The other major components of these tissues are elastin, a related fibrous protein and the class of sugar polymers known as

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Louisiana Nurses Have Grant for Continuing Education

New Orleans, La.—The Louisiana State Nurses Association here has received a grant from the Louisiana Regional Medical Program to set up a statewide system of continuing education programs for nurses. Amount of the grant is \$100,000.

The program is administered by LSNA under the direction of Malcolm Martin, a specialist in community development, and seven regional coordinators, who must have degrees in nursing. The coordinators, located in Baton Rouge, Shreveport, Lafayette, Lake Charles, Alexandria, Monroe, and here, will assess local needs for continuing education and then will plan seminars and short-term courses to be conducted by universities and schools of nursing. Regional coordinators will work with statewide and regional advisory councils.

The grant expires in February, when the nurses association hopes to be re-funded or to obtain funding from the state legislature to connect the program with the state university system.

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L.P.N. to R.N. in One Year in New Alabama Program

Philcampbell, Ala.—Licensed practical nurses are now able to obtain an associate in applied science degree and become registered nurses in one year instead of two at the new Ex-

perimental Mobility Program at Northwest Alabama State Junior College.

Average age of the 30 students enrolled this year is about 40, according to Norma Ferguson, director of nursing. They are taking a heavy course load—18 hours a quarter, she said, and were required to

challenge the first level by examination. They take their clinical experience at one of five local hospitals.

The first year is funded by the State Board of Education, with matching grants of \$25,000 from the Alabama Regional Medical Program and the Manpower Training Act. An additional \$10,000 came from the North Alabama Hospital Council.

See last page (6)

IMAGE COMMUNICATION BY TELEPHONE

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A simple, inexpensive, reliable system for transmitting organ imaging examinations to remote locations would have many useful applications in nuclear medicine. In this paper we will review our experience with a method of transmitting radionuclide images to a distant location using slow scan television and ordinary telephone lines.

EQUIPMENT

Ordinary (real-time) television is suited to motion picture-type visualization of the happenings at a distant location. Nuclear images, including radioisotope scans and gamma scintigram pictures, generally are static; therefore it is not necessary that the capability of real-time television be present. It is possible to send images one frame at a time by a facsimile. However, facsimile does not lend itself easily to the format of the radioisotope scan. Generally facsimile is used with opaque material and is limited to a fixed size. Certain television techniques, however, are adaptable to transparencies such as are used in nuclear medicine and can also be used with various sizes and shapes of original material, whether transparent or opaque.

The method used in this study involved a slow-scan video system adapted for transmission over existing telephone lines. At the transmitting terminal, the equipment consisted of a television camera, television monitor, video converter (Colorado Video, Inc.), standard x-ray view box, and telephone data set (Bell 602C Data Set). The receiving terminal was equipped with a video converter and magnetic rotating disc storage device (Colorado Video, Inc.), television monitor, and an identical data set. The receiving video converter contained a video disc memory feature which allowed the transmitted image to be retained on the television monitor until the next transmission. The equipment was compact and could be housed in a small cabinet or desk top (Fig. 1). No special wiring except for the telephone was required. Simple telephone pickups and amplifiers were helpful for conference use. A zoom lens accessory for the television camera was used and was felt to aid in rapid adjustment for the various film sizes, reducing times of setup for transmission.

STUDY PROTOCOL

Ninety scintillation scan examinations were transmitted. The type of examination and the display material used are shown in Table 1. Before each transmission, a brief clinical history was given. The image was interpreted by the receiving physician with the interpretation being recorded. At a later time, the films were viewed directly with the same clinical information and another interpretation was recorded. The results of the telephone and direct interpretations were then compared and tabulated as positive for pathology, negative, or equivocal. Organ imaging examinations were recorded as "positive" when an abnormal cold or hot area could be identified on at least two views with anatomic correlation and the official interpretation recorded an abnormal finding. Renograms were interpreted as abnormal when one or both analog curves depicted a delayed peak (over 5 min) or a delayed excretory phase (over half the peak value at 15 min) and when serial scintiphotographs confirmed the sequence of events shown in the curves. "Equivocal" interpretations included organ imaging examinations in which variations in size and shape might be attributed to anatomical variation (usually liver and perfusion

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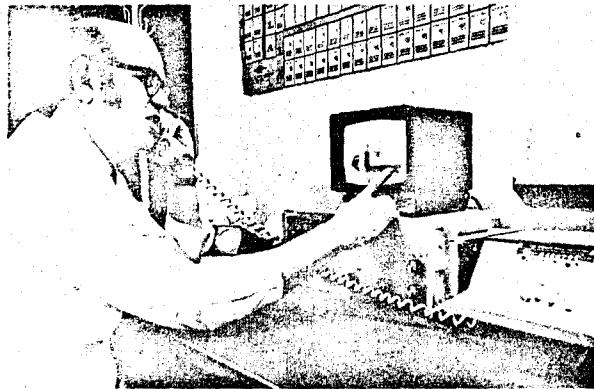


FIG. 1. Receiving terminal for nuclear medicine image communication system.

TABLE 1. TYPE OF EXAMINATION AND DISPLAY MATERIAL TRANSMITTED

Type of examination	No. of cases	Type of material transmitted	No.
Brain scan	57	X-ray film, 10 × 14	251
Liver scan	15	X-ray film, 14 × 17	70
Lung scan	8	Polaroid format	9
Renogram	6	Renogram graphs	5
Thyroid scan	2	Radiographs	2
Bone scan	2	Data sheet	1
Totals	90		338

lung scans) and probable artifacts or abnormalities seen in only one view. The official interpretation recorded the type of abnormality and usually suggested additional or repeat studies. "Negative" interpretations consisted of those examinations in which no abnormality was noted and the official interpretation was recorded as normal. The two interpretations of each scan were then compared. Observations were also made regarding the reliability of the system, resolution, photographic factors in the gamma images which made for best transmission, and cost.

The general routine was as follows: The initial telephone contact was made. A single view was transmitted (equipment takes 100 sec), after which verbal discussion took place using the talk mode of the data set while the image was retained on the receiving monitor. In practice, four or five patient examinations were transmitted and discussed in a period of approximately 1 hr. Much of the discussion involved the technique of scan performance and the diagnostic question posed by the particular examination.

The transmitted material included primarily radiographic films upon which scan images had been made (Table 1). It also included Polaroid displays, renogram graphs, some radiographs, and printed material. The use of a zoom lens permitted quick changes of film size between transmission. The television camera was used with a standard view box. No special masking was required.

In the course of this study, four 10 × 14 or two 14 × 17 transparency scans were generally grouped and transmitted at one time, which made it possible to transmit four views of a brain scan at once.

RESULTS

The comparison between the telephone interpretation and direct interpretation is shown in Table 2. In 68 of the 90 examinations, the two interpretations were the same. When both interpretations were positive, the abnormal features were identical; i.e., the positive interpretations were consistent. There were

no instances in which a positive direct interpretation had been preceded by a negative telephonic interpretation. In four cases a telephonic interpretation of "equivocal" was followed by a positive reading. Since, however, an interpretation of "equivocal" would be an indication for either direct viewing of the films or further examination, it was concluded that no significant abnormalities were missed during the interpretation of the transmitted images.

Seven examinations might be considered as "false positive" transmissions. One was read as abnormal by telephone and normal directly. Four were read as positive by phone and equivocal by direct interpretation. Seven were interpreted as equivocal by phone and negative when viewed directly.

EVALUATION

Comparison of the two methods of interpreting organ image examinations reinforced the authors' overall impression of the transmission technique, namely, that examinations transmitted in this manner can be interpreted promptly and with a degree of accuracy sufficient for clinical use. The resolution of the imaging instruments displayed on the actual films did not appear to be degraded in transmission since the abnormalities on all positive examinations were identical and no significant "false-negative" transmitted interpretations were rendered. Further experience in transmission technique and improved equipment should decrease the incidence of "false-positive" interpretations. The system was sufficiently flexible to permit transmission of material of varied composition and size.

Except for films of low contrast, all organ image examinations recorded on radiographic film were

TABLE 2. COMPARISON OF TELEPHONIC AND DIRECT INTERPRETATIONS

Interpretation		Phone	Direct
identical	68	Positive 32	32
Phone positive, direct negative	1	Negative 36	48
Phone negative, direct positive	0	Equivocal 19	10
Phone positive, direct equivocal	4	Technically inadequate 3	0
Phone negative, direct equivocal	0	Total 90	90
Phone equivocal, direct positive	5		
Phone equivocal, direct negative	9		
Phone technically inadequate:			
Direct positive	1		
Direct negative	2		
Total	90		

transmitted without difficulty. With proper magnification, 35-mm negatives could be transmitted. Scintiphotographs displayed on Polaroid film were successfully transmitted as were analog curves recorded during renograms. Gross features of selected radiographs could be transmitted, such as cardiac size on chest x-ray and isolated findings in contrast studies. The system was simple to operate at both the sending and receiving terminal. Nuclear medicine technologists were able to operate the transmitting terminal after approximately 1 hr of instruction. Setup time was minimal and the combination of zoom lens and television monitor eliminated the need for special masking. No transmission was cancelled because of equipment failure except for a period when telephone service at the receiving station was interrupted due to an earthquake. No maintenance was required during 4 months of regular use. Although cost figures were kept during the study, the special design of the experiment and recent changes in equipment rendered this information meaningless. Replacement of the data set with a standard voice coupler will reduce the fixed cost substantially, and toll call time undoubtedly would be shortened in a working situation. Even with the system as it was used, it was concluded that the cost was reasonable and within the budget of a moderately active department.

LIMITATIONS

Slow-scan television is suitable for static images only. However, serial images from dynamic studies can be transmitted in groups of six or eight frames. Cerebral flow studies and serial scintiphotographs taken during renograms were transmitted in this manner. The system was unable to detect and transmit small changes in image density at the white end of the gray scale, in spite of the contrast enhancement effect of minification. As a result some underexposed films or films of low contrast *could* be interpreted directly but could not be transmitted successfully, even though the minified image on the receiving monitor could be adjusted to a degree for contrast and brightness. Resolution was grossly inadequate for routine radiograph transmission. Accurate interpretation of printed material was limited to block lettering of 1 in. or larger. Further refinement in the equipment will probably enhance the capability to transmit printed material since the manufacturer proposes its use mainly for this purpose.

Distortion of the image and noise artifacts were occasionally bothersome but rarely prevented interpretation of the image. The type of artifact that was most distressing was an image of lesser intensity or of reversed gray scale which was occasionally seen

displaced downward from the main image. The appearance was not unlike "ghost" images which are occasionally seen in real-time television where more than one path for the radiofrequency picture signal exists. The artifacts could be eliminated on many occasions by breaking the circuit and reestablishing the connection.

FUTURE APPLICATIONS

The participants in this study have been encouraged by the technical capability of the system and intrigued by the teaching potential of a similar system. It is our hope that future studies of this sort will facilitate further the application of the university teaching center's special knowledge and experience in a community hospital setting. Additional formally structured teaching projects will be undertaken to explore this potential more fully. Improvements in equipment can be expected to result in improved resolution, faster transmission, and reduced costs. Improvement in the quality of the images should make it possible to transmit radiographs, photographs, and written or printed material. Improved storage devices may make it possible to store a series of examinations at the receiving end of the terminal to be interpreted at a later time. Smaller hospitals, especially those in remote locations, might wish to perform routine organ imaging examinations and arrange for immediate interpretation at a distant center. Several hospitals might be linked to a single center with the necessary trained physicians to provide expert interpretation, thus providing an important category of diagnostic service to a population of patients who otherwise might not receive this service, or who might have to be transferred to a point where the service is physically available.

SUMMARY

The investigators evaluated a slow-scan video system capable of transmitting static nuclear medicine scan images over the telephone line. The system was found to have potential for future applications in bringing nuclear medicine services to small, remote hospitals. The results of this study indicate that no positive examinations were misread. However, there was a tendency for television interpretation to be equivocal or positive when direct interpretation was negative. It was felt that the difficulties which were encountered in this initial use of the system could be overcome.

ACKNOWLEDGMENT

This study was made possible by a feasibility grant from the California Regional Medical Programs, Area IV, UCLA.

Moments to Live

By JOHN NEWHOUSE
Of The State Journal Staff

The doctor took one look at the unconscious woman who was brought in from a car wreck and said, "My God! Get her to Madison!"

The decision probably saved the woman's life.

Quickly, expertly, the emergency room people "stabilized" her, so that she hopefully would live through the trip to University Hospitals in Madison.

A few moments later, the wail of an ambulance split the calm of the small city streets as the woman who had only moments to live began a long journey toward recovery.

* * *

IN MADISON, Dr. Joseph A. Moylan is in his office. He's a traumatologist, a new breed of doctors coming into their own because so many persons are dying, needlessly, in these days of high speed cars and powerful farm machines.

His job is to make a quick assessment of the mangled and torn victims as the leader of a team of specialists, determining who'll do what and who'll do it first.

Maybe it takes a brain surgeon first, to push back death. Or an open heart surgeon. A urologist. Or a respiratory expert.

The traumatologist does some of the tasks himself, and other specialists are minutes away. He's got nurses at his command and

THE AMBULANCE driver hit the siren as he came into Madison. Cars pulled to the curbs. It looked as though he'd make it. He hated it when people died in his ambulance.

"You never get used to it," he says. "You just do the best you can."

It was a relief to deliver the woman alive. He turned and drove back home. Slow.

* * *

"SHE'S HERE," said the nurse.

over the phone, and Dr. Moylan went to the emergency room. The woman was in bad shape.

There were ugly wounds in her head. Her chest was caved in. She had a compound fracture of the left arm. Her stomach was distended, and Dr. Moylan suspected internal bleeding. A needle brought up fresh blood. But where was it coming from? The aorta? Or some organ?

More →

The Care
has to be
from minute,
to minute



And can she have a normal baby in the head as well?

If there was bleeding in the head, general anesthesia could kill her. If it wasn't operated on at the same time that surgeons sought to control other bleeding.

Dr. Moylan decided upon an angiogram. A radiologist threaded a catheter through an artery to the woman's heart, injecting a dye that was opaque so that it could be "seen" by the X-ray.

There was no bleeding in the head. The problem seemed to be the spleen, probably punctured by a broken rib.

The woman was wheeled into surgery. She was still living, but in danger of bleeding to death internally.

* * *

IT WAS THE second time she'd been in danger of bleeding to death.

It was a truck-car collision on Highway 26 and County N, says Milton Police Chief Donald Chesmore. The first thing they heard was a little boy screaming. Two women were dead. One, unconscious, was in the back seat, on top of the little boy.

"We put her in the ambulance."

"She came to once and sort of screamed, 'My, God! What happened? Where's my baby?' But it was more a gurgle than a scream. She had this gash in her throat. When we tried to stop the blood from the outside, it filled her mouth.

"We had to aspirate her all the way so she would not choke to death."

They got her to the first hospital in nine minutes, and roared back.

MORE

Thank God,
they had
the wit
to ship me
to Madison



DR. MOYLAN took out the woman's spleen. A bone man came in and worked on the fractured arm. One ear was almost torn off, and the gash in her throat could have left a bad scar. Dr. Moylan called in a plastic surgeon.

Knowing the tremendous back-up that he had was a comfort to Dr. Moylan. There's a neuro-surgeon on duty at the hospital 24 hours a day, seven days a week. Same with an open heart surgeon, and an orthopedic surgeon, and a urologist, and a respiratory physiologist.

"You find this kind of talent readily available at University Hospitals," says Dr. Moylan.

The respiratory physiologist often plays an important role.

"Frequently, even though the lung is not injured, the patient develops 'trauma lung,'" says Dr. Moylan.

"The lung doesn't do its work. The patient can die. There are things that can be done, but it takes a trained man and he's got to be there when you need him."

DR. MOYLAN TAKES comfort, too, in the care available after surgery.

"They live from minute to minute," he says, "and the care has to be from minute to minute. Car accidents often involve pulmonary contusion, a terrific blow to the chest, and a respirator may be needed."

Often it has to be regulated frequently, and quickly, if the patient is to live.

"I HAD A LOT of trouble breathing, when I finally came to," says Mrs. Mary Ann Carney, of Antioch, Ill. "It was all those broken ribs. I couldn't cough, and raise phlegm. For a time, they thought I might have to have a tracheotomy."

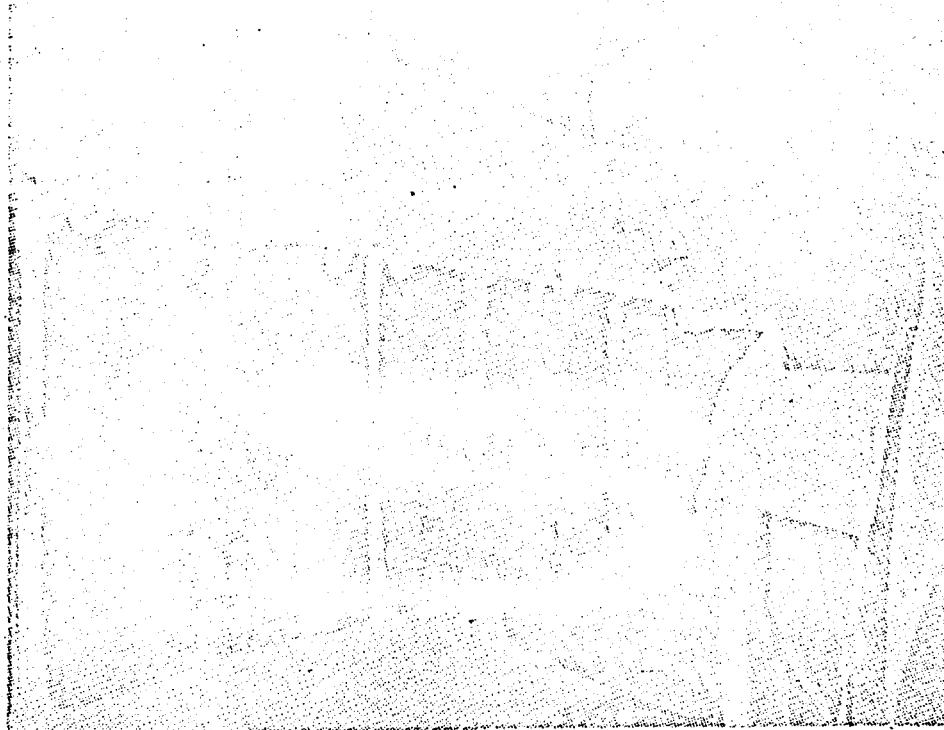
She remembered nothing of the accident. They've told her she was on a camping trip into Wisconsin with two other couples, and that they started out for town to buy some sausage about noon on July 3.

Bobby, her 3½-year-old son, pleaded with her to wear his football helmet. She gave in.

It probably saved his life when their car and a truck collided.

* * *

WANT TO KNOW MORE? Write to the



Dr. Moylan examines X-rays before deciding his next move.

some driver's part, says Chief Chesmore.

"Two dead women. Two teenage girls badly hurt. A car demolished. How do you put a dollar value on

(Continued on Page 3)

that?" he asks.

The National Safety Council in Chicago tries.

"We figure a mother with little children at \$44,900," says Robert Peszek, statistician. "You say the hospital bill of the woman who lived was about \$11,000? There's \$100,000 right there."

It cost Milton something, too.

"I went to the city fathers and told them, 'We gotta do something about that ambulance. It hasn't got any headrooms,'" says Chief Chesmore.

"Now we're leasing a van, until we can get some money, somewhere."

* * *

"I'M A NURSE," says Mrs. Carney. "Thank God, they had the wit to send me to Madison. I wouldn't be here to talk about it if they hadn't."

"Down here, in Illinois, if a person is bleeding internally, they don't open them up. They just wait, to see what's going to happen . . ."

(Illinois, however, is starting a trauma network, with 37 of the state's 365 hospitals designated for the special care.)

clearly demonstrated that central care of severe trauma patients has greatly improved survival, says Dr. Moylan.

The primary and the secondary hospitals usually don't have the manpower on deck 24 hours a day, nor can they afford the sophisticated equipment.

What they can do, if there is a tertiary hospital an hour or so away, is to stabilize the patient — staunch the hemorrhages, secure the airways, and start the intravenous fluids — for the trip to the larger hospital.

"In Europe, the trend is toward regional trauma hospitals," says Dr. Moylan, "and this trend is becoming apparent in this country."

MADISON IS CLOSE to the forefront. Los Angeles has a fine paramedical ambulance service. So does Seattle, Wash., where Dr. Moylan trained. And so does Jacksonville, Fla.

Before coming to Madison, Dr. Moylan was chief of the clinical division of the Ft. Sam Houston Army Burn Unit in San Antonio, where some 350 to 400 of the worst burn cases of

PAG
3
OF
4

More

Army personnel and their families are flown by DC-9 each year from all over the United States. * * *

"THE HARDEST thing,"

says Mrs. Carney, "was to talk with the man next door. His wife was one of the women killed."

She looks at her three children, and thinks how lucky

she is, and especially when she sees the teenaged daughter of the man next door. She looks in the mirror, and the ravages of the accident are barely visible.

"It's a fantastic hospital," she says. "Tremendous care, and so personalized, when I wrote my thank-you letters, I almost wrote to the small city doctor. I think I still will."

* * *

MRS. CARNEY isn't alone. Dr. Moylan gets the tough ones.

There was a girl from Portage, with 28 stab wounds inflicted by an unknown assailant.

There was a farm boy, pitched from a tractor and run over by a plow. The anal area was enucleated, literally scooped out to the abdominal cavity. There was an elderly man, victim of a gun wound, and two little East Side girls, badly burned when a pan of grease caught fire and the fire spread to their clothing.

And, with a program to better utilize the services of regional trauma centers under way, more and more of the most grievously injured persons will come to Madison and other centers, and more and more lives will be saved.

Maybe yours.

Firemen to Save Precious Time

If you can wait about a month for that car accident or heart attack in the Madison area, your chances of recovery may well be better.

That's because the hospital

emergency room — or an important arm of it — will come to you.

The "Emergency room" will be in the form of a Madison fireman, specially trained to start life-saving

techniques at the scene that normally have to wait until you get to the emergency room.

It will give you a better chance to live by saving time. And it will cut



Madison fireman John Kammer, right, inserts an intravenous tube (IV) in Charles Dirienzo as part of their training. Bernie Schmelzer, the instructor, and Carol Krebs, R.N., watch his progress.

—State Journal Photo by Edwin Stein

down on many a lights-flashing, sirens-on dash by ambulances.

It may also lessen the amount of discomfort by providing more rapid injection of pain-dulling drugs.

AS THE AMBULANCE speeds toward you, the fireman will get in touch by two-way radio with a standby doctor at University Hospitals. As the fireman looks you over, he'll be talking into a transmitter, telling the doctor what he sees in terms the doctor understands.

The doctor's "fireman eyes" will be professional enough so that the

It may be an airway. Many persons die for want of being able to breathe. If your heart is stopped, or just quivering instead of pumping in the condition known as ventricular fibrillation, the fireman will have medication that he can give you, in the form of shots, something he's not been able to do before.

And chances are that he'll have telemetry at his service, offering the ability to send your heart beat to the doctor so that he can see your electrocardiogram.

The doctor can tell a lot from the electrocardiogram, and the fireman

will have a half dozen pre-packaged drugs along with him which, under the doctor's orders, he'll be able to administer.

SOUND LIKE a dream?

It's not. The federal Dept. of Health, Education, and Welfare is interested in improving emergency room operation, with a view of cutting down on needless deaths.

Fifty-one applications were made for federal support for emergency care service. Five were granted. One

WOLF →

program that involves the Wisconsin-Madison Medical Program, the Wisconsin Hospital Assn., the University of Wisconsin, and other agencies.

There are some 16 projects under the three-year program, funded over the first two years at \$1.3-million. One of them is the program to make

firemen, under the direction of Dr. Claude Taylor, professor of anesthesiology at University Hospitals, working closely with Fire Chief Ralph McGraw, Training Chief Vincent Geier, and Communications Chief Donald Olson.

has been excused from duty to spend full time training in the new capacity. They started in September, and will put in 320 hours over two months at the hospital.

Then they'll go onto the field. They'll spend two more months in a

(Continued From Page 1)

training ambulance that will go out on calls with the firemen's rescue squads accompanied by hospital personnel to teach them in the field.

The two-way radio set-up will be in operation when they start. Negotiations are now under way for the telemetering of heart action, and this may be ready at the same time.

"IT AMOUNTS to supplementalization of training that is already at a pretty high level," says Dr. Taylor. "We wanted to start with a group with a high degree of competence. It's turned out that way.

"They make you glad they're the ones who are taking care of Madison."

The firemen have "moved in" with the hospital staff. They're under the guidance, a good share of the time, of Marilyn Dahle, a teacher, and Carol Krebs, a nurse instructor who has spent a lot of time in emergency room work.

The firemen are all over the hospital. They're in the operating room. They're learning respiratory techniques and watching babies be delivered. They're taught how to give shots and how to insert airways. They're learning how to start intravenous devices, and how a person looks and reacts when he's unconscious — what's normal and what's not.

They're dedicated, say the two young women, and now and then one looks sober and says, "I saw that out in the field. I didn't know what to do. If I'd known then what I know now..."

And you know he's thinking of a life that might have been saved.

ONE OF THE common causes of death before an ambulance can get to the emergency room is the stoppage of breathing.

"In about 85 per cent of the instances, breathing will start by itself if the head is positioned properly," says Dr. Taylor.



Fireman Gary Kreft inserts airway into dummy while John Trinkle and Bob Gessler look on. Dr. Claude Taylor is at right.

—State Journal Photos by Edwin Stein

— not from books, but by experience — how to do this.

Some, the heroin addict who dies before he gets to the hospital, died because they were breathing at the rate of once or twice a minute, not enough to support life.

And the firemen are learning how to cope with this.

The victim of a heart attack is not restricted to the person who is stricken in his home.

"A good many one-car accidents are caused either by heart attacks, with blackouts, or by alcohol," says Dr. Taylor.

AND, IF THE car accident victim is also having or has had a heart attack, the use of telemetry is particularly valuable. The fireman can continue the telemetering all the way into the hospital emergency room, on a portable set, and on to the intensive care unit.

If the victim is in pain, the fireman can administer morphine, if the doctor feels it wise. It can bring relief in 10 or 15 minutes.

can be used," says Dr. Taylor. "It makes diagnosis difficult, by clouding some of the senses."

When the first group of six firemen has been trained, a new group will start, with 36 the goal by the end of the year.

And the information will be disseminated. One additional hospital will be brought into the picture the first year. They'll share the program with 10 emergency rooms the next year, and 30 in the third year. They'll share a dozen or so video training films.

ONE OF THE jobs of the project will be to determine the feasibility of training the paramedical person, determine what sort of a person makes the best paramedic, what courses he should be taught, and where he should be taught.

While this is being done, hospitals around the state are being categorized into eight regions.

One day, the ambulance driver may send back heart beats to University Hospitals as he speeds from Park Falls to

Madison based doctor.

Or he may skip over a C and a D hospital to take a badly burned person to a B or an A hospital where the proper care is available.

"PROBABLY the most gratifying thing about the whole project," says Dr. Taylor, "is the spirit of cooperation on all levels — the University administration, the faculty, the nurses, the firemen, the hospitals, city and state agencies, private groups, the list is too long to name.

"It's once again an extension of the Wisconsin Idea, taking the University to all corners of the state, for the benefit of all people of the state."



ARKANSAS REGIONAL MEDICAL PROGRAM

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(AREA CODE 501)

JMB
9/24/73

C. W. SILVERBLATT, M.D., COORDINATOR

September 5, 1973

~~Dr. [unclear]~~
~~Dr. [unclear]~~ *RAA*
9/20
~~Dr. Pahl - RMPS~~

M E M O R A N D U M

TO: Mike Posta, Acting Chief
Mid-Continent Operations Branch
Regional Medical Program Service

Kenneth Endicott, M.D., Director
Health Resources Administration
Department of Health Education & Welfare

FROM: Arkansas Regional Medical Program

Even though the present administration is desirous of stigmatizing RMPS we in Arkansas are reminded daily of how our citizens have been helped. Enclosed is a recent article regarding Medical Technology training.

JW:lw

Enclosure

10/1/73

How a big city lab helps rural techs

By ODARE MURPHREE, MT(ASCP)

Little Rock, Ark.

Techs in Arkansas' small labs are not only unable to participate in continuing education, but frequently are undertrained to begin with. A Little Rock hospital lab is beginning to do something about that, though, with the help of a three-year Federal grant.

WHILE MAKING their consultation rounds among nine Arkansas rural hospitals, three of our pathologists reached a common conclusion: Laboratory techs in those hospitals simply needed more training. They saw, for example, one lab in which Coombs serum was added at the start of a crossmatch before the protein was removed, thus making it impossible to obtain an incompatible crossmatch. Another tech boiled Diazo reagent because he thought it should be yellow before being used in manual bilirubin procedures. Another lab staffer did prothrombin times by the sweep hand on the wall clock. Not all lab work in rural Arkansas is of this nature, but the fact remains that some labs have techs with little or no training.

In 1968, Baptist Medical Center made slight progress toward a solution by training three of these techs for one week each at hospital expense. We felt, though, that we were equipped to do much more than that. Ours is a 440-bed hospital

with an up-to-date lab employing 60 registered techs and performing 500,000 procedures a year. So in 1969, we applied for a Federal grant through the Arkansas Regional Medical Program, and at the same time spent \$20,000 to prepare a classroom in which to upgrade the training of rural techs. Our grant application received letters of support from the state health department's Bureau of Laboratories, the Arkansas Society of Clinical Pathologists, and the Arkansas Society of Medical Technology. Three years and three revisions of the application later, the grant was approved; it covered three years, effective July 1, 1972. We requested a total of \$79,538, which the Federal Government approved initially. However, with recent cutbacks in Federal spending, our grant period has been reduced to two years, and the total amount we'll get is closer to \$39,000. This has forced us to reduce the number of techs we planned to train each year from 40 to 20.

Nevertheless, the Federal money we've received so far has enabled us

to equip our classroom, pay instructors and clerical personnel, and pick up the travel expenses for instructors who hold seminars in small hospitals. And we now provide continuing education in hematology, blood banking, general and special chemistry, urinalysis, serology, bacteriology, and microbiology.

We've recruited our trainees through various professional publications and plain word-of-mouth. Most of them, despite the variety of courses we offer, have wanted to learn more about bacteriology; four of our present class of 10 are involved in this training, and 10 of the 12 on our waiting list have expressed interest in it. It's not surprising, because bacteriology—a demanding discipline with which most rural techs have only occasional contact—tends to be Arkansas techs' weakest area.

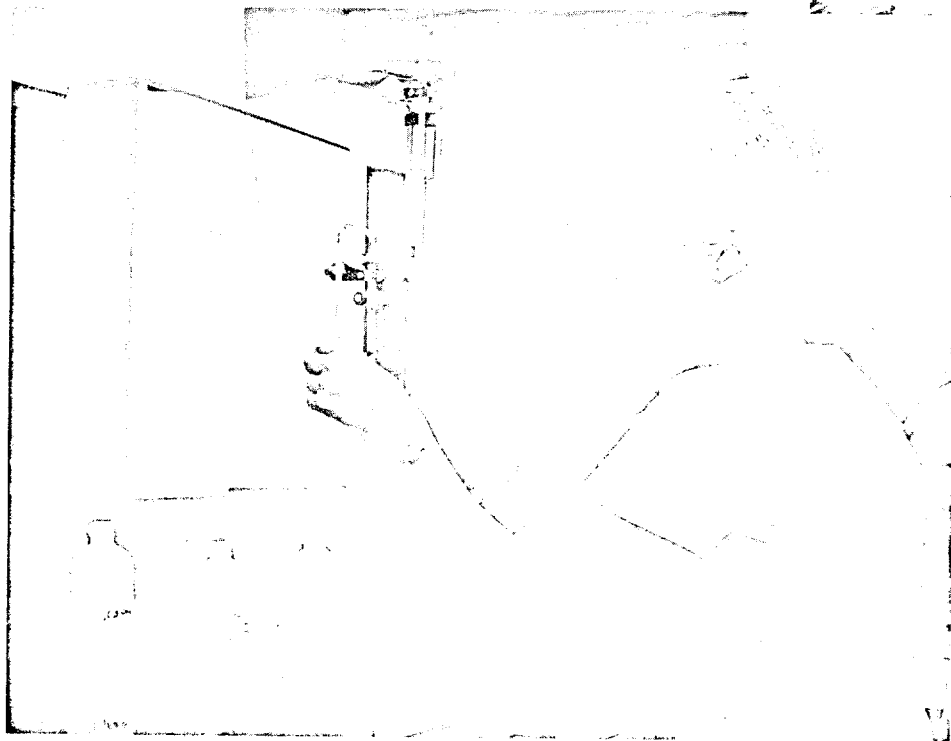
In bringing rural techs to our lab for training, we've worked out a rather unusual trade-off. Usually we're able to send a replacement to the trainee's lab to work there as long as the trainee is with us (one to eight weeks). Our replacements

The author is chief technologist at Baptist Medical Center.



During a two-week stint in bacteriology, trainee Don Dixon gets experience studying gram stains, coached by tech Barbara Monroe.

How a big city lab helps rural techs



Spending time in several lab departments, trainee Sheila Hurt performs a crossmatch (top) under the scrutiny of tech Julie Endsley, then tries her hand at a microgasometer.



Trainee Dixon watches as Mrs. Monroe reads culture plates. Bacteriology is the most-sought-after training.

are recently graduated techs, who generally have difficulty finding work in technologist-rich Little Rock. The small hospitals do their part by paying the replacement's salary and providing him with lodgings, as well as continuing to pay the trainee's salary.

It's well worth mentioning, incidentally, that the replacements have typically been enthusiastic about their experience in rural labs (though none as yet have elected to remain working in one). They find that, in contrast to their large-lab orientation with its emphasis on specialization, small labs want them to be generalists; they also find they have more direct contact with physicians and patients and are able to correlate lab results and patient care more closely.

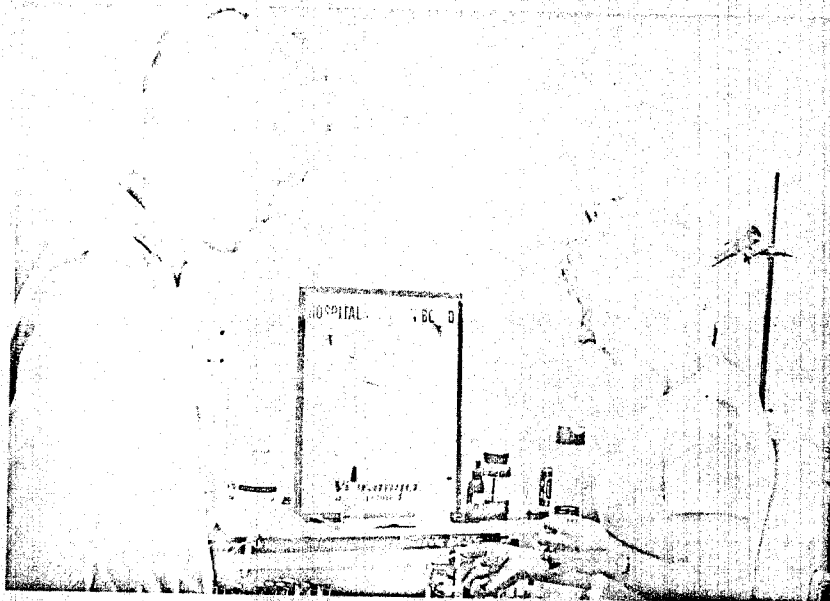
Our trainees are housed in rooms at the nurses' residence and take meals at the student-personnel cafeteria (the costs are borne directly by the hospital). They work at our lab in an apprenticeship situation from 8 A.M. to 4:30 P.M. daily, under the close supervision of a section chief or an experienced tech he appoints. Lectures and slide presentations are offered when needed, and the trainee has a reference library (financed by the grant) at his disposal.

Specifically, the trainees are taught to perform up-to-date procedures and operate modern equipment. For example, in bacteriology, trainees are given unknowns of stock cultures we keep on hand and are taught to identify bacteria and perform sensitivity tests. In hematology, the trainee studies a number of unusual slides under the dual microscope, with the assistance of a veteran tech, and is expected to identify the atypical cells on a blood

Big city lab helps rural techs



Techniques of blood typing, back typing, and crossmatching are reviewed by blood bank trainees.



As section head Laura Pierkowski stands ready to assist, Mrs. Hurt brushes up on urinalysis. Soon she'll return to her home lab.

smear. Blood bank trainees are taught to perform blood typing, including back typing, and cross-matches; serums containing antibodies are given the trainee, who is expected to identify the antibody in the incompatible crossmatch.

Our trainees come from diverse backgrounds. One, who had 15 years' experience in a small lab but no formal training, spent a week learning to identify atypical white blood cells. A former high school teacher, who became a tech with no formal training, spent two weeks in our bacteriology lab. Another, with a year's formal training after high school, spent a week at our blood bank. And a CLA who works in a physician's office learned basic bacteriology—especially the detection of beta-hemolytic streptococci in throat cultures—and quantitative analysis of urine cultures.

In some cases, small hospitals aren't able to send a tech to us—so we go to them. Thanks to the grant, we're able to send faculty instructors to present seminars at such hospitals upon request. There've been three so far—on red cell morphol-

ogy, coagulation testing, and white cell morphology (with an emphasis on unusual blood smears).

All our trainees are tested before and after their courses here, and so far they've shown remarkable improvement. Informally, we've heard many appreciative comments from the trainees, and have received several calls and letters from small-hospital administrators and physicians commenting on the improvement in their labs' work, thanks to our course. In time we'll perform a more objective evaluation based on our trainee "head count," the test results, comments from trainees and faculty, questionnaires sent to the trainees' employers, and semi-annual reviews by project officials.

Once the Federal grant expires, it's assumed Baptist Medical Center will continue this program at its own expense. By that time it shouldn't be costly, since our capital expenses will have been paid, and the main consideration thereafter will be our technologists' time. Based on our experience so far, and the needs that have to be met, we think it'll be time well spent.

A System of Continuing Medical Education

Based on Medical Audit

WILLIAM R. FIFER, M.D.

THERE ARE 5,000 physicians in Minnesota who are in clinical practice. As individuals they are solely responsible for maintenance of their clinical competence. As student, intern or resident, the physician devoted all of his attention to learning. Now his principal activity is patient care. To do this job well, he must constantly update his medical knowledge. Due to rapid infusion of new information from biomedical research, a physician's knowledge store has a half life of less than ten years. A physician who fell asleep like Rip Van Winkle ten years ago would not know about Rhogam, about ethambutol, about staging procedures for Hodgkin's Disease, about coronary bypass surgery, about amniocentesis, etc. Regional Medical Programs were created to close the gap between the Ivory tower and the practicing physician. Northland Regional Medical Program, like all Regional Medical Programs, has emphasized continuing medical education (CME) as the principal means to upgrade the quality of medical care. The basic question in CME is "Who needs to know what?" and we have begun to implement a statewide system of continuing medical education based on the determination of knowledge needs by review of actual patient care, medical audit.

Modes of Continuing Medical Education

How do physicians continue their medical education? First, patient care experiences are a vital learning resource. Second, consultations and daily contact with other physicians contribute greatly. Third, hospital staff meetings, medical and specialty society meetings provide new information. Fourth, continuation courses are provided in abundance. Fifth, reading medical books and journals continues to educate. Finally, innovative learning

methods such as medical television, tape cassettes and videotapes are available.

Although there is no organization of this series of random experiences, there is certainly more continuing medical education offered than any of us can use.

Learning Theory

Educators tell us that retention of knowledge depends on its utility and its relevance.

Educators also tell us that there is a "teachable moment" at which time we are maximally receptive to new knowledge. In clinical medicine we reach the teachable moment when we are confronted with a clinical problem. We then call a consultant, go to the library, or in other ways acquire a *needed* piece of information to solve the problem of John Smith. We will remember the problem and our solution long after we have forgotten the source of our information.

Identification of Continuing Medical Education Needs

Given an almost unlimited number of opportunities to learn, how does a physician decide what to choose? When we divide medical practice into *what we know* (knowledge) and *what we do* (medical care), the question becomes: What is it we need to know in the context of what we do? There are three currently popular means of determining needs: *self-assessment tests*, *individual practice profiles*, and *medical audit*.

Self-assessment examinations are now offered by specialty societies in many fields. The internal medicine examination is called MKSAP-II, and is sponsored by the American College of Physicians. It is divided into nine subject areas and may be taken either as a closed or open book test. The examinee, after taking this test, learns two things: (1) what he *knows* of internal medicine divided into nine categories, and (2) how he compares with his peers.

Individual practice profiles measure not what a physician *knows* but what he *does*. Developed by

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the University of Wisconsin Medical School, this technique is as follows: A physician carries a tape recorder with him for several days, recording information for each hospital visit, office visit, and telephone call. The tape is then analyzed and a report describing his *practice profile* is sent to the physician. Along with the profile, the physician receives an educational prescription which says "inasmuch as you do *these things*, you need to *know these things*." The University then lists those courses, meetings, lectures, etc., most pertinent to the knowledge requirements defined by his practice analysis.

Medical Audit is defined as a system of continuing medical education based on the evaluation of the quality of patient care as reflected in medical records. We feel that medical audit is superior to either self-assessment exams or practice profiles in that it demonstrates the application of medical knowledge to patient care situations.

The Minnesota Medical Audit Program is funded by Northlands Regional Medical Program, and promoted by the University of Minnesota program staff. Described as a "Feasibility Study of Medical Audit," the program began April 1, 1971 in five Minnesota community hospitals (Austin, Fergus Falls, Hibbing, Virginia and Worthington). These hospitals were selected because of their diverse geographic distribution and because they were relatively "closed systems" in which the medical staff-hospital relationship was well established. Their sizes range from 64 to 185 beds, and their medical staffs contain from 17 to 40 physicians. Altogether, they comprise 142 physicians and 663 acute beds.

To qualify for participation in the study, we asked each hospital to meet four conditions: (1) approval of the program by the governing board, administration and medical staff, (2) medical records information retrieval capability (four of our first five hospitals have PAS/MAP), (3) willingness to create an education budget to respond to identified educational needs, and (4) appointment by the medical staff of one of its leaders to work 20 percent time as director of continuing medical education (DCME). Northlands Regional Medical Program provided the funds for the DCME position. It was understood by the hospitals that NRMP financial support would be withdrawn at the end of the one-year study period. We felt that one year was adequate to determine the value of the medical audit program in terms of improved

patient care. Thus, we hoped to "set tops spinning" at a rate of five per year, and hoped they would keep on spinning after our seed money support was withdrawn. At present, four of the five will continue the program on their own, and we have begun working with four new hospitals. [Albert Lea, Fairview (downtown), Methodist (St. Louis Park) and St. Cloud] in the second year of the program which began April 1, 1972.

Methods

To implement our program, we have worked directly with the affiliated hospitals to assist their DCME's and medical staffs to establish a system of medical audit. In addition, we have conducted monthly medical audit workshops, an annual statewide hospital staff conference, and an annual continuation course on medical audit at the University of Minnesota. To establish an audit program in a hospital, we found it necessary to *teach the process* to the medical staff.

The *process of medical audit* involves six steps:

1. *Criteria must be defined* for optimum care of the disease or condition to be studied. If we study patients discharged with a primary diagnosis of diabetes mellitus, we set the recording of funduscopic examination for 95 percent of the patients examined as a criterion.
2. *Actual care must be reviewed* to display existing practice patterns. We may study 100 consecutive admissions for diabetes mellitus and find that 36 percent of the charts have funduscopic examinations recorded.
3. *Ideal vs. actual must be compared* to determine if a gap exists. In our example, the gap is between 36 percent actual performance and 95 percent optimal performance.
4. *Gaps must be translated into educational objectives* to form the basis for a continuing education program. In our example we state the objective in this way: "Following an education program on diabetic retinopathy, 95 percent of the charts of patients discharged with a primary diagnosis of diabetes mellitus will contain a recorded funduscopic examination."
5. *The education program must be implemented*. We may decide on a series of three presentations, one on classification of diabetic retinopathy; one a presentation of fundus photographs and/or clinical experience sessions; and one on photocoagulation techniques with laser beam.
6. *Finally, we must evaluate the program* at an

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appropriate interval. In our example, we study the next 100 consecutive records of patients discharged with a primary diagnosis of diabetes and determine the number of recorded funduscopic examinations. If actual performance remains at 36 percent, our program failed; while if funduscopic exams jumped to 82 percent, we caused a change in learner behavior.

What are the *requisites* for a hospital staff to perform medical audit? First, they must be *efficiently organized*. The common practice we encounter is *horizontal* review of care rather than *vertical* (holistic or patient-centered). We have often recommended a reorganization of medical committees with the anchor committee (called the audit or professional activities committee) systematically reviewing profiles of patient care.

Second a medical staff must have a medical records department capable of *information retrieval* on demand. If an audit committee of six men decides to study the management of diabetes mellitus by reviewing all the charts for one year, they might first decide what basic information should be recorded on *all* diabetes charts. This information can be quickly provided by the medical record librarian from the computer printouts (PAS/MAP). Then they might select for deeper study a certain group of diabetics which are displayed in groups on the computer printouts. Having decided to look at diabetes either broadly or at a specific problem in diabetes, the committee first sets *pattern criteria* for optimal performance, then goes to the records to see how actual care measures up to optimal standards. The information they need to review care may be divided into: (1) that which the medical record librarian can get from the PAS/MAP computer printouts (example: percent of funduscopic exams), (2) that which the medical record librarian can find by studying the chart (example: percent of diabetics taught foot care), and (3) that which requires medical judgment and hence review of the record by a physician (example: appropriateness of the surgical therapy of diabetic peripheral vascular insufficiency). In this way, the committee can systematically review the care of diabetics in their hospital to determine what continuing education in diabetes is most appropriate for their medical staff.

In *organizing* medical audit, *only* the medical staff can establish optimal standards. The medical records department prepares the displays of

actual care. The medical staff then performs the evaluative step by comparing the optimal with the actual level of care to detect gaps which may be closed by continuing education.

In addition to working with individual hospitals to assist them to institute audit, we have conducted monthly medical audit workshops using a "show and tell" format in which various hospitals present audits. Nurses were included initially, but now have split off into a separate group to develop nursing audits. We accept this split as a temporary expedient, and plan to bring the health team together by focusing on *patient-centered* (vs. professional-centered) and *outcome-oriented* (vs. process-oriented) audits.

In addition to the workshops we sponsored two more formal conferences: The first of these was the First Annual Minnesota Hospital Staff Conference in September, 1971. This two-day invitational conference was attended by management teams made up of trustees, administrators and key medical staff leaders from each of 27 hospitals. The theme of the conference was the quality of medical care in community hospitals. Its objective was to convince trustees that the responsibility for quality was legally theirs, and that they discharged this responsibility through the organized medical staff. We followed this up with a two-day continuation course at the University of Minnesota on the "how to" of medical audit in October, 1971, attended by 63 physicians from hospitals all over the state. We feel these companion efforts have helped to create a broad climate of acceptance of medical audit in Minnesota, and have developed a cadre of physicians capable of leadership.

Results

It is premature to evaluate the success of the first year's effort. We intentionally structured the program loosely to permit great diversity of activity among the participating hospitals. We felt the program would be more likely to succeed if it was their very own rather than a University program in their community. Because each hospital is so different politically and organizationally, the program took different forms at different sites.

Despite operational obstacles, and thanks to dedicated work by the DCME's and small staff committees, the first year's hospitals developed skills in medical audit, learned to develop their own pattern criteria, and learned to formulate education programs for the medical staff in re-

sponse to specific gaps identified by audit. They accomplished dozens of audits despite heavy patient care demands. Education programs were produced and when an outside speaker was employed, he was informed of the educational objective before he spoke to the staff. Time has not yet permitted completion of the audit cycle to see if the education resulted in change of physician behavior by re-audit of the disease or condition. We await these re-audits with great interest.

Subjects dealt with by the first year's hospitals included the use of antibiotics, anemia, diabetes mellitus, myocardial infarction, appendectomy, hypertension, duodenal ulcer, cholangiography, cholecystectomy, the use of tranquilizers, and urinary tract infection. In some instances data were pooled and shared by the hospitals.

Two hospitals, in auditing myocardial infarction, concluded that pacemaker capability was necessary for optimal care. As a result, members of each medical staff returned to the medical centers for training in the use of transvenous pacemakers. Another hospital, after auditing myocardial infarction, decided they needed to know more about serum lipids, and instituted a series of medical staff education sessions designed to improve their diagnosis and therapy of hyperlipidemia.

Audits of diabetes mellitus led one hospital to institute a series of educational programs on recent advances in the therapy of diabetic retinopathy. They selected this topic after discovering that only 34 percent of the patients discharged with a primary diagnosis of diabetes mellitus had their fundi examined. Another hospital concluded, after studying their diabetic care, that they needed to increase the use of other health professionals (nurse and dietitian) in the education of the diabetic patient.

Almost every audit disclosed room for improvement and indicated a specific behavioral change that was desired. The medical staff felt that an educational program would produce the desired result in some cases; in others, they chose a procedural or operational solution.

Discussion

We can generalize about a few things we learned in the first year:

1. Before action occurs, an attitude change must occur. We have seen a general acceptance of the peer review process, and of the concept that the organized medical staff is responsible,

as a group, for every single patient cared for in the institution.

2. Medical staff organization is a problem. The medical care appraisal function is spread about in many committees and each hospital must solve this problem in its own way. Some redesigned their committee structure, others left the committee structure essentially intact, and re-assigned functions. Common to all, however, was the perception of a *need to be organized* to accomplish the job of medical care appraisal.

3. The state of medical records is a problem. Since medical audit requires "the evaluation of medical care *as reflected in medical records*," the record becomes the key document. If the record is complete, legible and contains a concise discharge summary, the record librarian is able to abstract it for PAS/MAP. The latter step permits another chance for error, however, and we learned that the record abstract was often the weakest link in the information retrieval chain.

4. Definition of optimum criteria by the medical staff is a problem. They are much more inclined to simply "take a look at a subject and see how we're doing," without having first defined standards. The criteria committees often asked for "cookbook" standards developed by "the experts," and had to learn that the educational value of standard setting probably equals that of care evaluation.

In addition to continuation and expansion of hospital-based medical audit, we plan to extend our program activities this year. Beginning April 1, 1972, Northlands Regional Medical Program has funded demonstration projects to extend audit to: (1) the outpatient setting, and (2) the problem-oriented record. These new directions recognize and attempt to correct two limitations of hospital-based medical audit. The first is that hospital-based audit does not apply to the medical care which takes place in ambulatory settings. Three group clinics (East Range Clinic, Virginia; Nicollet Clinic, Minneapolis; and the St. Louis Park Medical Center, St. Louis Park) have been funded to carry out computer-based audits of outpatient care this year, and we look forward to their results with great interest.

Audit of the problem-oriented record attempts to correct a second deficiency of the conventional hospital medical audit—namely that it accepts the diagnosis as given, and is unable to critically study diagnostic process or outcome. By auditing *prob-*

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lems rather than *diagnoses*, we can set criteria for and evaluate the care of 100 consecutive admissions for *chest pain* or *headache*, or *jaundice*, etc. This strategy moves us closer to the real world of patient care and offers exciting opportunities for doctors to apply the educational process to their own logic sequence in patient management. Two hospitals (Bethesda Lutheran and Miller in St. Paul) began these demonstration projects on April 1, 1972, and we will be greatly interested in their results.

Summary

Northlands Regional Medical Program has begun to develop a system of continuing medical education based on needs demonstrated by the process of medical audit. This system offers the potential to: (1) increase the *relevance* of continuing medical education by relating it to patient care, (2) provide on-site learning experiences in community hospitals, (3) merge continuing medical education and patient care by making the community hospital a teaching hospital, and (4) above all, improve patient care through continuing medical education.

A Dialogue with Sir William Osler on Postgraduate Education

Critique of a Northlands Regional Medical Program

RUSSELL V. LUCAS, JR., M.D.

IT WAS A TYPICAL August night in Minnesota, sultry, wind gusting, sheets of rain assaulting my window and distorting the lights occasionally appearing in the inky black. I had labored some time, in vain, to prepare an evaluation of "A pilot project in postgraduate education in pediatric cardiology and neonatology." My friend Win Miller was acting like an editor. All creativity had escaped. I gazed vacantly out the window.

A rich warm voice projected from the shadows. "I had an interest in postgraduate education, perhaps I can help." I turned to see a tall slender man of impressive bearing. His black hair was beginning to recede, a full moustache adorned his upper lip, and his black piercing eyes were set off by full brows and an aquiline nose. Despite his appearance, he seemed a warm and understanding man.

Sir William Osler.

During the discussion that ensued, I had the wits to take some notes which I used later in recording our conversation.

Introduction

Sir William:

"Before we get down to your problem, what is the state of medicine these days?"

Author:

"Not too well if we take at face value what is described by the press, the 'lay medical journals', and politicians of all callings. They lament the widening gap between medical capability and med-

ical performance. We hear, for example, that 1/3 of recent medical school graduates fail to continue postgraduate training once they start practice.¹ Estimates suggest that 20-70% of all M.D.'s fail to participate significantly in postgraduate educational endeavors."²

Sir William:

"Things haven't changed much then! Let me recall what I thought about that at the turn of the century. Bear with me if I falter occasionally; you're aware that we don't remember what we write.*

If the License to practice meant the completion of his education, how sad it would be for the practitioner, how distressing to his patient.³

I was moved to sadness by a physician of my acquaintance who

crawled up on the bank and the stream left him there, but he did not know it.³

On the other hand, the country doctor who maintained his skills and utilized his opportunities for postgraduate education filled me with joy."

Author:

"You're implying that the physician, now as then, lacks appropriate motivation for continued learning."

Sir William:

"Some perhaps, but that's not the whole story. What about the professor, the medical school, who are bypassed by the stream of medical knowledge. I used to call that condition 'old fogeysm'.

Would you know the signs by which, in man or institution, you may recognize old fogeysm? There are three; First a state of blissful happiness and contentment with things as they are; secondly a supreme conviction that the condition of other people and other institutions is one of pitiable inferiority; and thirdly, a fear of change, which not alone perplexes, but appals.³

Are these signs of old fogeysm in today's pro-

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*Direct quotes from Sir William's writings are in references. Other comments are poetic license, but reflect the author's understanding of Osler's philosophy.

fessors and medical schools?"

Author:

"Yes, in some the condition is quite advanced."

Sir William:

"Then perhaps faulty postgraduate educational methods play an important role in the failure of physicians to participate in postgraduate educational opportunities."

Author:

"We thought so! In our design of a pilot study in postgraduate education in pediatric cardiology, we started with the assumption that faulty educational methods were a major factor. We believed that our own past efforts and others failed because they:

- a. did not identify the needs of the learner-physician;
- b. allowed little active participating by the learner-physician;
- c. too often provided a mass of unintegrated facts;
- d. did little to develop analytical abilities or judgment;
- e. did not allow the acquisition of new skills; and
- f. were seldom conducted in the physician's natural environment.*"

Sir William:

"Well, Well. What's necessary for good postgraduate education then?"

Author:

"We thought the following:

1. The specific needs of the practicing physician must be identified and the curriculum designed to meet them.
2. The practicing physician must actively participate in the learning process.
3. The postgraduate program must be personalized so that differing needs of individual physicians may be met.
4. A significant portion of the program must occur in the physician's local environment.
5. The program should be patient oriented.
6. The program must be conceived as continuing over the professional lifetime of the physician."

Sir William:

"I see. You're trying to switch from a teacher oriented curriculum to one that's oriented toward the physician learner. How did you go about it?"

Author:

"The Northlands Regional Medical Program, a federally funded, regionally directed organization

*Editor's Note: These several points apply to all phases of medical education!

liked the idea, modestly funded us, and helped us define the following goals:

1. Provide immediate postgraduate education in pediatric cardiology throughout Minnesota;
2. Established more effective methods of postgraduate education; and
3. Encourage local physicians to assume a larger role in their postgraduate education."

Sir William:

"You call \$30,000 a year modest! I recall when little more than twice that, \$70,000, was the total budget for all 11 Canadian medical schools.⁴ My apologies! Let's hear how you attacked those worthy goals."

Methods and Results

A. Utilization of the Crippled Children's Service Cardiac Clinic as a focus for Postgraduate Education

Author:

"Through the encouragement and cooperation of Dr. Mildred Norval, arrangements were made to utilize the crippled children's cardiac clinics as foci for postgraduate seminars. In our three year experience, thirty crippled children's cardiac clinics in nine Minnesota communities were utilized. In each of these clinics, 15-75 children with cardiac disease are seen. The clinics are staffed by pediatric cardiologists from the Mayo Clinic, St. Louis Park Medical Clinic and the University of Minnesota. A number of different educational programs were utilized in conjunction with the crippled children's cardiac clinics over the period of the pilot study as follows:

1. Informal lectures.

An eight session curriculum designed to meet the needs of the practicing physician in the area of pediatric cardiology was formulated and utilized. This gave the visiting pediatric cardiologist guidance for his discourse and eliminated the possibility he would talk about his favorite defect or his current research efforts. The lectures were given during noon lunch breaks at hospital staff meetings, in the early afternoon at the cardiac clinics, in the late afternoon at the cardiac clinics, and at night after dinner and in conjunction with county medical society meetings. The noon and early afternoon sessions were least well attended."

Sir William:

"Perhaps practicing physicians are still busy in their clinics and miss lunch."

Author:

"That's right. On the other hand, the late afternoon and evening sessions, though better attended, had a rather high percentage of inattentive physicians."

Sir William:

"Hypoglycemic and sobriety factors, respectively."

Author:

"Our next method was:

2. Patient oriented case discussions after cardiac clinics. These sessions allowed the physician to participate in the examination of a child with congenital cardiac disease and discuss the details of management. In one variation, patients with interesting and common problems were held over and presented to the physicians for their examination and discussion. This was a most valuable exercise if there were a small number of physicians. However, if more than 3 or 4 physicians attended, a great deal of time was wasted while each patient was examined and the sessions lost clarity and direction. For a small number, this type session was a most effective educational device. A second variation, useful for a larger number of physicians was to present the history and physical findings, review Xrays and electrocardiograms of a number of patients. Each case was the basis of discussion, often spirited, of the problems posed to the practitioner."

Sir William:

"That sounds better. The focus is now on the patient."

Author: "Our next approach was:

3. Physician attendance at the crippled children's clinic.
The practicing physician often visited the cardiac clinic to review the findings and management of a patient he had referred. This provided an opportunity to review thoroughly the physical findings and the natural history of the cardiac disease and its management."

Sir William:

"Now you're getting somewhere! You've re-discovered the perfect medical learning situation, the triangle of student-patient-teacher."

Author:

"This was unquestionably the best learning experience, but it takes one teacher for every student. That's an expensive method."

Sir William:

"Perhaps, but do all your teachers teach? I doubt it. Some won't. Others, who will, aren't asked. This looks like a problem money is not required to solve, but rather harmony and good will in our profession.

Medical men, particularly in smaller places, live too much apart and do not see enough of each other. In large cities we rub each others angles down and carom off each other without feeling the shock very much . . . as a preventative of such a malady, attendance upon our annual meetings is absolute, as a cure it is specific."⁴

Author:

"Perhaps then, even if some of our pedagogical methods were suboptimal, the fact they encouraged physician dialogue was most important."

Sir William: "Quite so."

Author:

"Sir William, your words about the isolation of physicians brings to mind a totally unexpected result of our educational efforts in the crippled children's clinics. It has to do with:

4. Education of allied health personnel in the Cardiac Clinics. Early in our program, the public health nurses and social workers in the cardiac clinics asked for educational sessions tailored to their needs. They were aware of the many problems faced by the community in providing the optimal environment for children with heart disease. Therefore, community school, hospital and public health nurses, social workers, and school administrators, teachers, and athletic directors were invited to special sessions at the close of the cardiac clinics. Brief explanations of congenital heart disease and rheumatic fever were given followed by a lengthy question and answer period. The discussions centered on the child with heart disease; his habilitation and rehabilitation, special school and activity programs required, his medical, dental and nursing needs, as well as the psychological stress imposed on the children and their families."

Sir William:

"Those are the things we doctors used to take care of."

Author:

"That's true, but most physicians today welcome this help. The major problem, as it is in all human affairs, is meaningful communication. We saw evidence that avenues of communication be-

tween the allied health personnel, parents, community physicians and medical center physicians were unclogged by these shared educational experiences."

Sir William:

"So you had 30 of these educational programs in nine Minnesota communities. How many students?"

Author:

"180 physicians, and 290 nurses and other allied health people."

Sir William:

"May I ask two critical questions. First regarding the scope of the program. I recall that I once said pediatrics was the best specialty, because children's ailments were too diversified to allow much specialization.⁵ But pediatric cardiology; isn't that splitting the hair pretty fine?"

Author:

"That we learned. The NRMP people thought so, too."

Sir William:

"Secondly, while the cardiac clinics were in the physician's community, they weren't really in his practice environment.

About the hospital centers all that is best and highest in the profession of medicine. In it, not in the medical school proper, not in the laboratories, not in the museums, we doctors live and move and have our being."⁶

Author:

"We recognized the validity of both of your critiques. Therefore, in 1970 we embarked upon a program to provide postgraduate education in the care of the sick infant in community hospitals."

B. In-service Training for Nurses and Physicians in Neonatal Intensive Care

Author:

"Several factors favored utilization of infant care as a focus for an in-service educational program for physicians and hospital personnel. These included the recent improvement in definitive care for infants born with serious cardiac defects and other congenital problems, the almost revolutionary improvements in supportive care for infants, the need for the acquisition of new technical skills, and new treatment philosophies in the care of infants. Further, since the infant has a limited response to illness, the techniques of medical care necessary for the infant with serious cardiac disease applied equally well to all who are sick. The goals of our in-service program were to:

1. Impart the knowledge and skills necessary to the recognition of the sick infant.
2. Provide the knowledge and skills necessary for appropriate therapy in the areas of oxygenation, heat control, feeding, acid base and electrolyte balance, treatment of infections, and treatment of congestive cardiac failure.
3. Provide the means to determine when a sick infant requires transfer to a specialized diagnostic and treatment center and the methods of optimal transfer of the infant.

An in-service training program, lasting one-half to one day was given in 21 hospitals. Each program was conducted by a physician and an infant intensive care nurse from the University of Minnesota Hospitals. Preliminary discussion between the visiting team and the community hospital personnel established the specific local situation and problems within the context of the above goals. In the 21 hospitals, 380 nurses, LPN's, and technologists and 45 physicians were served."

Sir William:

"I suppose it is still true that many of the new and specific medical facts and skills are soon obsolete."

Author:

"True enough. Important as these new facts and skills were, a more important consequence of the in-service programs was the establishment of improved communication among nurses, technicians and physicians. We also observed that the University nurse-doctor team improved their understanding of infant care."

Sir William:

"The teacher usually accrues the greater benefit in his encounter with a student."

Author:

"Evidence that improved patient care resulted from these programs can be found in several areas. Changes in nursing and hospital procedures were often instituted during and immediately after the in-service session. Several institutions sent one or more nurses to infant intensive care units for long-term training. Finally, there was a significant increase in the number of sick infants referred to neonatal centers in Minnesota and an equally dramatic improvement in their initial recognition, local care, and transport.

Sir William:

"These programs represent considerable effort. I'd be interested in knowing the participants."

Author:

"The NRMP through funding and by helping us to continuously refine our goals, and evaluate our progress. The Division of Crippled Children's Services, director, and clinic personnel, made the cardiac clinics possible. The Minnesota Chapter of the AMA, the Minnesota Chapter of the Academy of General Practice and the State Board of Health provided approval and support.

The County Medical Societies and the hospital staffs, provided their meeting times and facilities for our programs. The St. Louis Park Clinic, the Mayo Clinic, and the University of Minnesota, provided the teachers pediatric cardiologists and nurses for all the programs."

Discussion and Conclusions**Sir William:**

"It would appear you and your colleagues have achieved modest success in reaching your first two goals. You have carried postgraduate education into Minnesota. You also seem to have instituted some improved methods of postgraduate study.

But what have you done to encourage the physician to assume greater responsibility for his education? A physician should return to formal study for several months every few years. During all my tenure at John Hopkins, I held courses for practicing physicians.

To meet these good earnest students from all parts of the country, some of whom have been in practice fifteen or twenty years, stimulates ones optimism as to the outlook of the profession."³

Author:

"We must admit to failure in this regard, Sir William. In three years, only one physician availed himself of this opportunity to return to the University for one or two months, even with a modest stipend provided for study. Perhaps our offering was too specialized. Perhaps we did not "sell" hard enough. It may be physicians don't

wish to shoulder the responsibility for their own continuing education. Many it seems, hand over this most important responsibility to others, their societies, their journals, their medical schools."

Sir William:

"A little harsh, don't you think, on both student and teacher? As I once predicted, medicine in the U.S. provides the world's keenest inspiration."³

Author:

"Sir William, your life and writings reflect a remarkable sensitivity to the medical needs of your time. This sensitivity to your own era, accounts no doubt for your unusually accurate prescience of our present time. Would you care to predict what lies in store for medicine in the U.S. today?"

Sir William:

"Recall that I've said few men over 40 retain their creativity. It's been a while since I passed that milestone. Moreover, the mark of an old, perhaps wise, man is to know when to quit. However, an old fool seldom can resist the chance for a final word.

First, postgraduate medical education is too important to be left to the professors, or to the societies, or to the journals or to the government. It must be nurtured, like life itself, by each physician. He must accept all the help he can get, searching always for the defects in his knowledge, the faults in his reasoning.

I would encourage him in a keenly skeptical attitude . . . ever remembering Benjamin Franklin's shrewd remark that 'he is the best doctor who knows the worthlessness of the most medicines.'⁷

Second, all augers well for American medicine as long as it retains the excitement of discontent, the tumultuousness of conflict, the ecstasy of discovery, and the humility of commitment.

Finally, each physician marches to his own drum. Learn the beats of your colleagues, so as to understand them better, and to more fully appreciate your own beat."

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Self-Review Conferences: A Contribution to Problems of Continuing Education and Peer Review

E. WILLIAM ROSENBERG, M.D.*

Amid the increasing demands upon physicians both for more continuing education and for more control of quality of practice, there appears to be at least one bright spot. That is the increasing evidence that there are some relatively simple and painless maneuvers that may provide the profession with a solution that will satisfy both demands simultaneously.

Slee,¹ Eisele,² Brown,³ and Uhl⁴ among others have pointed out the feasibility of a process of self-correction based upon an improved perception of actual practice shortcomings. While described in varying terms, the essential process is as follows:

1. The local group of physicians choose some aspect of practice to consider.
2. The same group agree upon criteria of performance and outcome that would represent a desired level of practice.
3. The group review their recent work to see if these criteria are being met.
4. If they are, that subject is passed and a new one considered.
5. If they are not, discrepancies between ideal and actual practices are aired. A suitable program of self-improvement is begun and continued until actual practice is found to coincide with desired standards.

It can be seen that, in addition to a commitment to quality, such systems require as their two key elements: 1) a staff large enough and sufficiently informed to draw up adequate criteria of performance for each of the many areas of practice, and 2) a method sensitive enough to detect actual levels of practice performance.

Information about a staff's own patterns of practice is now available through the Professional Activity Study/Medical Audit Program (PAS/MAP) provided to client hospitals by the Commission on Professional and Hospital Activities (CPHA) in Ann Arbor, Michigan. The PAS/MAP service, although widely used in some parts of the country, is used by only a few hospitals in Tennessee and by even fewer in the 75 county region encompassed by the Memphis Regional Medical Program. The PAS/MAP reports can be obtained by even the smallest hospitals and we expect that Tennessee physicians will find this sort of information increasingly available as more and more hospitals install the system.

CREDIT AVAILABLE

1. The American Academy of General Practice awards physicians who participate in these informal conferences two hours of prescribed continuing education credit, provided they are scheduled 30 days in advance. If not, each physician who participates receives two hours of elective credit.
2. The American Medical Association has accepted these conferences as eligible on an hour-per-hour basis for credit under category four of the Physician's Recognition Award.
3. The Joint Commission on Accreditation of Hospitals has acknowledged that these conferences fulfill their revised requirement in continuing education, i.e. that the medical staff of a hospital "provide a continuing program of professional education, or give evidence of participation in such a program."

*From Memphis Regional Medical Program, 969 Madison Avenue, Memphis, Tennessee 38104 and The University of Tennessee College of Medicine, Memphis.

Without difficulty to all but the large, specialist-staffed hospital is the capability of deriving suitable internal standards for which to aim. The local definition of desired standards is not only a major part of the educational aspect of the program, it also seems to be vital in generating acceptance of the plan by most doctors. After working with such systems for almost twenty years, Slee has stated that doctors will rarely alter their previous patterns of practice to conform to any standards that they did not have a voice in setting.

A recent report⁵ of the AMA Council on Health Manpower identified this problem and indicated a special concern for the physician who either has little or no hospital contact or who practices in a small or unaccredited hospital.

SELF-REVIEW CONFERENCES

Very small hospitals are a feature of the 75 county Memphis Regional Medical Program region and also of Tennessee. Just over a year ago a program of what we are now calling "Self-Review Conferences" was begun as a cooperative effort of the Memphis Regional Medical Program, the Division of Continuing Education of the University of Tennessee Medical Units, and the Tennessee Chapter of the American College of Physicians. In the first twelve months of the program we have sponsored 61 of these conferences, and as we have gained more experience with them, have come to look on them as perhaps providing a measure of both standard-setting and internal review for the very small hospital staff.

Briefly, the mechanism of these conferences is:

1) A small group of physicians (who need not constitute a hospital staff) select some area of patient care to review.

2) They prepare three or four case abstracts, including details of how they managed their cases. Hopefully, no physician works up more than one case.

3) The Memphis Regional Medical Program is contacted. We find two qualified consultants who agree to study the case abstracts and critically review management in light of current medical thinking. The visiting faculty has been composed of both practicing specialists and full-time University of Tennessee faculty (in a ratio of three to one) who have been glad to do this without compensation.

4) The consultants, usually two, drive to the conference site and review with the local doctors how the patients were and might have been managed.

The conferences were begun (under the name "Advanced Clinical Conferences") as what we hoped would be a realistic way of dealing with two of the most common objections to conventional continuing education programs ("I can't get away," and "The programs aren't about what my patients need").

Discussing the management of actual cases instead of delivering prepared talks appears to meet both of these objections at once. The conferences are patient-related and thus clearly relevant. Also, by removing the need to prepare and deliver a lecture we have been able to broaden our potential faculty to include most of the practicing specialists in our region. Since these practicing specialists constitute about 50% of our physician population, it is possible to utilize this very large but underused group⁶ to provide a widely-dispersed faculty with a consultant/participant ratio averaging one to four. Table one shows the topics of conferences during the first twelve months of the program.

TABLE ONE: Topics of Conferences

Acute Chronic Hepatitis	Hypertension
Acute Myocardial Infarctions and Arrhythmias	Kidney Disease
Anemia	Leukemia or Lymphomas
Arrhythmias	Liver Disorders
Athletic Injuries	Management of Cardiac Arrhythmias
Breast Disease	Neurosurgical Injuries
Cardiology	Obstructive Pulmonary Disease
Cholesterol	Organic Phosphate Poisoning
Dermatology	Oncology
Diabetes	Pancreatic Disorders
Emphysema	Pediatric Neurology
Cigarette Smoking	Pediatric Problems in Dermatology
Endometriosis	Renal Failure
ENT	Ruptured Uterus
Exercise and Rehabilitation for the Cardiac Patient	Sexual Problems
Gastroenteritis	Sickle Cell Disease
Gastroenterology	Sore Feet
G. I. Bleeding	Summer Complaint—Diarrhea and Colitis
G. I. Disorders	Toxemia
Heart	Urology
Heart and Circulatory System	

Among the features of the program that pleased us were its low out-of-pocket cost (consultants travel and talk without compensation, except for their travel expenses), and

the increased personal contacts between rural practitioners and metropolitan consultants, and between practicing specialists and full-time faculty members. By and large, the conferences have been very well-received. Also, while the bulk of our program has consisted of interchanges between practicing generalists and specialist consultants, we have had meetings where a group of internists discussed appropriate cases with visiting consultants.

FUTURE PLANS

We hope that our decision to change the name of the conferences from "Advanced Clinical Conference" to "Self-Review Conference" was not just an exercise comparable to the widespread attempts to alter various corporate images by similar techniques. We believe we have enough experience with the program to have confidence in the mechanics of an informal, across-the-table conference between a local group and visiting consultants where it is the participants' own chart abstracts that are being discussed in front of the local colleague and visiting consultant alike.

There have been instances in which one or the other participant group were disappointed, usually either because a local group expected a lecture and was not prepared to really participate or when a consultant came and gave a lecture that a prepared group did not want. For the most part, however, the conferences have been conducted in an atmosphere that restores one's faith in old-fashioned words like "professional" and "colleague."

It must be emphasized that the initiative for the conferences comes from the local group, the choice of a topic is theirs, and the selection of what cases to present is made in-

dividually by participating physicians. These conferences thus do not raise any of the emotionally-induced hackles conjured up by the term "peer review."

Yet if the participants will start to think of the conferences as a place where they can effectively "self review" their practice habits rather than a place to "keep up," we shall have achieved a major advance. Williamson⁷ has clearly shown that keeping up and knowledge alone do not insure proper performance. By shifting the emphasis of the program toward an increased perception of patterns of patient care, we believe we can move from peripheral concerns about "how well-informed are the doctors?" to the crucial concerns about "how well are we taking care of our patients?"

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(EDITOR'S NOTE: Reference No. 1 is reprinted in its entirety as a special item in this issue of the JOURNAL p. 140.)

The Concept of Stratified Medical Care

Irving S. Wright, MD

There appears to be emerging a remarkable unanimity from both professional and public sources that medical service must be reorganized in the immediate future.

The simple approach which first occurs to some is to provide more funds in the hopes of quickly producing medical facilities and personnel and greatly improved medical service. Those who are experienced in this problem recognize that funding is indeed essential but that instant results are not to be expected. It takes years and not months to train physicians, nurses, and technical personnel. It also takes many months, often several years, to plan, fund, and develop new or renovated facilities and to assemble and pretest the rather complex equipment and units now considered essential for modern medical care. In order to provide quality care for large numbers of our population, considerable restructuring of the use of our resources will be essential.

For the past three years the Inter-Society Commission for Heart Disease Resources, under contract with the Regional Medical Programs Service (authorized under Public Law 89-239, section 907), has been developing guidelines for optimal medical resources for the prevention and treatment of the major cardiovascular diseases. Emphasis has been on identifying and defining those characteristics of the medical environment, eg, physical plant, equipment, personnel, training, staffing patterns, administrative structure and other significant components required for the practice of cardiovascular medicine of high quality. Attention has also been drawn to the prohibitive waste of ma-

terial and manpower resources involved when several hospitals located in close proximity develop highly complicated services such as open-heart surgery, coronary-care units, advanced radiation and angiographic sections when the case load indicates that a single unit could handle all cases more efficiently. The approach has been to review all pertinent medical literature and to draw on the life experiences of the approximately 150 members of the commission to provide a set of authoritative guidelines regarding the *resources* and *mechanisms* which will be essential as we face the future. These reports have appeared serially in *Circulation* (May-July, Dec 1970; Jan-Aug 1971) and periodically in some other journals and, judged from the great number of requests for reprints and further information, they have proven to be of value. Their content will not be reviewed in detail here.

Of particular interest has been the spontaneous and independent development of a concept which has been designated as the *system of stratified care*. Stratified care requires that a community's total medical resources, including in particular its hospitals, are organized in a system in which each plays a separate but essential role. Such divergent categorical study groups of the commission as those devoted to congenital heart disease, coronary heart disease, and pulmonary heart disease working independently came to the same conclusions—that within the present framework of medical practice with all of its variations, or with any conceivable new system for the future, present and future resources must be used more efficiently and that this will require a stratified system to be effective. The patient load demands this, and modern technical advances require plan-

ning on a regional and community basis of an order never heretofore adopted in this country. With the necessary regional or community planning, the medical facilities will be recognized as possessing at least three major levels of capability for serious illness, emergency life-support units, special-care units (coronary, pulmonary, intensive), with continuation-care facilities, and regional reference centers. The planning will require (a) careful differentiation of function based on the categorical needs and the capacity of the facility and (b) a close interrelationship between the participating personnel and facilities at all levels.

Type I Facilities.—Using as an example the middle-aged man who develops an acute myocardial infarction, stratified medical care should operate as follows: No longer does he lie at home awaiting the turn of fate. His introduction into the system, which may be termed type I facilities, may come through his primary physician who, once the diagnosis seems probable, directs him to the emergency room of the nearest well-equipped hospital. If a modern ambulance with life-support equipment or a more elaborate mobile coronary-care unit is available, so much the better. But time is of the essence and delay may forfeit the opportunity of life preservation. The physician, if he is well equipped, may provide life-support emergency care, including monitoring, administration of lidocaine and other drugs, and chest massage, or even direct-current conversion. Many times, however, the patient is not near his physician, but today there should be a *life support heart station* activated whenever large numbers of people are congregated and where heart attacks occur frequently, and often sudden deaths. Examples should include all hospitals whether or not they have coronary-care units, industrial plants and large offices, airports, stadia, and race tracks. In such stations, emergency lifesaving measures may be taken prior to moving the patient to the hospital emergency rooms. Modern emergency rooms must be fully equipped and staffed with personnel trained to deal with myocardial infarction—the number one cause of

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Adverse Reactions—Drowsiness, lethargy, headache, diarrhea and other gastrointestinal symptoms, maculopapular or erythematous cutaneous eruptions, urticaria, mental confusion, drug fever, ataxia, gynecomastia, mild androgenic effects, including hirsutism, irregular menses and deepening voice. Adverse reactions are infrequent and usually reversible.

Dosage and Administration—For essential hypertension in adults the daily dosage is 50 to 100 mg. in divided doses. Aldactone may be combined with a thiazide diuretic if necessary. Continue treatment for two weeks or longer since an adequate response may not occur sooner. Adjust subsequent dosage according to response of patient.

For edema, ascites or effusions in adults initial daily dosage is 100 mg. in divided doses. Continue medication for at least five days to determine diuretic response; add a thiazide or organic mercurial if adequate diuretic response has not occurred. Aldactone dosage should not be changed when other therapy is added. A daily dosage of Aldactone considerably greater than 75 mg. may be given if necessary.

A glucocorticoid, such as 15 to 20 mg. of prednisone daily, may be desirable for patients with extremely resistant edema which does not respond adequately to Aldactone and a conventional diuretic. Observe the usual precautions applicable to glucocorticoid therapy; supplemental potassium will usually be necessary. Such patients frequently have an associated hyponatremia—restriction of fluid intake to 1 liter per day or administration of mannitol or urea may be necessary (these measures are contraindicated in patients with uremia or severely impaired renal function). Mannitol is contraindicated in patients with congestive heart failure, and urea is contraindicated with a history or signs of hepatic coma unless the patient is receiving antibiotics orally to "sterilize" the gastrointestinal tract.

Glucocorticoids should probably be given first to patients with nephrosis since Aldactone, although useful for diuresis, will not directly affect the basic pathologic process.

For children the daily dosage should provide 1.5 mg. of Aldactone per pound of body weight.

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death in this country. It is no longer acceptable to have staff rotation which results in a urologist or dermatologist being on duty, unless he too is specially trained to meet this type of emergency. As the patient reaches the emergency room, the coronary-care unit or the intensive-care unit must be alerted, so that the patient can be moved there as the next step.

Type II Facilities.—The next step has been designated as a type II facility. The specifications of this unit have been described in detail in the ICHD report of May 1971.¹ The decision as to whether or not a hospital should have a coronary care unit should be based on (1) the adequacy and availability of other community facilities providing coronary care, (2) the availability of sufficient qualified and dedicated physicians and nurses and allied health personnel to staff the facility, and (3) the number of patients admitted annually with suspected acute myocardial infarction. Hospital size alone should not be the determining factor in the decision to establish a coronary care unit. This important and always costly decision should be made only after analyzing the medical needs of the community and the most productive role for the hospital in the community system of coronary care. When the patient has reached a plateau of stability and has passed beyond the acute phase of his disease, he should then be moved into an intermediate care unit—or not far from the coronary-care unit—where he can be observed, monitored, and treated, as necessary. After several weeks, he should be ready to return home to the care of his primary physician, who may or may not have followed him throughout his entire course, depending on geography, interest, and other factors. All of this can be carried out in a well-equipped community hospital.

Type III Facilities: Regional Reference Center Hospitals.—The patient, however, may have developed a ventricular aneurysm or have intractable angina or some other serious complication. If he happens to have been admitted initially to a regional reference center hospital or type III facility, angiocardiology, including cineangiograms of the coronary arteries, can be performed and corrective surgery undertaken. If, on the other

hand, he had been admitted to a community hospital which provided excellent care for his myocardial infarction but was not equipped for special studies of this type, he should be transferred to a reference center for this study and surgery. Regional reference centers should (1) assist with regional or community planning for the stratified system of care, including the development of quality control for emergency vehicles, life-support units, and coronary-care units; (2) provide consulting services for physicians and other hospitals and units within a region; (3) assist in developing continuing education and training programs in cardiovascular diseases for physicians, nurses, and allied health personnel; (4) serve as centers for data collection, analysis, and possibly registry of patients with selected cardiovascular diseases for administrative and epidemiologic study and evaluation; and (5) conduct research in cardiovascular diseases. Many of them will be related to medical colleges but other major medical facilities may, if well staffed and equipped, act as reference centers.

Stratified care of a similar type is in fact in operation in some advanced areas in this country, but it is almost entirely operating informally and is limited in scope. Therefore, many patients fail to benefit from it, and there are frequent delays which, in some cases, are hazardous.

It now comes through clearly that there is an urgent need for such plans of operation to be established in all regions and communities; they should be developed on a regional or local basis by the joint effort of the physicians, community, and hospital administrators, together with public officials, including the Regional Medical Programs Service and other public health officials, county medical societies, American Heart Association affiliates, and all other interested parties. The need for planning and cooperation between hospitals becomes preeminent. It can no longer be recommended or supported that each hospital provide identical competitive services in an isolated and autonomous manner without regard to the needs of the community or the programs and plans of other institutions in the same or adjoining communities. This approach is simply too

wasteful of manpower and all other necessary resources. The plans of operation should be familiar to the physicians before the fact of the patient's heart attack—or before a new baby turns blue. Of equal importance, the public should be educated to recognize the signs and symptoms of serious disease and what steps they should take to enter the systems of stratified care. Patients might prefer to do this under the guidance of their primary physician, but in his absence or inability to provide this type of care, the patient should know what steps to take so that delay will not be too costly. Communication at each level should be easy: patient to doctor or life-support station—doctor and life support station to emergency room—to coronary-care unit—to reference center for consultation. In modern settings, two-way closed circuit television is already being used for the demonstration of electrocardiograms, x-ray films, and other pertinent data, thus permitting excellent consultation services even at considerable distance.

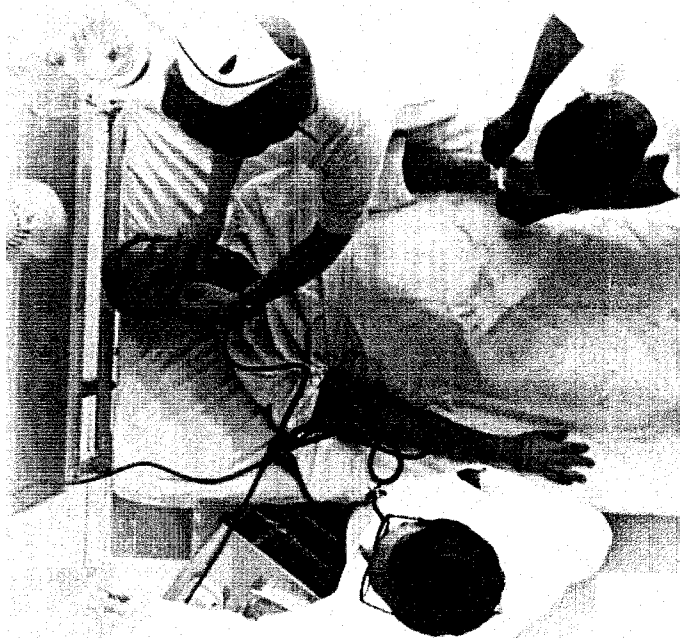
While the problem of myocardial infarction has been used as an example in this discussion, the concept of stratified medical care should be applicable to all types of serious illness requiring advanced equipment and personnel. Other examples might well include cancer chemotherapy and radiation, gastrointestinal hemorrhage, acute respiratory failure, and stroke.

This is all happening in a few areas at present. It will be generally applied in many areas in the future. The challenge of the medical profession is to take and to hold the leadership in this movement. If the physicians turn away or fail in this regard, others less qualified will begin to control this type of operation. The ICHD is providing expert advice which is available to all. The application of these guidelines is a formidable but essential task for the present and the foreseeable future.

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MEDICAL PROGRESS

THE GENITAL MYCOPLASMAS

WILLIAM M. McCORMACK, M.D., PETER BRAUN, M.D., YHU-HSIUNG LEE, M.D., JEROME O. KLEIN, M.D., AND EDWARD H. KASS, M.D., PH.D.

INTRODUCTION AND HISTORICAL ASPECTS

ALTHOUGH the first isolation of a mycoplasma from a human being, a patient with a genital infection,¹ was reported in 1937, it is only in the past few years that convincing evidence has appeared linking these organisms to disorders of the human genital tract. Genital mycoplasmas have now been associated with nongonococcal urethritis, acute salpingitis, abortion, post-partum fever and, most recently, with low birth weight. This review will attempt to evaluate critically the role of the genital mycoplasmas in human disease and to indicate areas of future investigations.

Mycoplasmas were prominent in veterinary medicine long before they were implicated in diseases of man. Contagious bovine pleuropneumonia has been recognized for centuries,² and the causative agent was grown on cell-free medium in 1898.³ This organism, now known as *Mycoplasma mycoides*, was the first mycoplasma to be isolated. As similar organisms were isolated, they were called pleuropneumonia-like organisms (PPLO). The term mycoplasma was suggested by Nowak⁴ in 1929.

In 1935, Klieneberger⁵ reported a series of organisms that she had isolated from various sources. She termed these isolates L₁, L₂, L₃, etc., for the Lister Institute where she was working. Most of these isolates were shown to be animal mycoplasmas. However, the L₁ organism, which was isolated from a culture of *Streptococcus moniliformis*, was eventually shown to be the first example of a cell-wall-deficient bacterial variant. These variants, now called protoplasts or spheroplasts,

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in accordance with certain of their properties, or simply L-forms, resemble mycoplasmas in colonial morphology on agar and also lack a cell wall. Despite these morphologic similarities, such cell-wall-deficient forms are related to their bacterial parents and are unrelated to the mycoplasmas.

In 1937, Dienes and Edsall¹ grew a PPLO in pure culture from a Bartholin's abscess. Since then, mycoplasmas have been found to be common inhabitants of the oropharyngeal and genital mucous membranes. There are now eight recognized species of human mycoplasmas. *M. pneumoniae* is responsible for cold-agglutinin-positive, primary atypical pneumonia.⁶ *M. salivarium*, *M. orale* Type I, *M. orale* Type II and *M. orale* Type III are oropharyngeal commensals and have not as yet been implicated in any pathologic process. *M. hominis* and T-mycoplasmas are the principal mycoplasmas that have been isolated from the human genital tract and thus will be the subject of most of this review. *M. fermentans*, an infrequently isolated genital mycoplasma, will also be considered.

Technics for cultivation and identification of the genital mycoplasmas have improved, so that the clinical studies must be evaluated against the background of improving methodology. Most studies before 1955 and many later reports refer to PPLO. Most of these isolations probably represented *M. hominis*, although cell-wall-deficient bacterial variants, *M. fermentans*, artifacts of cultivation (pseudocolonies) and even T-mycoplasmas may have been included. In this review, the term PPLO is used if that was the designation chosen in a cited study. If the organisms were classified, the appropriate species designation will be used. In general, also, the term T-mycoplasma will be used to indicate the T-strains of Shepard.⁷

BIOLOGIC CHARACTERISTICS

A detailed analysis of the biology of these organisms is beyond the scope of this review. Several recent publications present detailed biologic and biochemical information.⁸⁻¹¹

have not been followed. Units have been replicated without attention to nearby facilities and without consideration for the diseconomies created by the high costs of staffing and running units.

A 1969 study by the Tri-State Regional Medical Program staff concluded that the capacities of coronary-care units in its area were sufficient to care for all the anticipated cases of myocardial infarction, as well as another 30 per cent of patients "suspected" of having an infarction, or those with false-positive diagnoses of infarction.⁵ Between the publication of that report in late 1969 and 1971, the capacity of the units increased by 27 per cent.¹² This study has demonstrated that about half the patients treated in the units do not have myocardial infarctions. A few of these are "suspected" of having infarction and should be admitted to the units, but most have a variety of cardiac and other diseases; they are a low-risk group for whom expensive intensive care seems scarcely necessary. The cost of coronary-care units is very high if it is allocated to the patients having or "suspected" of having a myocardial infarction, who presumably benefit from this care. This high cost has naturally been passed on to Blue Cross, to Medicare and Medicaid and ultimately to the consumers and taxpayers. The absence of any constraints on costs and encouragement of economies is evident. It now remains to examine the scientific basis for this expensive care.

The clinical reports that stimulated the provision of intensive care for patients with myocardial infarction were based upon the comparison of death rates before and after institution of coronary-care units. The problem with this kind of evidence has been succinctly stated by Bradford Hill: "It is rarely . . . that one can feel wholly sure that these past observations *do relate to a precisely similar group of patients*. This is a most difficult thing to prove . . . yet it is the *sine qua non* if the comparison is to have any validity [*italics added*]."¹³ Before-and-after comparisons are inadequate proof of treatment effectiveness in the 1970's, as they were, indeed, in the 1960's, when intensive-care units were being started in great numbers. Coronary-care units were quickly accepted by clinicians as good clinical practice. The attitude that randomized clinical trial of intensive coronary care was unnecessary and unethical had become common by the end of the 1960's.

This unsatisfactory state was punctuated in 1971 by the report of a randomized clinical trial conducted by Mather et al.¹⁴ In this comparison, patients with myocardial infarction randomized into home care had slightly lower, though not statistically significant, case fatality rates than those randomized to hospital coronary-care units. In a second, nonrandomized Scandinavian study by Hofvendahl,¹⁵ patients were allocated to intensive care or ward care entirely on the basis of bed availability. The results of this study show a statistically significant advantage for the patients receiving intensive care. Clearly, when the most rigorous study shows no advantage for intensive care and another less rigorous but carefully conducted study disagrees, the

issue of the effectiveness of intensive care is not settled. Under these circumstances, randomized clinical trials to settle the efficacy of expensive care are not unethical. Is it ethical to spend scarce medical dollars on unproved treatment when these funds could be used in other areas where medical care is known to be effective? The uncontrolled growth of this expensive and unproved treatment stands in marked contrast to the requirement for proof of effectiveness before a new drug is allowed on the market.

Since it will be a long time before the question of effectiveness of coronary-care units is settled, the best that can be done is to suggest second-best solutions. The health planning agencies seem, to judge from their publications, to believe that there are serious shortages of unit staff. This study found no evidence of trained nursing shortages, but it did find many administrative weaknesses. The official and voluntary health agencies might seek to help individual hospitals achieve better administration so that units could perform as effectively and economically as possible. It is clear from recent history that if decisions about provision of coronary-care units are left to individual hospitals, excess capacity and inefficiency will result. These decisions must be made by bodies that are more disinterested and have a broader view than that of a single institution. The certificate-of-need legislation, which is being adopted by many states, should help to enforce these disinterested decisions. Certification of need does not guarantee effective service performance as was illustrated by the weaknesses of some teaching-hospital coronary-care units. Services such as radiation therapy, cardiac surgery and coronary-care units that are likely to be limited by certification should also be accountable for data on patient selection, end results and costs so that actual performance can be judged. It obviously would not be right to limit services without evidence that the better patient care, which it is assumed certification will assure, is actually obtained.

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Table 6. Occupancy Rate, Discharges per Nurse and Discharges per Bed, by Hospital Group, October 1, 1969, to September 30, 1970.

HOSPITAL GROUP	NO. OF HOSPITALS	% OCCUPANCY*	DISCHARGES/NURSE†	DISCHARGES/BED‡
University related	7	78.8 (71.1-96.4) [§]	34.3 (21.2-42.8)	64.3 (52.3-79.8)
Other teaching	5	76.9 (66.2-87.1)	29.8 (20.5-46.6)	62.3 (49.7-95.5)
Nonteaching	20	70.6 (27.6-92.6)	27.3 (10.0-46.8)	48.5 (16.0-95.5)
All hospitals	32	74.3	29.8	56.0

*Chi-square = 5.85 (p = 0.055).

†Chi-square = 8.64 (p = 0.015).

‡Chi-square = 4.42 (p not significant).

§Figures in parentheses are ranges.

parent. Nurses in many of the units with part-time directors offered opinions that were critical of its administration (inappropriate patient admissions, nurses' authority that was not commensurate with their responsibility, and credit taken by physicians for successful outcomes, with the nurse given the responsibility for the failures). It appears that there were three types of units: those with full-time directors with strong direction; those with part-time directors with strong direction; and, finally, those with part-time directors with ineffective direction. Since we do not have systematic information on the distinction between the last two classes, we have compared the units with a full-time director, where these complaints were not heard, and all others using the various measures previously presented (Table 7). The units with full-time directors are clearly different by every measure — by disease, by efficiency and by cost.

DISCUSSION

This study has demonstrated important differences in the mean performance of coronary-care units in university, other teaching and nonteaching hospitals. These groupings also tend to reflect hospital and unit size, which was also related to the efficiency of the operation. The differences are shown by both medical and

economic measures, including patient selection, case fatality rates, occupancy rates, personnel productivity and treatment cost by spell of treatment. In general, the units in university hospitals demonstrated the best performance by both medical and economic measures with the other teaching hospital group in a middle position and the nonteaching hospital group having the poorest record. Although the group means for most measures showed striking and important differences, these were seldom statistically significant. For example, the discharges per trained nurse were impressively greater in the university than in the nonteaching hospitals, but these differences were not significant because of great variation within each hospital group. The only measures that were significant were patient selection, occupancy rate and discharges per bed. The lack of statistical significance between these striking group differences is disappointing; it is the great within-group differences that make them not significant.

It was often possible from personal observation to explain such great variability. One university hospital, for example, treated a very low percentage of patients with myocardial infarction (37 per cent) because it was sharing patients with a small, nonteaching hospital a few minutes away. The area had insufficient patients to support two units. The reason for some variability was clear from the data. Only 50.4 per cent of all patients treated in coronary-care units had myocardial infarctions. Simply stated, too many facilities have been provided. The data also demonstrated important differences that were related to unit size. Among the 28 Tri-State and Vermont hospitals, there were only four units of more than four beds, the size at which economies of scale became apparent.

Perhaps one of the most useful aspects of this study lies in its illustration of the effect of developments on the cost of medical services. It also illustrates the weakness of our policy in dealing with new medical developments.

Feldstein has pointed out that between 1950 and 1968, the consumer price index rose by 45 per cent while hospital costs rose 292 per cent. He concluded, "Increasing demand has been identified as the primary reason for the unusually rapid rate of cost increase . . . Higher demand has induced a change in the technology of hospital care to a better but more expensive product."⁹ The provision of coronary-care units has undoubtedly contributed to this more expensive product. The evidence for a better product will be examined below.

Economy of services was not a major consideration in the provision of intensive care for patients with myocardial infarction. These units have been built in large hospitals where medical and administrative staffing was ample and also in small hospitals where critical staff, such as cardiologists, might be lacking. Few units have taken the necessary steps to assure competent selection of patients or efficient management of the unit. Published guidelines,^{10,11} which could help assure competent management or economical operations,

Table 7. Patient and Economic Measures According to Type of Director.

MEASURE	FULL-TIME DIRECTOR	PART-TIME DIRECTOR
No. of hospitals	6	26
Total patients	2,305	5,710
Mean no. of beds	6 (4-8)*	4 (2-13)
% with myocardial infarction	57.0 (36.7-85.0)	47.5 [†] (28.1-65.6)
Death rate from myocardial infarction	16.0 (10.0-29.0)	19.2* (5.9-48.0)
Average length of stay	4.6 (3.9-5.0)	4.8 (2.9-8.8)
Discharges/bed	62.3 (52.3-71.2)	54.4 (16.0-95.5)
Occupancy rate	79.0 (71.1-96.4)	70.6 (27.6-94.4)
Discharge/nurse/yr	32.6 (21.2-42.8)	28.7 (10.0-46.6)
Cost/patient	468.00* (349-817)	481.00* (289-1,138)

*Figures in parentheses are ranges.

[†]2 hospitals in which all patient records were incomplete or not available are not included in this calculation.

*New York City hospitals deleted from cost calculations.

Table 4. Total and Average Expenditures.

HOSPITAL GROUP	NO. OF HOSPITALS	TOTAL EXPENDITURES	COST/PATIENT	COST/PATIENT DAY
University related	7	1,346,019 (\$872,673)*	551.20 (\$438.53)	126.52 (\$104.15)
Other teaching	5	1,360,319 (683,341)	624.00 (445.46)	138.54 (102.31)
Nonteaching	20	1,785,214 (1,506,876)	526.15 (500.79)	102.68 (107.58)
All hospitals	32	4,491,552 (\$3,062,890)	560.39 (\$468.83)	118.69 (\$105.38)

*Figures in parentheses show the costs when the New York City hospitals are deleted.

ously ill group was \$160 in the university-related, \$171 in the other teaching, and \$232 in the nonteaching hospitals. These costs were 67 per cent, 72 per cent and 190 per cent above the average daily inpatient costs in the three hospital groups.

The distribution of costs according to expenditure category within coronary-care units (Table 5) was remarkably similar from hospital to hospital and by groups. There were only a very few exceptions, mainly in small hospitals, which did not affect the group means. Personnel accounted for about ⅓ of total costs — a finding similar to that observed in general-hospital experience. Physician costs represented a lower percentage of the total in the teaching hospitals, where the staff was usually salaried, as compared with the units of nonteaching hospitals, whose physicians were always paid on a fee-for-service basis. Nonteaching hospitals tended to employ fewer ancillary personnel (technicians, housekeepers and orderlies). Supplies and fixed costs (overhead and depreciation) represented very similar proportions of total expenditures in all hospitals and hospital groups.

Of the 32 coronary-care units in the study, 12, or 38 per cent, made a profit. In nine, it was substantial, amounting to more than 10 per cent of income. With one exception these profitable units had four to 13 beds. Nine of the 12 profitable units were in hospitals having more than 200 beds. In three hospitals, income covered only ½ to ⅔ of cost. Nine hospitals generated income sufficient to cover between ⅔ and 90 per cent of the unit costs, whereas in the remaining eight hospitals, income covered between 90 and 100 per cent of expenses.

When some measures of efficiency were used to test the productivity of the units, the teaching hospitals were found to be more efficient in the use of both labor and nonlabor resources. In Table 6, the occupancy

rate, discharges per nurse and discharges per bed were used as measures of efficiency. The occupancy rate is used here as a measure of nonlabor resources. The units in teaching hospitals were larger, more often part of a large hospital, and usually located in metropolitan areas, and were able to make more effective use of their physical facilities, as evidenced by the increasing economic returns to scale (p equal to 0.055). The coronary-care units are like hospitals in this respect: the larger hospitals characteristically have higher occupancy rates than the smaller ones.

Similar efficiencies were found in the use of labor resources as defined by the number of discharges per trained nurse per year. The increased productivity is most evident in the university hospitals. Again, these were the largest hospitals with the largest units. The nursing staffs in the university-related hospitals were on the average 15 per cent more productive than those in the other teaching hospitals and 26 per cent more productive than those in the nonteaching hospitals by this measure.

Discharges per bed were used as a combined measure of labor and nonlabor efficiency — a statistic widely used in Great Britain and occasionally in this country. The teaching hospitals had 30 per cent greater productivity than the nonteaching hospitals by this measure (p less than 0.02).

Increasing economies of scale became evident as unit size increased (beyond four beds), and continued through the largest unit in the sample (13 beds). Even though the large units had more, and more varied, staff, including a full-time director, interns and residents, output rose faster than cost. As the units became larger, they seemed to be able to use their physician resources, manpower and physical facilities more effectively. More intensive practice evidently improved productivity. There was no important relation between per diem charges and hospital profits. However, there was some relation between profit and labor and nonlabor productivity, although not so great as to be important.

The total investment in facilities and equipment and the cost of operation of all coronary-care units in Vermont, New Hampshire, Massachusetts and Rhode Island has been estimated for 1970 from the study sample. The cost of building and equipping units was small in relation to the annual cost of operation (\$3.7 million vs. \$6.4 million).

During the course of the study, the substantial differences in the administration of the units became ap-

Table 5. Total and Percentage Expenditures, According to Category.

HOSPITAL GROUP	NO. OF HOSPITALS	TOTAL EXPENDITURES		NURSE COST	PHYSICIAN COST	OTHER PERSONNEL COST	SUPPLIES COST	FIXED COST
		cost	%					
University related	7	1,346,019	100.0	51.1	11.7	15.9	4.6	16.7
Other teaching	5	1,360,319	100.0	54.3	10.6	14.1	3.9	17.1
Nonteaching	20	1,785,214	100.0	52.0	14.5	11.7	3.4	18.4
All hospitals	32	4,491,552	100.0	52.4	12.5	13.7	3.9	17.5

Table 2. Length of Stay.

HOSPITAL GROUP	NO. OF HOSPITALS	MEAN NO. OF BEDS	NO. OF PATIENTS		NO. OF PATIENT DAYS		AVERAGE LENGTH OF STAY <i>days</i>
			TOTAL	MEAN/HOSPITAL	TOTAL	MEAN/HOSPITAL	
University related	7	5 (3-8)*	2,442	349 (157-509)	10,639	1,520 (779-2,260)	4.4 (3.5-5.0)
Other teaching	5	7 (4-13)	2,180	436 (207-646)	9,819	1,963 (1,106-3,140)	4.5 (3.3-4.9)
Non-teaching	20	3 (2-10)	3,393	170 (32-566)	17,386	869 (151-3,379)	5.1 (2.9-8.8)
All hospitals	32		8,015		37,844	1,183	4.7

*Figures in parentheses are ranges.

admitted to the units were similar in all hospital groups (Table 3), but the ranges were very great. The death rates for patients with myocardial infarction in non-teaching hospitals (5.9 to 48.0 per cent) ranged the widest. The mean case fatality rate for myocardial infarction in the units of all study hospitals was 18 per cent, which was higher than most published rates. One-half the units had case fatality rates for myocardial infarction greater than 20 per cent, and 16 per cent had case fatality rates above 35 per cent. Unfortunately, no information on severity of illness was collected, so that no explanation for the reasons about these extraordinary differences can be offered. In all hospitals the death rates of patients with diseases other than myocardial infarction were extremely low — about 1 per cent. These rates were lower than the general-hospital inpatient mortality rate of 3 to 4 per cent.⁷

Financial Data

When total costs were viewed in relation to the number of patients discharged, the pattern was unclear because of the three New York City hospitals that were added to permit examination of very large units. The daily costs in these three hospitals were far higher than those of any of the New England hospital coronary-care units and thus skewed the averages upward two

Table 3. Deaths from Myocardial Infarction and Other Causes.

HOSPITAL GROUP	NO. OF HOSPITALS	ALL PATIENTS		PATIENTS WITH MYOCARDIAL INFARCTION		ALL OTHER PATIENTS	
		TOTAL	DEATHS (%)	TOTAL	DEATHS (%)	TOTAL	DEATHS (%)
University related*	6	2,124	9.3	1,166	16.3 (14.3-29.0)*	1,208	0.6 (0.6-0.8)
Other teaching*	4	1,973	10.2	1,019	19.2 (10.0-24.2)	954	0.6 (0.5-0.7)
Non-teaching	20	3,393	9.5	1,588	18.7 (5.9-48.0)	1,805	1.4 (1.0-1.8)
All hospitals	30	7,490	9.6	3,775	18.1	3,965	1.0

*1 hospital in each group deleted since no. of myocardial infarctions & deaths from myocardial infarctions unknown or not recorded.

*Figures in parentheses are ranges.

times or more, mainly owing to higher salary levels. Their deletion from all financial calculations reveals a definite pattern among the New England hospitals (Table 4). The New York City hospitals have been included in other tabulations because their other characteristics were similar to those of all the other study hospitals. When the atypical New York City hospitals are deleted from the cost calculations, the variability is 2½ times in the cost per patient spell and 1½ times in daily cost.

The range of daily costs was great — from \$65 to \$215, with a mean for all hospitals of \$119 per day. The difference between the least and most expensive non-teaching hospitals was 250 per cent whereas in the other teaching group, it was 48 per cent, and in the university-related group, 134 per cent. These differences were due mainly to different staffing levels. There was no relation between costs and case fatality rates. The mean daily patient charges were about \$100 for all coronary-care units, with a range of \$64 to \$250.

In the teaching hospitals costs per patient spell in the unit (daily cost times length of stay) was less than in the nonteaching hospitals. Teaching hospitals had larger and more elaborate staffing patterns and provided more intensive care at a higher daily cost. However, because they discharged patients sooner, there was a net saving to the patient or third-party payer.

The average daily cost for all patient care has been calculated for the study hospitals by means of total annual costs, bed days available and occupancy rates.⁸ The average daily cost for all inpatient care in the university-related hospitals was 7 per cent less than that for care in the unit.* In the other teaching hospitals this cost difference was 1 per cent whereas in the non-teaching hospitals it was 25 per cent less than in the coronary-care unit. It appears that the average care given in teaching hospitals is almost as intensive as in the intensive coronary-care units when judged by its cost. Only in the nonteaching hospitals is care in the unit clearly and substantially more expensive.

The patient population to be used for cost calculations presents problems since three distinct groups are involved — patients with myocardial infarction, a second group of "suspected" infarctions, and a third of low-risk patients with other cardiac or noncardiac diseases. Because the staffing needs of units are rigid and the costs are fixed whatever the census or the patient mix in the unit, we have allocated the total cost of the units to the patients with myocardial infarction and other seriously ill patients, who presumably receive most of the care.† When the cost per patient in this group was calculated it was much higher than that calculated for all patients. The daily cost for this seri-

$$\text{*Mean daily cost} = \frac{\text{Total annual inpatient cost}}{\text{Number of beds} \times 365 \times \% \text{ occupancy}}$$

† The other seriously ill group includes patients with coronary insufficiency or angina pectoris (the usual "suspected myocardial infarction" or false-positive infarction), patients with higher degrees of heart block or serious arrhythmias.

Nineteen of the hospitals combined their coronary-care units with medical or surgical intensive-care units. In each of these hospitals it was possible to separate coronary care from other intensive care for this analysis. This involved determination of the patient days of care given annually in each part of the unit and the allocation of costs on a pro rata basis. Since no important differences were found between the separate or combined coronary and intensive-care units they are analyzed together.

Five of the university-related hospitals and one other teaching hospital had full-time directors, staff physicians and interns and residents. The remaining teaching hospitals (two university and four other) did not have full-time directors or staff physicians but did have residents and interns rotating through the unit on a regular basis. All the nonteaching hospitals had part-time directors.

The study population included all patients admitted to the New England hospital coronary-care units between October 1, 1969, and September 30, 1970. In the New York City units, data were collected for the calendar year 1970.

The data recorded for each patient included diagnosis at discharge from the unit, length of stay in the unit, and death or survival in the unit. These data were recorded from either the departmental log or the individual patient records. Diagnostic and mortality information on many patients could not be obtained in two hospitals, and they were omitted from certain tables, as noted. No clinical patient data were collected, so that there is no information on severity of disease or accuracy of diagnosis.

The information on hospital income and expenditure pertaining solely to the coronary-care unit was obtained from hospital fiscal records. Physician costs were determined from hospital records or Blue Cross fee schedules. The methods of data collection and definitions used have been described in an earlier publication.⁶ Unpublished details are available.

All the data collected were separated into two distinct categories — patient and financial. The patient data deal with the patients, discharge diagnosis, outcome and length of stay. Financial data concern hospital income and expenditure in providing care in the unit only, and the efficiency with which care was delivered. Nonhospital-related patient costs, such as wages lost during the hospital stay, are excluded.

Although data on personnel, finances and patients were abstracted from hospital records, no systematic collection was made of information on the units' administration and organization. In the course of the study, conversations with personnel in the various units uncovered marked differences between units that apparently led to important differences in organizational and administrative effectiveness and policy implementation. Comments in this area are noted as our own opinions.

Conventional tests of significance were used for discharge diagnosis and case fatality data (Tables 1 and

3). For the other statistical manipulations described in Tables 2 and 4 through 7, the Kruskal-Wallis one-way analysis of variance by ranks of the observed values was used.

RESULTS

Patient Data

In Table 1, the distribution of diseases by the principal diagnosis on discharge from the units in the 32 study hospitals is presented. Myocardial infarction was by far the most frequent diagnosis (50.4 per cent of all patients in all units). The differences in the number of infarctions treated in the three hospital groups were statistically significant (p less than 0.0005). The per cent of patients with infarctions varied by hospital group, and the range was substantial: 37 to 85 per cent in university related, 39 to 66 per cent in other teaching and 28 to 66 per cent in nonteaching hospitals.

The university group included one eight-bed unit in which only 37 per cent of patients treated had myocardial infarction. If this atypical hospital is deleted, the proportion of infarctions treated in this group was 61 per cent, with a range of 44 to 85 per cent. With one exception, the teaching hospitals had fewer patients with diseases other than myocardial infarction. Patients with higher degrees of heart block were proportionately twice as frequent in teaching as in nonteaching hospitals. If patients with manifestations of coronary heart disease other than myocardial infarction (higher degrees of heart block, cardiac arrest occurring elsewhere in the hospital, serious arrhythmias, coronary insufficiency or angina pectoris) are added to the patients with proved or probable infarction, the proportion of patients with serious episodes was 55 per cent in the nonteaching, 60 per cent in the other teaching and 65 per cent in the university-related groups. The others were a low-risk group.

The length of stay in the coronary-care units was shorter in the teaching hospitals and was shortest in the university-related ones (Table 2). There was also great variability between hospitals within each group, with the widest range in the nonteaching hospitals.

Overall, the mean case fatality rates for all patients

Table 1. Discharge Diagnoses.

DIAGNOSIS	UNIVERSITY RELATED*		OTHER TEACHING*		NON-TEACHING	
	no.	%	no.	%	no.	%
Myocardial infarction†	1,166	54.9	1,019	51.6	1,588	46.8
Arrhythmia	308	14.5	378	19.2	520	15.3
Congestive heart failure	152	7.2	111	5.6	268	7.9
Coronary insufficiency	48	2.3	109	5.5	214	6.3
Angina pectoris	70	3.3	34	1.7	160	4.7
Heart block	52	2.4	66	3.4	46	1.4
Other cardiovascular	215	10.1	87	4.4	402	11.9
All noncardiovascular	70	3.3	36	1.8	146	4.3
Diagnosis unknown	43	2.0	133	6.8	49	1.4
All hospitals	2,124	100.0	1,973	100.0	3,393	100.0

*Records of patients with diagnoses of myocardial infarction & other heart diseases were incomplete or not available in 1 university & 1 other teaching hospital; data from these 2 hospitals are omitted from this distribution.

†Chi-square = 31.54 ($p < 0.0005$).

Table 2. Attack Rates According to Grade.*

GRADE	NO. OF CASES	ENROLLMENT	ATTACK RATE [†]
7	57	1,120	5.1
8	162	1,115	14.5
9	160	1,186	13.5
10	180	1,141	15.7
11	152	1,015	14.9
12	155	918	16.9

*All schools combined.

[†]Cases/100 students.

February from 964 of the 1556 students (62 per cent). The results are given in Table 3. Of 726 previously unvaccinated children in these three grades 191 (26.3 per cent) had rubella antibody titers less than 8. Two hundred and thirty-three (97.9 per cent) of 238 seventh graders who had received vaccine were seropositive.

On May 24, a second serum was obtained from 83 students who were initially seronegative. In 14 (17 per cent) seroconversion had occurred, and 10 of these 14 (71 per cent) gave a history of symptoms of rubella since giving the first specimen. The ratio of apparent to inapparent infections in this small sample is 2.5:1.

DISCUSSION

Rubella control in the United States is based primarily on the concept of "herd immunity."⁵ Such immunity is said to exist when the proportion of immune members of a population is large enough to reduce greatly the probability of infection of susceptible members of that population.⁶ A unique modification of the classic concept of herd immunity is applied in rubella control because of the inherent risks in vaccinating postpubertal females on a large-scale basis. It is anticipated that immunizing one "herd" i.e., prepubertal children — will greatly reduce the spread of rubella virus in the community and will protect a second "herd" — susceptible pregnant women. In Casper, 70 per cent of prepubertal children had been vaccinated, and an estimated 70 to 75 per cent of those not vaccinated were naturally immune. However, despite this immunity, a large rubella epidemic occurred, and at least seven pregnant women were infected. It is apparent that in this community, the presence of an immune, prepubertal "herd" was not effective in preventing community spread of rubella.

There are a number of possible explanations for the occurrence of this epidemic in the presence of substantial immunity in younger children. The number of immunized prepubertal children may not have been high enough to provide a herd immunity effect. Also, the percentage of adolescent children in Casper who were naturally immune to rubella before the epidemic may have been unusually low. Moreover, the rubella vaccine may have been ineffective in preventing the disease. Or, finally, the concept of immunizing one segment of a population to prevent illness in another segment may not be valid for rubella. These four considerations are discussed below.

First of all, the relatively high immunity level in children one to 12 years old appeared to be effective in preventing spread of clinical rubella within that particular segment of the population. Over 70 per cent

Table 3. Serologic Survey, Junior High School, February, 1971.

GRADE	RUBELLA VACCINATION	NO. OF SPECIMENS	SUSCEPTIBLE STUDENTS*	
			number	%
7	Vaccinated	238	5	2.1
7	Unvaccinated	93	37	39.7
8	Unvaccinated	335	101	30.1
9	Unvaccinated	298	53	17.7
	Total unvaccinated	726	191	26.3

*Rubella hemagglutination-inhibition titer of <8.

of these children were immune, but only 1 per cent contracted clinical rubella. However, this herd immunity in itself had little effect on the perpetuation of the epidemic. It is unlikely that a higher percentage of immunity in this age group would have substantially influenced the course of the epidemic.

Secondly, in comparison to measles and mumps, to which 85 to 90 per cent of Americans are naturally immune by the time they reach adolescence,^{7,8} rubella immunity is generally lower at this age. Serologic surveys done since the 1964 rubella epidemic have shown that approximately $\frac{3}{4}$ of teen-agers have serologic evidence of previous rubella infection. In Tampa, Florida,⁹ 77 per cent of children 15 to 19 years old were found to be seroimmune; similarly, 76.6 per cent of over 1000 students 13 to 18 years of age in Atlanta, Georgia, had rubella antibodies.¹⁰ In Casper, a similar immunity level was shown to exist in adolescents. In the serologic survey early in the outbreak, 74 per cent of unvaccinated junior-high-school students were found to be seroimmune to rubella. If it is assumed that this percentage was representative of the immunity of all teen-agers in Casper, adolescents living in this community were not any more susceptible to rubella than other U.S. adolescent populations previously studied.

Thirdly, the rubella vaccine used in Casper was shown to be effective in eliciting an immune response, and vaccine failure was not an important factor in the genesis of the outbreak. Ninety-eight per cent of 238 recipients of vaccine had rubella antibodies, and only 1.5 per cent of all those vaccinated were known to have had rubella during the outbreak.

The main reason for the occurrence of this epidemic appears to be the fourth consideration — i.e., the failure of the herd-immunity concept as it is applied to rubella control. This investigation demonstrates that immunity to rubella in one segment of the population may have no influence on the occurrence of this disease in a second segment of that population. This concept has been stated by Fox et al.⁶ in a mathematical analysis of herd immunity. They showed that the important determinants of an epidemic were the number of susceptible members of a population in addition to the number of opportunities for their exposure to the disease, and that if these two variables remained constant, the total number of immune persons in the population had no influence on the epidemic. This was the case in Casper, where rubella spread with ease among susceptible adolescents, in spite of the previous addition to the community of children vaccinated.

Although the vaccination of prepubertal children in Casper did not prevent an epidemic, this effort undoubtedly did prevent infection of a number of pregnant women after the epidemic began. If younger children had not been immunized, the outbreak would have been more extensive, and the number of exposed, susceptible women would have been much higher. Thus, childhood rubella immunization remains an important method of rubella prevention; however, because of the potential for outbreaks in older children this procedure should be supplemented by other methods of rubella control. The most important of these is the identification and vaccination of susceptible, nonpregnant women in the child-bearing age.

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R M P

SPECIAL ARTICLE

END RESULTS, COST AND PRODUCTIVITY OF CORONARY-CARE UNITS

BERNARD S. BLOOM, M.A., AND OSLER L. PETERSON, M.D., M.P.H.

Abstract The use of coronary-care units for the treatment of patients with myocardial infarction has increased explosively with little attention to efficacy, need, or cost.

A study of 32 hospital units revealed that half the patients treated did not have myocardial infarctions and were a very low-risk group. Larger units in teaching hospitals with full-time directors showed lower mean case fatality rates from myocardial infarction, higher percentages of patients with infarction and greater pro-

ductivity and efficiency. These important differences were often not statistically significant because of the great variation within hospital groups.

Intensive care for patients after myocardial infarction should be planned by region, not by individual hospitals, to assure effectiveness and economy. Intensive care of such patients presents an ideal model for regional planning. Finally, proof of effectiveness of intensive care in these cases is lacking.

DURING the past decade the use of specialized coronary-care units for the treatment of acute myocardial infarctions has expanded rapidly. Current practice reflects a belief that treatment in these units reduces mortality through monitoring and prevention or prompt treatment of arrhythmias. Clinicians justify this intensive and expensive therapy by a definitely reduced in-hospital case fatality rate. Research on the units has centered mainly on end results of clinical experience "before and after" institution of a unit within a hospital¹⁻³ or on preventive and therapeutic advances.⁴ This paper will present the findings of a comparative output and cost analysis of diverse types of units providing this care.

OBJECTIVE

The purpose of this investigation was: (1) to determine the true hospital cost and economic efficiency of

different types of units; (2) to ascertain mortality in the units; and (3) to describe the diseases for which patients were treated.

STUDY DESIGN

A sample was randomly selected from all hospitals in New Hampshire, Massachusetts and Rhode Island that reported that they had units for intensive coronary care.⁵ The universe was stratified according to number of beds for coronary care (three beds or less, four or five beds, and six beds or more) and teaching function (university related, other teaching and non-teaching). One third of the hospitals in each cell were randomly selected with a minimum of two hospitals examined per cell. In one cell, the "other teaching" with three beds or less, there were no hospitals. In addition, all Vermont hospitals having a coronary-care unit were studied. Since there were very few large units (eight beds or more in large hospitals) in these four New England States, four more were added, three randomly selected from New York City hospitals and one in Connecticut. Thus, a total of 32 units were included in the survey.

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Regional Medical Program



Like many U. S. docs, I regularly read and usually enjoy Irving Page's editorials in *Modern Medicine*. However, I must admit I didn't enjoy the recent one he wrote about RMP. Usually a seasoned observer of the medical scene, Dr. Page, in this case, fired off in many directions - including a blast at RMP.

Actually, I am most distressed at his lack of understanding of the RMP program. If he doesn't understand what we are about, then many others must be even more confused. If RMP's goals are not well understood, the confusion may result from one of the following four reasons:

(1) The original legislation did not provide a specific blueprint, rather, it was *deliberately* permissive.

(2) Local autonomy has led to somewhat different goals in each of the 56 RMP Regions.

(3) As the RMP legislation has been extended, its goals have been modified.

(4) RMP is most successful when it maintains a low profile, serving as a catalyst helping to coordinate health efforts of others.

Consortium

After six years of existence, I think the RMP may be described as a consortium of providers responsive to health needs and problems. It provides a framework within which health providers can come together to meet health needs that cannot be met by individual practitioners, hospitals or organizations acting alone. It gives health providers an opportunity to address health problems and provides them with the financial means for doing so.

Originally directed at heart disease, cancer, stroke and related diseases, RMP now shares with other health groups the broad goals of:

(1) Increasing the availability of care, (2) Enhancing its quality, (3) Moderating its costs.

Moreover, continuing education has been and continues to be a major RMP thrust.

A few examples of W/ARMP activities follow:

(1) A preceptorship project has enabled practicing physicians from all parts of Washington and Alaska to have an

individualized learning experience of a week or longer with a physician of their choice in a hospital of their choice. A total of 432 physicians and allied health personnel have completed such preceptorships at 16 hospitals in 22 fields.

(2) Under RMP auspices, Seattle, King County, Washington and Alaska physicians have visited throughout Alaska and Washington on teaching and consultation missions. These visits have served to initiate linkages between peripheral communities and the Seattle-King County medical complex and were of considerable value in establishing the WAMI plan for regionalizing medical education.

(3) Continuing medical education was advanced by the appointment three years ago of 25 continuing education coordinators. Under the joint sponsorship of the medical school, WSMA and RMP, these physicians serve as coordinators of educational efforts in the 19 areas in which they practice. Originally concerned more with audio-visual teaching aids, they have now turned their attention to medical audit or patient care appraisal and in ten hospitals have initiated such programs.

(4) Residents in internal medicine from the University program were introduced to community practice for the first time when the University was encouraged by RMP to place them in local community hospitals. In addition to upgrading care in these communities, the Guest Residency program has already led to the decision by some medical residents to return to these areas to practice. Swedish Hospital in Seattle, which hosted the first medical resident, was sufficiently impressed with the results that it now funds two full-time residents through the University, and Sacred Heart Hospital in Spokane funds one resident.

(5) By coordinating relations between the hospital in Willapa Harbor and Virginia Mason Medical Center, RMP has helped to strengthen the services of a small hospital and helped to relieve the physician shortage in that community. A pharmacist reorganized their pharmacy, cutting their inventory in half by eliminating duplications and discarding out-of-use drugs. In-service training programs of nurses, administrators and technicians have been started; specialists from the Mason staff have held teaching seminars for the family practitioners in the area.





Vashon and Darrington

The Community Health Services Program, one of RMP's six broad groupings of activities, involves the University at the grass root level in trying out innovative ways to deliver health services and in utilizing new types of personnel.

On Vashon and Maury Islands, where only one physician practices, CHS asked the University of Washington Division of Community Development to help the 6,000 residents conduct their own health survey. The residents documented the need for emergency and weekend services and found that the majority of people would welcome such services by new types of personnel, such as the physician's assistant and nurse practitioner.

Something similar has been happening in Darrington. Unable to attract a physician, the residents decided to form their own medical clinic and to staff it with two nurse practitioners to provide primary care. With RMP assistance, the residents elected a local Board of Trustees, negotiated agreements for supervision and back-up by physicians in a neighboring area and obtained approval by the Snohomish County Medical Society. Preceptorships for the RN's to prepare them for their new role are being arranged through the University Division of Family Medicine and the School of Nursing.

Winds of change

Today few doubt that innovative approaches to the study and delivery of health care are necessary. Both the RMP and the University are facing into the winds of change. Together they stand ready to work with the private sector of medicine to assist as appropriate in influencing the direction and the effectiveness of that change.

Honest broker

I think there is a need on the American health care scene for the RMP to serve as a coordinator or "honest broker", bringing together the various health providers for local planning and action, and serving as an effective link between the federal, state and local governments and the private sector. By these means, RMP can help bring about those changes in health care that physicians and other health providers think are necessary. In Washington and Alaska, your RMP tries to

serve as an effective channel through which any physician in this region can express his convictions. We invite your comment and suggestions.

UW - RMP Relation

In October, 1968, the University of Washington took a significant step toward broader participation in the region's health care system by signing a memorandum of understanding with the Washington/Alaska RMP.

With the signing of the memorandum, the University agreed to administer funds for activities aimed at solving local health care problems originated by health leaders and practicing physicians as well as ordinary citizens. Vital to the success of this new arrangement was the University's early decision to participate in, but refrain from directing, the Program.

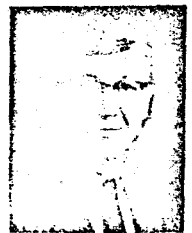
Both the RMP and the University benefit by this unusual arrangement. RMP, working directly with practitioners and providers of health care, benefits by having access to the University's faculty - its storehouse of knowledge, experience and resources; the University benefits by the building of the two-way communication system, bridging the gap between theory and practice. Working together, the two organizations are able to explore and test new ways of improving both the quality and the delivery of health care throughout the region.

Goals, policies and priorities for the RMP are set by its 40-member voluntary Regional Advisory Committee, which also reviews all proposals submitted. The bylaws specify "that no particular group, profession, organization, institution or geographic area shall hold a majority of seats" on RAC.

While the RAC is the policy and program-making body, the University administers all funds and is responsible for financial and grant administration and personnel practices.

BY

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Health Care Financing and Delivery in the Decade Ahead

Walter J. McNerney

One hundred eighty-six years ago, Robert Burns pleaded that we might be given the power to see ourselves as others see us. If that plea proves anything, it is that 18th century Scotland was not blessed with the newspapers and television news broadcasts that we in the United States enjoy today. Through them, we have indeed been given the power to see ourselves through the eyes of others. All we have to do is read or listen.

For example:

Rochester, NY, November 1971.—Surveys in the area were reported to show that because of a lack of area-wide planning, 30% of all hospital and nursing home patients should have been cared for elsewhere.

For editorial comment see page 1179.

Chicago, February 1972.—Dr. Huntley, of the Department of Health, Education and Welfare, said 60,000 lives could be saved annually if present knowledge about emergency care were put into effect. He added that only eight to ten communities have proper emergency services.

Toledo, Ohio, June 1971.—The president of the local Academy of Medicine said doctors and hospitals alike

are responsible for high hospital costs by keeping patients too long and by not using facilities and services in an economical way.

Washington, DC, February 1972.—The Kennedy health subcommittee has subpoenaed records of the Joint Committee on Accreditation of Hospitals and will subpoena records of the California Medical Association to evaluate the quality of hospital care.

Boston, March 1972.—Wilbur Mills said the time is ripe for national health insurance, without confining ourselves to any one system.

Washington, DC, December 1971.—A reporter berated the American Medical Association for deploring the rise in malpractice suits rather than acting to reduce their causes, such as eliminating needless surgery.

San Jose, Calif, February 1972.—Representative Roy's assistant, Dr. Biles, said there are too many specialists and not enough general practice physicians.

I call your special attention to the following two items:

Chicago, May 1972.—The *American Medical News* reported that the President's manpower report said there will be enough MDs by 1980 to overcome shortages.

In January 1972 the *American Medical News* reported that Geoffrey Moore, US Commissioner for Labor Statistics, said the total number of MDs trained in this decade will fall short of the need.

Chicago, May 1972.—Discussing MD distribution, Chicago papers pointed

out that the three states with the highest ratio of MDs to patients—states with the most attractive living conditions—receive half of all Medicaid funds and a third of all Medicare funds, even though only one fifth of the persons eligible for both programs live there.

Washington, DC, August 1971.—A report submitted to the Secretary of HEW calls for a two-year moratorium on all licensing laws, more stringent standards for license renewal, and representatives of consumers on licensing boards.

The next two are also interesting when seen side by side:

Chicago, May 1972.—The editor of "Action Kit of Hospital Law" said the time has come to recognize that each person has a constitutional right to receive a certain level of care.

Boston, March 1972.—A *New England Journal of Medicine* article, and letters of response from readers, reflected the belief of MDs that their services should go to the highest bidder and that no one has an automatic right to be treated.

And finally . . . Washington, DC, March 1972.—A bill to establish a new National Institute of Health Care Delivery was introduced.

To these specific items we can add some general assertions that are made time and time again: that hospitals and physicians are not interested in productivity; that health is better in other countries than it is here; that prepayment plans and insurance companies have excessively

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steroids with an increase in the diffusion capacity is previously unreported. Weaver et al⁹ reported the only other unequivocal response to steroids documented by symptoms and x-ray films of the chest but without change in diffusion capacity. Hepper et al⁵ reported a case in which a dramatic response occurred in a 56-year-old woman, with increased lung volumes and return to an asymptomatic condition. However, the diffusion capacity did not change, and radiologic improvement was equivocal. It was our distinct impression that this patient continued to deteriorate while receiving 40 and 60 mg of prednisone daily, and then quickly had a subjective symptomatic response after being placed on a regimen of 100 mg daily. One may argue, however, that improvement started with the lower dosage. This subjective improvement was soon followed by objective improvement as muscle enzyme levels and vital capacity returned toward normal.

The importance of high-dosage therapy with corticosteroids in connective-tissue disease has been emphasized in recent years. Vignos et al¹³ emphasized that a patient with polymyositis should not be considered steroid-resistant until he has failed to respond to 80 to 100 mg of prednisone daily. Of the six patients who received corticosteroids reported in the literature, none received an adequate trial at this dosage. Although it is difficult to evaluate the effectiveness of corticosteroids in this setting, it seems certain that a trial at high-dosage levels is warranted. Recent reports^{14,15} suggest immunosuppressive drugs will be found efficacious in patients with steroid-resistant polymyositis.

The response of polymyositis to corticosteroids and immunosuppressive agents is not surprising in view of recent work studying the etiology of this problem. Polymyositis is now commonly linked with the connective-tissue diseases for several indirect

reasons including a significant prevalence of positive antinuclear-factor and latex-fixation tests, clinical overlap with scleroderma and rheumatoid arthritis, and its presence associated with malignancy in about 15% of cases. Recently autoimmune delayed hypersensitivity has been an implicated mechanism. Based on earlier work in animals done by Dawkins¹⁶ and Takayanagi,¹⁷ Currie et al¹⁸ reported in 1971 that human muscle homogenates will cause blastic transformation in lymphocytes from patients with polymyositis but not in controls. Also, these same lymphocytes destroy human muscle cells in tissue culture. If these considerations of pathogenesis of polymyositis are confirmed, the response of patients to corticosteroids and other immunosuppressive agents would be more easily understood.

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high retentions and exorbitant profits; that prepayment and insurance fail to provide coverage for the poor; and that prepayment and insurance exert no influence over providers in the area of costs, but merely act as conduits of money from subscribers and policyholders to providers.

From those and many other comments and criticisms heard from every side, it is apparent that the health field is restlessly in transition. The future is not in sharp focus. The direction is not carefully laid. New issues—many of them directly contradictory—are raised almost every day. Bad news about the field heavily overshadows the good news.

It is important that all of us recognize those issues and criticisms. But it is even more important to recognize that they are not the basic issues facing voluntary hospitals and prepayment plans.

Furthermore, they do not represent the key to the future. Solving all of the problems raised, and answering all of the criticisms made against us will not guarantee the kind of future all of us want to see.

The things I have been talking about are symptoms. They are not basic illnesses. If we in the health field use up our time responding to each one, then our field will drift more than before; will become more expedient-oriented; will fragment itself further, and eventually find itself at war with its own elements.

The assaults from outside are inevitable, and with them the contradictions. But there is no reason for us to accept all of them as gospel and to permit ourselves to be pushed to and fro with every change of direction of our critics.

Instead, if we truly accept responsibility for the financing and delivery of health care services, if we want to be positive, if we want to give some predictability to the 1970s and the years beyond, then we must meet certain basic conditions:

First, it is essential that we develop and embrace a basic philosophy regarding the delivery and financing of health care.

Second, it is essential that we understand the real issues underlying the events that take place. Without such an understanding, we lack reference points by which to set goals,

judge priorities, and achieve both better access and higher productivity in the field.

Third, it is equally essential that we gain a broad understanding of the public policy framework within which we want to operate, and that we establish clear programs within that framework.

I should now like to cover each of those three considerations.

A Philosophy of Health Care

First, the matter of an overall philosophy. Without fanfare, such a philosophy has been jelling in the midst of the debate over national health insurance. The following points have come to light and have received widespread acceptance inside and outside the health field:

- No individual should be deprived of health care simply because of his inability to pay for it.
- Every person, regardless of his circumstances, should be able to receive high quality care, and receive it with dignity.
- Families should not suffer financial deprivation because of illness.
- Systems must be responsive to changes in medical science and management knowledge, not freeze past or present practices.
- Financing should be linked to delivery to achieve greater effectiveness and efficiency within the system.
- Programs of financing and delivery should be easy to administer.
- Programs must be so designed as to be acceptable to professionals and to the people as well.
- Physicians and other professionals must be motivated by the system to work within the system, and to accept and respect leadership other than their own in many circumstances.
- There must be a reasonable pluralism—a diversity of methods of delivering, receiving, and financing health care.

Before I go on, I would like you to answer, silently, whether you as physicians can accept those points of view.

Even though many of those ideas are general, and all are not unanimously accepted, they represent progress and a significant momentum that should not and cannot be ignored.

Basic Issues Underlying Current Debate

The second essential, after establishing a basic philosophy, is to identify the underlying issues that are not always apparent in public dialogue. I want to mention a few of them.

At the outset, we have to return to a fundamental economic truth: Health is a unique market. If there were any doubt about it, we proved it in 1966. Medicare and Medicaid made it clear that we cannot solve health problems by merely spending more money. Increased demand can and did produce substantial inflation.

It is true that the health field, with its large labor component, is peculiarly vulnerable to the forces of inflation—as are all service industries. But complicating this is the fact that the basic supply and demand forces of the classic market are weak, or apply unevenly. Thus, quality, efficiency, and effectiveness do not materialize in the ordinary course of events between purchasers and providers of service. They must be built in. How that can be done is a major management challenge, and the answer will not be found easily.

A second underlying force is that health is caught up in a raging revolution of rising expectations. Seeing that more can be done, people first expect more. Then they demand more. Consequently, new social policy may help solve the problem as it is today, but at the same time may well change and expand the problem itself.

It has been pointed out that Sweden—with a more moderate range of social problems than the United States—has a tax budget which takes more than 40% of the gross national product. And new items are emerging that will raise the percentage higher. For example, only a small proportion of the population goes on to higher education, and housing is in short supply.

The point is made to indicate that even under higher taxes, social demands would continue to press on public resources—especially in the face of growing pressure for economic as well as political equality. That realization brings us firmly against the fact of limited resources and a need for hard priorities.

A third underlying consideration is the increasingly important—and usually ignored—question: What is the relation, if any, between health services and the health of the population?

That is a tough relationship to unravel. We do know that in countries where infectious diseases no longer predominate as the causes of death (the United States, for example, where they are only one of the top ten causes), it is difficult to demonstrate a strong relationship between longevity and the amount spent on health services. The amount spent can vary as much as 100%, yet longevity can vary only from 5% to 10%.

The question appears to be whether the solution lies in expanding traditional health care (making more of the same available to everyone at lower cost), or in taking a broader ecological view of health.

It is worth noting that in 1951 under the British National Health Service in Scotland, there was a 300% difference in infant mortality ratios between the highest and lowest social classes. In 1969, after the maturing of the national health service and the enactment of substantial social welfare programs, there was still a 266% differential.

The answer seems to be that important factors in health lie outside the traditional boundaries of health care. If we are to avoid spending huge sums of money unproductively, we must attack factors such as income, housing, nutrition, and education along with improving actual health care services. It is only in such an approach to total health that we shall find the answers to health problems.

Unfortunately, this whole issue is surrounded by some very popular myths. For example:

- The greater the technology of care, the better the care provided. Actually, some of the best health care is simply primary care received by a person who stays close to his family.
- Increasing the number of MDs will automatically improve the unit cost and productivity of the field. There is no evidence so far to prove that contention.
- And in some glorious millennium, all health care must be coordinated by a controlling system. Actually, the patient must meet any system half-

way or it cannot help him.

The fourth underlying issue is the relationship of private and public sectors. The two are working together now, but only awkwardly. (The material from this section [relationship of public and private sectors] draws on testimony by me before the Committee on Ways and Means, US House of Representatives, Nov 1, 1971.) Unfortunately, too much of the current debate about national health insurance tends to set the government and private sectors against one another in regard to both delivery and financing of care. Our focus must be on results, on what works. The public has been the object of too many unfulfilled promises already—from both sides. Now we need to let everybody know how things can really be.

We have all heard attempts to discredit private prepayment and insurance in justifying the need for a totally federal financing system. However, our current health problems cannot be that easily simplified. They result from the interplay of strengths and weaknesses throughout the system, involving both sectors. Both have strengths. And both have weaknesses, which have become apparent.

The private sector, for example, has been slow to develop delivery systems such as health maintenance organizations (HMOs) designed to deliver comprehensive care to defined populations, with heavy accent on primary care. Areawide planning has been slow to develop. Carriers have not monitored use of services as energetically as they should have.

But the public sector also must accept its share of the responsibility for the problems as well as of the glories of considerable accomplishments.

The excess number of costly beds in some sections of the country and overpreoccupation with inpatient care relate to the enthusiasm with which public programs met bed shortages by equating better health care with bricks and mortar. Failure to control costs and restructure the delivery of care can be seen in Medicare and Medicaid as clearly as they can in private financing programs.

If the private sector has been fragmented in response to myriad neighborhood and local pressures, the government has been equally frag-

mented in adding one piece of legislation onto another in response to various interests—such as Comprehensive Health Planning, Regional Medical Programs, Hill-Burton, and so forth.

If we are to criticize weak state regulation of health prepayment and insurance, let us recall that the McCarran Act is a federal law.

Little is gained from viewing the problems of health care from the single vantage point of either the public or the private sector. Both are needed. Each has its strengths and weaknesses. It is time we got away from name-calling and down to the business of solving problems by strengthening both sectors and taking full advantage of each one's capabilities.

The health field is deeply imbedded in many subjective, as well as objective, issues, and is enmeshed in a strong tradition of professionalism. It demands an unusual degree of both sophistication and flexible administration. A monolithic posture would strain the political bonds of the system, if not its administrative structure as a whole. In another posture, however, the system could flourish.

It is government that can best set national goals, set important resource priorities, monitor and regulate overall performance, and protect the rights of all citizens through constant pursuit of social justice.

The private sector cannot come close to meeting the health needs of the country without strong government leadership and involvement. And, parenthetically, do you accept that concept? I think acceptance of it is mandatory if the private and public sectors are truly to work together effectively to get done the job that neither can do alone.

Equally important is the acceptance by government of the talents of the private sector, which can best provide managerial ability, diversity, and a capacity to innovate and change. The private sector can meet accountabilities so that excessive conservatism does not result; and it can be a guard against the restricted, or restrictive, budgets of government.

Whatever the nature of the private-public relationship, we should not expect it to be mutually uncritical. Ideally, it should involve honest adversary relations. Progress will

come from a frank admission of differences rather than a pretense that there are none. There should be healthy conflicts of ideas, methods, and perceived needs reflecting different points of view.

The Medicare contract between Blue Cross and the Social Security Administration (SSA) is an outstanding example of the dynamics that can be developed to get a huge job well done. Differing viewpoints clearly stand out during current negotiations on a new Medicare contract:

On its part, the SSA wants extensive prior approval rights on contractor expenses and wants the right to change the contract during its term. In effect, in other words, the SSA wants to manage the contract functions rather than the contract.

On its own part, the Blue Cross Association wants the government to set goals, to establish expected results, and to define standards and guidelines by which the implementation of the contract can be judged. However, our view is that the contractor must manage the job, and have a decent term of contract in which to do its whole job.

The final results—the signed contract—should prove to be an interesting example of just how well private and public sectors can mesh their efforts.

Having listed four underlying issues in the health debate—the uniqueness of health as a market, the revolution of rising public expectations, the relationship between health services and the health of the population, and the relationship between public and private sectors—I have three more to cover only briefly.

The fifth is the issue of consumerism. We see the effect of the consumer movement in newly shaped governing boards of the Blue Cross plans, in hospital boards, in the appointment of ombudsmen, and in the wider establishment of area planning boards. We also see its effect throughout the economy.

Since the early 50s, we have seen life, liberty, and the pursuit of happiness joined by demands for greater equality in other areas by those who have been less than equal:

- Blacks agitating for racial equality.

- Students demonstrating for more power in running their high schools and colleges.

- Teenagers seeking sexual freedom.

- Younger children seeking more equality in the family.

- Women demanding equality with men.

- Patients wanting decision-making powers over their physicians.

- Consumers wanting more power over what products are made and sold.

The movement is affecting every institution—profit and nonprofit, private and governmental. It cannot be ignored. And it is moving more and more into the health field as young citizens cite health care as a right and demand that medicine become a public service. It must be incorporated.

Our response to the consumerism movement is one of the most important issues we face in the months ahead.

Number six of the underlying issues is profit vs nonprofit in the health field. Which way should we go? The health field is filled with 19th century idealists who proclaim that profit has no place in it. At the same time, the more pragmatic see a shortage of capital for building facilities and increasing the numbers of services needed to provide more care to more people than ever before.

Finally, there is the issue of competition—of jockeying for position—among physicians, hospitals, government agencies, and private carriers for definition of their roles and their responsibilities, as well as of their privileges, in the total field.

Some promote HMOs and some protest them. Some favor Professional Standards Review Organization-type plans and others vigorously oppose them. What it all boils down to is that each of us—as an individual or as an institution—is protecting his own turf, and demanding “no trespassing” by the others.

We must face these controversies, and we must negotiate our way out of them if we are to succeed in building and maintaining a strong private sector. If we spend our time shooting at one another in our little battles of selfishness, we leave the field wide open for occupation by others who might prove to be enemies of all of us.

Need for Public Policy Framework

The shadow of national health insurance, which grows longer and touches more of us every day, brings into sharp focus the need for a public policy framework and careful consideration of programs to be carried out within that framework.

National health insurance itself can be divided into two major parts—the framework and the programs. With regard to the framework, three patterns are emerging: (1) Building more incentive into the present system (such as the proposals of the American Medical Association and the commercial insurance industry). (2) Moderated pluralism, with varying approaches to varying needs (the Byrnes proposal). (3) Public utility (exemplified with respect to financing by the Kennedy bill; with respect to delivery by the Ullman bill).

The first seems to be losing favor because it lacks the power to improve access or productivity and because it avoids some of the real issues. I can foresee a day when the AMA will move its position away from its present proposal toward a more far-reaching program.

Regarding the other two, hard decisions must be made.

The public utility approach has its advantages and disadvantages. In its favor is the fact that we see it working well in the telephone, water, and electric fields; that it can provide a high level of access, with minimum standards for participation; and that it can reduce wasteful competition by eliminating overlap. Against it, however, is the fact that it can be a captive of its own constituents and detailed regulations. Those regulations cover such areas as exclusionary licensing, franchising, proper financing, and the complications of regulating the resulting monopolies. Such a system in the health field could bog down.

In its favor, moderated pluralism can have a greater orientation toward goals, make full use of the private sector as well as the public sector, capitalize on what each one does best, and provide options both to the public and to professionals. It tends to focus on results more than on techniques, using the contract as a device for getting the job done. And it more

neatly fits into complex situations and services, offering consumer choice among controlled alternatives rather than a bureaucracy or the wellspring of innovation and adaptation to changing environments. On the minus side, it can involve excessive overlap and fragmentation; and it is less geared to the guarantee of access than the public utility form.

Difficult decisions must be made, and they must be made with one cardinal principle in mind: The choices must be tailored to the field of health care. Concepts and ideas can neither be uncritically adopted nor automatically rejected because they have proved successful or unsuccessful in other areas. The health field is not a port authority; it is not a telecommunications industry; it is not a Tennessee Valley Authority. While franchisement of health facilities may have merit, territorial exclusivity may or may not. More energetic regulation of financing mechanisms—for example, Blue Cross—may strengthen the market without destroying its resolve—with or without line-by-line regulation of providers.

During the months ahead, the issues must be debated among the best minds available—both inside and outside the field of health care. Currently, major forces seem to favor a compromise between the two schools of public utility or pluralistic approaches. What finally happens will depend to a significant extent on your collective—your unified, clearly designed, and clearly stated—resolve.

In any event, HEW must be reorganized to give leadership in the areas of both delivery and finance. Areawide planning must be strengthened. And the market must be freed of constraints placed upon it now by restrictive licensure laws, group practice laws, and the like.

Given a framework within which to operate under national health insurance, effectiveness will be achieved only through carefully conceived programs expertly carried out. Naturally, the programs would change according to the framework.

Important Programs in Any Framework

Keeping in mind that we do not have all of the answers—nor do we know all of the questions, for that

matter—let me give you some views on the kinds of programs that must be carried out. I want to mention only six.

First is reimbursement. There are many different forms now in use, and active experiments are underway to devise newer and better ones. The consensus seems to be that providers must begin sharing financial risk to a larger extent, rather than simply being paid for whatever services they provide, regardless of cost.

We will see more experimentation and more evaluation of systems of reimbursement, with some states going one way on regulation, and other states or the federal government going another. National health insurance will undoubtedly lead to more unity of method, but how much unity is a question that remains to be answered. Clearly, there is a danger in settling on one. The ultimate validation of any method is comparison with another method.

Second is benefits. Here we must put a greater accent on primary care and unrestricted choice to avoid excessive use of expensive acute care facilities and services.

Third is the HMO. There is no stampede toward the group practice, prepaid approach to primary and all other health care, but its use is slowly growing. The Congress is moving toward a practical bill to facilitate its growth. The American Hospital Association and the Blue Cross Association are working together to develop this kind of alternative benefit. Blue Cross now has 13 operational HMOs and will have 30 by the end of the year. By 1980 it is doubtful that more than 20% to 40% of the market will involve HMO services, but it is an essential option to offer the consumer if productivity is to be achieved reasonably close to the point of care rather than at some distant point.

There are many factors to be considered in the formulation of HMO legislation, including these: How comprehensive should benefits be to the subscriber? Should rates be based on community or experience rating? What kind of payments should be made to professionals within HMOs? Should they be profit or nonprofit? What quality of care should be the minimum, and how will it best be evaluated? What breadth of services

will be required within the HMO's subscriber area? It appears now that we will follow the path of reasonable flexibility rather than rigid orthodoxy, desirably if not inevitably.

Fourth is peer review, which is best illustrated, perhaps, by the growth of medical foundations. It certainly is in the interests of medical societies, specialty societies, and the AMA to develop workable standards and boundaries for these programs. The conflicts that now exist regarding relative roles among foundations, hospitals, and carriers must be settled amicably and effectively so that whatever is the best kind of peer review organization approach can be utilized for the benefit of the nation's people. Whereas areawide physician groups can contribute significantly to better quality and utilization, we don't need a duplication of claims administration, electronic data processing capacity, and other well-established mechanisms.

Fifth is areawide planning, which hardly needs any remarks from me. The ultimate approach to this program must make the best possible use of our present capital structure, and at the same time bring some kind of order out of the present chaos by addressing itself to manpower and the market as well as to bricks and mortar.

Sixth and last is the question regarding the efficacy of preventive medicine and health education. Criticizing either of these concepts, no matter how gently, is tantamount to kicking the sacred cow off the sidewalk. But both need to be looked at carefully. Many people apparently are beginning to see that health is related deeply to life-style and the environment. Emphasis in some quarters has happily begun to shift from a focus on more physicians and more hospitals to a focus on a better general life, a realization of rights, and an interest in protecting one's own health.

The track record for both preventive medicine and health education has been poor so far, although undertaken with enthusiasm in selected instances by hospitals, carriers, schools, medical associations, and others.

We shall see renewed interest in programs in this area sparked by rec-

ommendations now being compiled by the President's Committee on Health Education.

There is no single answer, of course, as to whether any given technique can work. The only possibility is to continue to experiment and then evaluate.

Conclusion

Heat will continue on the subjects of health delivery and financing. It will come from consumers, from management, from labor, and—certainly not least—from government. The issues are complex and are not amenable to easy solutions. In trying to develop our own solutions, we must learn to live in a brilliantly illuminated goldfish bowl.

Those of us in the health field must accept the fact that we need a viable NHI bill. Not that we should acquiesce to the proposals of others, but that we should realize that piecemeal approaches will not work. A middle ground between the extreme proposals now before the Congress holds promise as a rallying point for the sound exploitation of the massive skills in both the public and private sectors. Key decisions will revolve around: how much public and how much private sector involvement? What framework and what tools will be available to us?

The AMA and its constituent societies have a key role to play in

building the future. If I were to list dos and don'ts, I would list them roughly like this:

Do:

- Orient programs more toward the public than has been the case in the past.

- Work from facts rather than wishes, to a greater extent.

- Stay close to your own area of competence—the practice of medicine, its quality and its essence. Your integrity here will produce the right pressures on the political and economic environment.

- Be consistent. Can you preach a free market, yet not provide wide options in methods of delivery? Can you say that only physicians can judge their peers, yet say it is too difficult to do? Can you fight proprietary exploitation by insurance or drug companies, yet sanction conflict of interest within proprietary hospitals?

- Become committed to participation in hospital management rather than taking shots from the sidelines.

- Make sure that the AMA, state societies, Association of American Medical Colleges, specialty societies, and foundations don't become widely fragmented and antagonistic. Develop effective liaison to reinforce all of them and give them direction toward a successful, broad end result.

Don't:

- Be fearful. Support what you really believe in, even if it gives you

control of a lesser empire.

- Produce the mechanics of public relations without a sound product behind it.

- Overreact. Learn to spot posturing and harassment in contrast to a really substantive issue.

The AMA is doing things well today, attempting to broaden its membership and supporting various federal programs. But your ultimate strength will come through productivity, not through vocalizing; through meeting demonstrable need, not generating your self-image.

The AMA must learn to be responsive and to negotiate well. Busy MDs can't address all complex issues effectively. The real key is the spirit that animates the organism and stimulates organized medicine's participation in a series of public policy decisions that will involve consumers as well as providers in a reasonably sophisticated merger of specific interests.

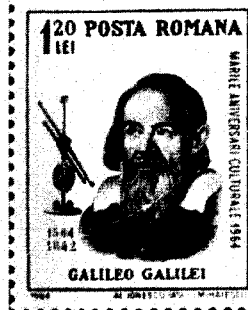
In my view, if we make reasonable responses to the basic issues we face, there will be ample opportunity for solo as well as group practice, for fee schedules as well as per capita payments, for various arrangements within HMOs and similar organizations.

The practicalities of financing and delivering health care point this way. Only an unthinking response would make it different.

Astronomer Sets Basis for Scientific Method for Medicine.—The works and thoughts of Galileo Galilei led to a more scientific approach to the study of medicine. Medicine became experimental rather than philosophical—observations and the scientific method could be applied to medicine.

Galileo was born in Pisa, Italy, in 1564 and is reported to have received an MD degree from the University of Pisa in 1589. Forsaking medicine for science, he became the greatest astronomer of his time and was a staunch supporter of the work of Copernicus.

His physical researches had a great influence



on physiology, zoology, and botany. Galileo invented a crude thermometer or thermoscope about 1593, and later he conceived the idea of using his own pulse to test the synchronous character of a pendulum's vibrations; this led him to the converse proposition of measuring the rate and variation of the pulse by a pendulum.

He died in Arcetri near Florence, Italy, in 1642 and has been honored philatelically as a great scientist of the Renaissance by Italy; Hungary, Czechoslovakia, Romania, Russia, Paraguay, Nigeria, and Panama. The Romanian stamp (Scott No. 1647) was issued in 1964 on the 400th anniversary of his birth.—M. A. Shampo and R. A. Kyle

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SPECIAL ARTICLE

TECHNOLOGY AND HEALTH CARE

KERR L. WHITE, M.D., JANE H. MURNAGHAN, B.A., AND CLIFTON R. GAUS, M.H.A., Sc.D.

Abstract People's needs, not availability of technology, should determine policies and priorities for its application in health services. Technology can improve efficiency and assist in solution of problems, but cannot "drive the system" or cure all ills. Fragmentation of markets, lack of organized health-care systems, and absence of national policies and standards are serious deterrents to technologic innovation. To avoid costly failures, we should concentrate initially on applications that reinforce services of demonstrated efficacy and affect large numbers of patients and providers. Before

widespread adoption, we must rigorously test and evaluate the cost effectiveness and acceptability of these applications. Areas offering the greatest immediate potential for technologic applications include management information systems and "do-it-yourself" tests and devices for ambulatory medical care, hospital-discharge abstract systems, automation of commonly performed procedures in clinical laboratories, emergency-care systems for defined populations, restorative devices, and new communications media for health education.

WIDESPREAD interest, discussion and advocacy of aggressive introduction of "technology" into all aspects of the "health-care delivery system" has resulted in the establishment of no less than nine federal panels, task forces and committees charged with examining the issues involved. Actual and anticipated reductions in the defense and aerospace budgets and resultant unemployment of engineers, the Administration's interest in promoting research and development in general to stimulate the economy and offset the unfavorable balance of trade, and urgent public insistence that we improve social-service systems, such as those responsible for education, housing, transportation and health, have all contributed to making the role of technology in medicine an important public and professional issue. This concern is shared by virtually all industrialized countries.^{1,2}

The purpose of this article is to examine the immediate prospects in the United States for large-scale application of technology in the provision of health services.

FACTORS AFFECTING THE USE OF TECHNOLOGY

At the outset, it is worth examining the considerations and constraints that should guide the choice of technologic applications in the field of health services and determine the direction of our research-and-development efforts. It is difficult to estimate how much effort and money has been invested in health-care technology in the past decade because there is no general agreement on the meaning of the term itself. But even if we define health-care technology broadly as the systematic application of the fruits of industrial, engineering and communications sciences to the solution of practical problems in health care, it is fair to say that progress has been disappointing and success stories few and far between.³ It is therefore important to think rather more closely about the generic problems of technology and health care before we redouble our efforts.

At least seven major considerations affect the choice and success of technologic applications in the immediate future.

The first is that health care is not a manufacturing industry, but a service industry in which the personal aspects are valued, and health-care organizations are social systems. Technologic methods and innovations should be applied to health-services systems not because these methods are available and feasible, but because they materially assist in meeting the needs and demands of people for health care. Technologic innovations that do not serve socially determined ends are unlikely to contribute much of practical utility and can add substantially to the costs of medical care.

As a corollary to this point, the needs and demands of people must be specified before technologic methods can be successfully employed. Technology cannot solve problems that require other measures such as the creation of formal health-care organizations with defined objectives. Many potential applications of technology must await the development of explicit national policies and standards for health services and the evolution of centers for decision-making in what is now a fragmented industry.

The third consideration is that the problems we tackle initially by technology should affect large numbers of people and their health problems and large numbers of health personnel and institutions rather than events affecting few people and providers. There are a number of reasons for using this criterion⁴: costs per episode of illness, health problem, or person cared for can be minimized when economies of scale and aggregation of markets exist; skills required to achieve established standards of quality can be developed and maintained when large batches of services or products are processed by technologic means; changes in attitudes and behavior that condition the applications of technology are most likely to occur when "critical masses" of both consumers and providers exist; and acceptance of technologic innovations is most likely when accompa-

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nied by increased satisfaction for large numbers of providers and consumers.

Fourthly, technology can and should be used to enhance efficiency whenever possible. This may take the form of economies in inputs of labor, physical capital or, perhaps most important, expensive human skills. However, the nature and extent of the proposed savings should be estimated carefully before technologic innovations are advocated. Many technologies generate new and unpredictable costs, and the savings can prove illusory. Large computer systems, for example, require highly skilled personnel to operate and maintain the systems, back-up systems in case of failure, and capital funds for periodic modernization.

Fifthly, there is little hard scientific evidence that many of our medical treatments, regimens and procedures are efficacious.⁵ We should avoid heavy investments in technology that automates or otherwise attempts to increase the efficiency with which we provide services of dubious efficacy and concentrate in areas where the underlying methods of treatment have been demonstrated to prevent, cure and ameliorate disease.

Sixthly, technologic applications should be advocated on the basis of evidence that they are both "worthwhile" and "practice ready" if costly failures are to be avoided. They should be preceded by studies of clinical and administrative efficacy and cost effectiveness, taking into consideration operating and service reliability, safety hazards, performance standards, calibration problems, and redundancy requirements. Scientific and technologic work leading to invention and development of prototypes should be followed by related studies on marketability and acceptability before innovation is advocated.

Finally, controlled field testing, evaluations and large-scale applications of technology require adequate numbers of suitably sized settings each with the requisite resources to support the effort, trained manpower for managing, operating and servicing it and the interest and means to evaluate it.

Applications of technology in health care that are widely advocated at present are physiologic monitoring, automated multiphasic screening, and computerized medical-information systems. It is not our intention in this discussion to dwell at length on the limited potential for prompt application in these areas but rather to focus on major opportunities in conformity with the guidelines described above. However, some comments seem indicated.

The difficulty with physiologic monitoring systems is, first of all, that they are largely hospital based and applicable to a relatively small segment of the total burden of illness in the population and, secondly, that they are being widely installed before their efficacy and costs have been demonstrated. The largest investment has been in hospital coronary-care units, although probably less than 1 per cent of hospitalized patients in

the United States can expect to benefit, judging from available statistics on the causes of admission. Furthermore, the efficacy and cost effectiveness of these units in the total scheme of care for cardiovascular disease is being seriously questioned.⁶ At this stage it is virtually impossible to retreat, and it may be that the hospitals and the public are saddled with an expensive and yet frequently inappropriate mode of treatment.

Multiphasic screening is limited by our knowledge of the efficacy of the many procedures advocated. Few have been adequately field-tested in properly designed, controlled clinical trials. One critical appraisal of the evidence suggests that screening is worthwhile for only six conditions: dislocation of the hip and phenylketonuria in neonates, hearing and vision in children, and rhesus factors and bacteriuria in pregnant women.⁷ This appraisal is based on the availability of adequate measuring instruments, scientific knowledge of the prognoses for patients with apparent abnormalities, and the existence of acceptable and effective treatments for these abnormalities. Another group of conditions is more controversial: carcinoma of the bronchus, carcinoma of the breast, carcinoma of the cervix, and bronchitis. Clearly, much research and evaluation is required before multiphasic screening clinics are widely advocated. This is now the official position taken by the National Advisory Council on Regional Medical Programs.*

Computerized medical-information systems constitute an inordinately confusing array of hardware, software and fuzzy thinking. The central question about information is not "How can we computerize the medical record and all available data generated by hospitals, laboratories, physicians, administrators and other health personnel?" but "Who needs to know what and why?" The most succinct analysis of this problem is contained in studies of the potentials for computer applications in the Scottish Health Service.^{8,9} To summarize contemporary thinking in this field, development of health-services information systems should be governed by four P's: the data should be parsimonious, problem-oriented, person-specific and population-based. From these elementary beginnings, larger routines and ad hoc, general and dedicated systems can be evolved.

IMMEDIATE PROSPECTS FOR TECHNOLOGY IN HEALTH CARE

Turning now to particular areas that appear to meet most of the guidelines summarized above, we see seven possibilities for the widespread application of technology in the near future.

Patient and Practice Management Systems

Health-maintenance organizations, medical-society foundation plans, group practices, and other organiza-

*United States Department of Health, Education, and Welfare, Health Services and Mental Health Administration, National Advisory Council on Regional Medical Programs. Report of Subcommittee on Automated Multiphasic Health Testing, May 11, 1971 (mimeographed).

tional arrangements responsible for the care of defined populations require systems to manage their multiple practices and to care for their patients. They are essential to foster preventive medicine by, for example, keeping track of appointments, following up patients with chronic disorders, and monitoring immunization levels of populations. They are also essential for linking patients' problems with services used and their costs.

Management information systems for physicians' offices that incorporate health inventories, patient-encounter data (not medical histories), laboratory data, prescribing data and charge data are now available. Small computers can handle data for physicians in group practices and clinics and for aggregations of physicians and their patients at the local level. The packages should be integrated so that complete systems will provide information for clearly specified purposes in machine-readable form. The market for these systems is expanding rapidly, and they urgently need development to the point of marketability and application.

Laboratory Support for Primary Care

An unknown number of laboratory tests are performed annually for ambulatory patients. Like laboratory tests for hospitalized patients, many are probably of "unsatisfactory" quality.¹⁰ Some may be inappropriate or useless, and a few may be harmful or unduly hazardous.

To make effective use of technology in this area, we must first establish national standards for diagnostic instruments, reagents, tests and test kits that assure efficacy, reliability, validity and safety. The absence of standards, coupled with fragmentation of the market, discourages industry from investing in research and development on many potentially useful products in the health field. Considerations should be given to establishing regional centers to regulate, monitor, and encourage the use of laboratory reagents, equipment and tests (and perhaps therapeutic instruments) through combined efforts of the National Bureau of Standards, the Food and Drug Administration and the Center for Disease Control. It may also be necessary in some instances for the federal government to identify potential opportunities for technologic solutions and solicit competitive bids and ideas through the use of RFP's (requests for proposals). This stage should be followed by full funding for the construction of a prototype by one firm, with a guarantee that a sufficiently large quantity of the units will be purchased to ensure profitability. The units could then be sold, leased, lent or donated to organizations or systems that would use them effectively. This is, of course, the approach used by the Department of Defense, and there seems no valid reason why it should not be employed in the health-care industry.

Among the many laboratory applications of technology ready for widespread development or use in ambulatory-care practices are "dip-sticks" and test kits that include reagents and sometimes instruments for physicians' offices, and "do-it-yourself" specimen kits

for cervical cytology, sputum cytology and pregnancy testing. The market is enormous, as is the need for the establishment of standards and regulations to assure quality.

Hospital Discharge Abstract Systems

Utilization and peer review appear essential if hospitals individually and collectively are to tackle the central issues of use, cost, quality, and efficiency. Parsimonious collection of a minimal data set, through uniform hospital patient discharge abstracts and claim forms that relate persons, health problems and hospital charges to populations and institutions, has more power to influence medical-care costs, hospital utilization, standards of care, and health-services planning than any other health-information system likely to be available in the foreseeable future. It is the only information system that will permit us to make comparisons in utilization, clinical performance and charges of hospitals within communities and between communities. Decentralized systems that can aggregate data according to prescribed definitions and standards for a variety of local, state, regional and national purposes are quite feasible. The content, terms and definitions of the minimal data set have been established by the United States National Committee on Vital and Health Statistics, and the computer technology exists. Both non-profit and profit-making data-handling organizations are available to develop this information base promptly. The operating cost of these systems, now regarded as essential by other Western countries with sophisticated health-care systems, is less than 50 cents a discharge, as compared to an average hospital bill of \$664 in 1970, and this expense is readily recovered through savings in current practices for preparing discharge summaries, routine indexes and claim forms in hospital medical-record rooms and business offices.¹¹ The need is great, and the market vast; only the decision to stimulate or implement the systems is lacking.

Automated Clinical Laboratories

There are about 2000 hospitals with 200 beds or more and about 600 with 500 beds or more in the United States out of 7000 hospitals. The market for fully automated clinical laboratories in this and other settings is therefore small. To achieve greater versatility, development should focus on sub-systems as well as complete prototype laboratories, and more attention should be given to batch processing of commonly performed tests rather than to multi-channel analysis of single specimens. Cost-effectiveness measurements in relation to populations served and patient-care problems resolved are critical in determining the market for automated laboratory equipment.

Emergency Care

The central problem in the provision of emergency care for defined populations is identification of the agency or institution responsible for organization, quality, command and control. Transfer to civilian set-

tings of organizational and technologic methods developed by the military depends on resolution of this issue. In essence, the question regarding community emergency services is: "Who is in charge?" Is it to be any or all hospitals in the community, the health department, the fire department, private ambulance firms, or organized health-care systems that provide a full range of services, of which emergency care is one element? The problems of authority and organization are critical to the full application of technology for these services. Two developments merit further detailed study:

Centralized crisis centers. Poison control centers in hospitals provide an organizational base for centralizing both emergency calls and medical-reference services needed by the public and physicians. A common telephone number (911) directing all calls automatically to the center nearest the caller could start with verbal responses to inquiries about sources of information and services. The initial system could be expanded in a variety of ways to include, for example, dispatching and monitoring of ambulance calls, answering inquiries from physicians about adverse drug reactions, optimal therapy or potentially hazardous therapy for readily diagnosed conditions, or providing computer-assisted replies to inquiries about the management of relatively common but potentially complicated problems such as electrolyte imbalances, allergic reactions and cardiac arrhythmias. Further extensions, which could include terminals in physicians' offices with on-line, real-time computer access, could be extremely costly but might be warranted in the long run as part of a support system for physicians' assistants, nurse practitioners and other "physician-extender" personnel.

The knowledge, technology and organizational bases exist for this development. It builds on the present capacity to meet widespread urgent needs and could expand in a variety of ways in different settings. The market should be substantial, and requirements for equipment would range from modest to highly complex.

Rescue and recovery services. Integrated emergency service systems for managing automobile, industrial, agricultural and domestic accidents require prototype development in communities where the issues of authority and responsibility have been resolved. Technology, particularly as developed by the military, can contribute not only to the design and equipping of ambulances, helicopters, minibus rescue units and emergency rooms, but also to the problems of communications and transportation. These services, in turn, could be expanded to embrace broader systems for all patients served by a health-care organization.

The development, testing and evaluation of a series of prototype systems in suitable urban and rural communities should precede their widespread linkage to centralized crisis centers. Each of the two kinds of modules could be linked to health-maintenance organizations or other forms of health-care systems.

Restorative Aids and Devices for the Handicapped

The market potential for sensory aids, mobility aids

and modular prostheses and devices deserves further study. It is estimated that there are at least 4 million persons in the United States with severe impairments in mobility due to neurologic diseases alone, and an equal number of totally blind or deaf persons. The benefit from improved functional capacity and related increases in employability and decreases in dependency should be substantial. As with laboratory supports for primary medical care, industry is deterred from investing in restorative devices because of the absence of national standards for efficacy, reliability, and safety, high costs of development, and uncertainties about the size and stability of the markets. Collaboration between the federal government, industry, and university schools of medicine and engineering offers the best prospects for increasing the effectiveness of technology in this area. Regional biomedical engineering centers supported in part by governmental funds could provide the setting for this co-operative effort.

Health Education

Recent advances in audiovisual systems and the advent of "wired cities" offer new possibilities for providing health education for the general public, instruction of patients with common acute or chronic diseases or health problems, and continuing education for physicians. Commercial firms, the National Medical Audio-Visual Center, Regional Medical Programs, medical societies and voluntary agencies have all had experience in this field. The technology is fully developed, but the problem of motivating people to use these educational opportunities needs further study before the market can be effectively exploited. This market can be reached by expanding the projects of medical societies, hospitals, universities, and Regional Medical Programs.

Like other problems in health care, the application of technology in the interests of meeting people's needs depends upon the purposeful organization of health services. The reason we have a "crisis in health care" is that biomedical research has made medical care efficacious. We must now make it effective, equitable and efficient. To these ends, technology, like improved financing and health-insurance mechanisms, can assist but it cannot "drive the system." Services must be related to the needs of populations, and organized to meet them. As in other facets of human endeavor, technology can become an extremely effective means to worthwhile ends. It is not an end in itself.

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Consumer health education*

A rural reconnaissance

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SINCE ITS INCEPTION IN 1966, the Mountain States Regional Medical Program has been slowly, but deliberately, developing the capability of health workers and consumers to design programs for improving the quality of health care in the mountain states of Wyoming, Montana, Nevada, and Idaho. During the past five years, our program development efforts in these states have enriched our understanding of consumer concerns and interests as well as health manpower needs and problems of organizing and maintaining health care services. Promoting a sense of "health consumer citizenship" in the Rocky Mountain region has been, and will continue to be, a herculean task, particularly considering the paucity of community and school

health activities in this region. However, as a health planner committed to the educational process as the *sine quo non* to desirable social change, I remain optimistic that consumer responsibility for health and well-being is an attainable goal.

The Rural Area

The geographic area stretching from New Mexico and Arizona to Idaho and Montana is punctuated by plains, mountains, and desert. Sparse population, limited metropolitan areas, rugged terrain, vast distances, and inadequate transportation give rise to unique problems for those of us who are attempting to improve the accessibility and quality of health care services. Health planning on a regional basis is compounded by vast distances, unpredictable weather patterns, and poor commercial transportation services. Consequently, smaller communities tend to be provincially oriented.

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Although health personnel appear to be flocking to the few metropolitan areas, it is becoming increasingly difficult to attract physicians and other health workers to small, isolated communities. Long-standing statistics give vivid testimony to the general movement of physicians away from communities of less than 2,500, creating serious gaps in the availability of primary care services. This lack of physician services is particularly acute in Montana, Idaho, and Wyoming where approximately 45 per cent of the population lives in communities of 2,500 or less.¹ This discussion is directed to conditions and concerns in these states in which the population is primarily rural.

Wyoming, Montana, Idaho, and Nevada by numerous definitions are "medically underserved". In 1969, the national ratio of physicians per 100,000 population was 163; within the four-state area the rate was 105.² While older physicians offering primary care in rural areas are retiring, young physicians do not replace them. Instead, they settle in urban areas.³ Maldistribution of personnel results in insufficient numbers and kinds of health workers in extensive rural sections.

Few organized community health units (local health departments) exist in these states. To illustrate this point, in Wyoming there are 23 counties. Of this number, two counties have local health units, neither of which employ a full-time health officer. Ten Wyoming counties are without public health nursing services. None of Wyoming's local health units nor the State Health Department employs a public health education specialist. Needless to say, developing comprehensive consumer health education in rural areas will require considerable tooling-up of health care services and personnel. It is doubtful that traditional public health units (local or regional health departments) are feasible in these states. Lack of financial commitment for health affairs, sparse population, and the unwillingness of health care personnel to live and work in rural areas are major obstacles. Establishing behavior patterns conducive to "consumer health citizenship" is therefore dependent on approaches which recognize and effectively deal with these constraints.

A closer examination of consumer characteristics will shed some light on the complexity of health care planning in rural areas.

Consumer Characteristics

Who is the consumer of health care services in the four-state area and what does he actually know about health and health care? To seek answers to these questions, the Mountain States Regional Medical Program, with the assistance of the System Development Corporation of Santa Monica, California, conducted a mail survey of 9,600 households in Wyoming, Montana, Nevada, and Idaho. Nearly 50 per cent of the households responded. The full report of the survey has been published,⁴ and the principal findings and conclusions will be summarized.

Economics of Health Care

The average yearly income for consumer households studied was found to be slightly above \$6,000. There is a consistent relationship between income and attitudes toward health care and ability to meet the costs associated with that care. Those with annual incomes below \$9,000 (61.5 per cent of the respondents) expressed disproportionate concern that medical care is too expensive, regular dental checkups are too expensive, and regular physical examinations are too expensive. Those households with total annual incomes under \$6,000 also were, by and large, underinsured. Throughout the region approximately 40 per cent felt that they had insufficient financial means to cover the costs of major health and medical expenses.

Looking at the same questions from a population perspective, a similar pattern is revealed—the smaller the community, the greater is the economic impact of preventive medical care. This fact is most pronounced in communities with populations of 1,000 or less. Remote ruralness has other interesting impacts. While approximately 15 per cent of the respondents for the entire region claimed they had to travel too far for medical care, almost half of all consumers whose households are in communities of 1,000 or less face this problem. These people normally travel

out of state for medical care at a rate three times greater than do residents of communities with population of 25,000 or more. They are also at a disadvantage when it comes to hospitalization. Only 17 per cent are within ten miles of a hospital and such a facility is at least 25 miles away for more than 50 per cent of the households.

Knowledge levels and practices of this rural public pose some cogent questions for those concerned with consumer education and preventive medicine. Greatest familiarity is expressed with the warning signals for cancer (57 per cent), next for heart disease (42 per cent), and least for stroke (28 per cent).[‡] Education level enhances knowledge, but even so, only 65 per cent of the college attendees are familiar with cancer signals, 49 per cent with heart disease signals, and 33 per cent with stroke signals. Age makes a difference in familiarity with warning signals. The middle age group (40-54) was most familiar with all three. However, the youngest group (under 40) was more familiar with cancer signals than the oldest (over 55), and the opposite held true with regard to heart disease and stroke. Approximately 80 per cent considered regular medical and dental examinations to be necessary, while almost one-half have neither regular medical nor dental examinations. More than nine out of ten claim that smoking is hazardous, but 43 per cent reported that they smoked.

The educational needs from these responses are apparent. Moreover, the data suggests that differential approaches to consumer education may be in order. These differential approaches would consider the type of method as well as its content and should be examined for appropriateness on the local level. For smoking dangers and for the importance of preventive examinations, the disparity between belief and practice suggests the need for imaginative, aggressive programs.

Desire for information pertaining to the prevention and detection of heart disease, cancer, and stroke is high and surprisingly uniform for all areas within the region with interest being expressed by between 80 and

90 per cent of the consumers. The majority of the consumers felt that information received from their physicians was adequate, although approximately 17 per cent felt that not enough time or not enough information was given. Primary sources of information were listed as magazines, television, newspapers, radio, and special literature, in that order. These, however, are not the preferred media. Special literature was at the top of the list, followed by television, magazines, educational movies, and talks with health professionals. The rural consumer selected adult education courses and contacts by voluntary health workers in a higher proportion than did consumers residing in the larger cities.

The Mountain States consumer feels that medical services are generally satisfactory; but for approximately 25 per cent of consumers, the preventive measures that would alleviate long-range socioeconomic costs are considered to be beyond the consumer's economic grasp. Those who claim they cannot afford medical care are most likely to indicate dissatisfaction with the care they do receive.

Finally, the consumer's desire for more information, his behavior in seeking health care, and his assessment of available care all suggest further analysis particularly on an area basis within the region. Variations observed in terms of population groupings, educational levels, and income levels highlight the need for more refined analysis.

Recommendations

In regard to the need for consumer health behavior analysis, health planners and officials are poorly informed about consumer health knowledge, misconceptions, opinions, and attitudes. Of course, there are broad generalizations advanced about consumers, but for the most part our understanding relative to consumer predispositions and knowledge is wholly inadequate. Hence my first recommendation is the establishment of a network of Consumer Health Behavior Study Centers affiliated with schools of public health and/or other health science education centers. These study centers should be geographically

[‡]Question pertained to warning signals of cancer, heart disease, and stroke; other diseases and conditions were not included in the question.

placed so as to assure analysis of multiple consumer groups and life styles.

A second recommendation pertains to schools of public health, which unfortunately, are reluctant to place graduate students for field practice in rural areas with limited resources. Although their reasoning is understandable, i.e., students will not obtain a fully rounded experience, this stance is most discouraging. Public health students could be helpful in identifying health care needs and stimulating rural consumers to get actively involved in health affairs. Furthermore, when public health trainees graduate, they might be willing to move to rural areas if they were exposed to the advantages of rural life.

The small community hospital is the subject of a third recommendation. The community hospital is an ideal setting for the placement of health education specialists to develop comprehensive health education activities in rural areas. A complete program could be developed which would harmonize patient information needs with school health instruction, adult education, and traditional public health education activities. To encourage hospitals to carry out this function of comprehensive community health education, financial assistance at the national level would be essential.

My final comments relate directly to the Panel and the President's Committee on Health Education. Throughout the years, numerous federal health projects were created to improve our nation's health. A large per cent of these national efforts, such as chronic disease control, maternal and child health, migrant health, Indian health services, comprehensive mental health centers, immunization programs, and others, have consumer health education components. This approach has led to health education through bits and pieces rather than fostering a comprehensive health education program. Fragmentary approaches often have low payoff. It seems that the President's Committee on Health Education is in a position to make a positive contribution to the physical, mental, and moral well-being of the American public. History will tell us whether the Committee's contribution is productive or irrelevant. The charge is clear; we can't have more of the same. The time has come for us to be accountable for our efforts.

Those of us in the public health education enterprise, if I may call it that, are striving hard to do our job. We would all agree that we are quite busy. However, in the words of Thoreau: "It is not enough to be busy; so are the ants. The question is: What are we busy about?" •

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Hypertension: Deficient Care of the Medically Served

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Deficiencies in the detection, treatment, and control of hypertension before hospitalization have been shown by a survey of 185 patients admitted for various surgical procedures unrelated to hypertension. From their current status or previous history, 51 patients were classified as hypertensive. Twenty-six of these were currently hypertensive; 10 of these (6 of whom were previously unrecognized) had never received treatment, and 8 had discontinued therapy. Among 25 patients currently under treatment, 8 were hypertensive, and 10 others had blood pressures above normal. These conditions could not be attributed to lack of access to medical care, since all but three patients had visited a primary source of medical care within the past year. Discontinuation of treatment by the physician or patient was the predominant reason. A change in both physician and patient behavior is critical for the success of hypertension-control programs.

THE VALUE of treating patients who have hypertension has been asserted in numerous reports. That morbidity and mortality from hypertension can be reduced has been shown by the often-cited Veterans Administration studies, in which not only severely hypertensive patients (patients with diastolic blood pressures over 115 mm Hg) benefited from therapy (1) but also patients with moderate hypertension (diastolic blood pressure, 90 to 114 mm Hg) (2). Further analysis of the latter group indicated that the effectiveness of therapy was related to the level of blood pressure; it was more consistent in those with diastolic blood pressures in the range of from 105 to 114 mm Hg but variable and dependent on associated factors such as age, and prior cardiovascular, renal, or central nervous system abnormalities in those patients with diastolic blood pressures of 90 to 104 mm Hg (3). The VA studies, al-

beit done in a somewhat selected population, confirm previous studies and provide new incentive for the detection and evaluation of all individuals with elevated blood pressure, the long-term control of moderate to severe hypertension, and the therapy of selected cases of mild or labile hypertension. Complementing these studies is the report of the Inter-Society Commission on Heart Disease Resources, which describes a protocol for detection, follow-up, and management of hypertensive patients (4).

In addition to these considerations, the Greater Delaware Valley Regional Medical Program (GDVRMP) has a special interest in hypertension. Hypertension is a major, treatable factor contributing to morbidity and mortality from cardiovascular and renal disease (diseases on which the Regional Medical Program continues to focus). Its prevalence, especially undetected and uncontrolled hypertension, is presumably high because of the greater proportion of medically underserved among the region's population. Educational programs on hypertension, especially for the continuing education of physicians (a familiar role for Regional Medical Programs), could be helpful in its control. Finally, allied health professionals can play a significant role in the control of hypertension.

Since prevalence data were available from the National Health Survey (5), it was deemed unnecessary to survey the region anew. Rather, it seemed appropriate to adjust these data according to the age, sex, and race make-up of our population. Although the data confirmed our assumption that the prevalence of hypertension in the Greater Delaware Valley region was higher than for the U.S. (16.6% versus 15.3%, for ages 18 to 79 years; and 23.5% versus 21.6%, for ages 35 to 79 years), the degree to which the disease was undetected, untreated, or inadequately treated was still unresolved.

There were alternative approaches to answering these questions, such as screening programs, inpatient and outpatient chart reviews, or surveys of office

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practice; the one chosen was to study those persons who had found their way into the medical care system. Whatever the degree of deficiency found for those in the system, there was undoubtedly a greater deficiency in the general population. This report describes the methodology and results of the study.

Methods

One hundred and eighty-five patients, age 35 years or older, were studied in four hospitals before undergoing various surgical procedures, none of which were for treatment of hypertension. The hospitals were a representative sample, selected by size, geographic location, and presence or absence of house staff and medical school affiliation. The willingness of anesthesiologists to participate was also a factor in the selection. A four-part questionnaire* was completed by the anesthesiologist during his preoperative examination. This method was chosen because it was assumed that the anesthesiologist would normally obtain information about hypertension and related drug therapy during his routine preoperative visit, and he therefore would be able to complete the questionnaire with a few minutes additional time. If time permitted, the questionnaire was completed each day for all patients seen preoperatively by the anesthesiologist. When this was not possible, a number was assigned to each patient to be seen on rounds, and a predetermined total of numbers was drawn at random from a "goldfish bowl"; these were the patients whose questionnaires the anesthesiologist completed on that day.

The questionnaire consisted of four parts: I, identifying information; II, chart review; III, patient interview; and IV, classification. Parts II and III provided the information for Part IV. The history and mode of detection of the hypertension, drug therapy, source of medical care, and current blood pressure recordings were noted. A pretest of the questionnaire was conducted on 26 patients at one of the participating hospitals. An average of 15 to 20 minutes additional time was required for its completion, but considerably less time was needed for the normotensive patients. Since only a slight modification in the questionnaire was made after the pretest, the data on these 26 patients are included in the totals.

Data from the questionnaire were coded for com-

* Questionnaire available from the National Auxiliary Publications Service of the American Society for Information Science, c/o CCM Information Corp., 866 Third Ave., New York, N.Y. 10022. Order Document NAPS 01953, remitting \$2.00 for a microfiche or \$5.00 for a photocopy.

puter analysis. Because of the small number of patients the analysis was actually done manually.

Classification

The classification of patients was based on history as well as current status. This identified patients previously treated for hypertension who were either no longer hypertensive or normotensive under treatment, as well as the currently hypertensive or borderline-hypertensive patients. Although a history of hypertension could not always be confirmed by previous blood pressures recorded in the chart or known to the patient, it was assumed that a patient who had been treated for hypertension had an elevated blood pressure at the time the treatment was initiated. When a classification of borderline or hypertensive was based on current status only, at least two blood pressure readings were required to be assigned to these classifications. The classifications were made by the anesthesiologist and reviewed by the author. The classifications, by the blood pressure criteria of the National Health Survey (5), were as follows:

Hypertensive (A systolic blood pressure greater than or equal to 160 mm Hg or a diastolic blood pressure of 95 mm Hg or greater, or both.)

1. All patients with hypertensive blood pressure this admission.
2. Regardless of blood pressure this admission, all previously hypertensive patients who had been or were currently under treatment.

Borderline-Hypertensive (A systolic blood pressure less than 160 mm Hg and a diastolic blood pressure less than 95 mm Hg, but not a systolic blood pressure less than 140 mm Hg with a diastolic blood pressure of less than 90 mm Hg.)

1. All patients with borderline-hypertensive blood pressure this admission but not previously or currently treated hypertensive patients.
2. All patients with normal blood pressure this admission who were previously borderline-hypertensive and who had been or were currently under treatment.

Normotensive (A systolic blood pressure of less than 140 mm Hg and a diastolic blood pressure of less than 90 mm Hg.)

1. All patients with normal blood pressure this admission who were previously normotensive.
2. All patients with normal blood pressure who were previously hypertensive or borderline-hypertensive but who were not previously or currently under treatment.

Table 1. Age and Sex Comparison in 185 Hospitalized Study Patients and the GDVRMP Populations*

Age	Men		Women		Both Sexes	
	Patients	GDVRMP	Patients	GDVRMP	Patients	GDVRMP
yr			%			
35-44	8.7	12.6	22.2	13.5	30.9	26.1
45-54	9.2	13.4	15.1	14.7	24.3	28.1
55-64	11.9	10.4	12.4	11.9	24.3	22.3
65 or older	9.7	9.6	10.8	13.9	20.5	23.5
Total	39.5	46.0	60.5	54.0	100.0	100.0

* GDVRMP = Greater Delaware Valley Regional Medical Program. % = percent of total population age 35 years or older.

Table 2. History of Hypertension of 51 Untreated and Treated Hypertensive Patients

Age	Untreated			Treated		
	With History*	Without History†	Total	With History*	Without History†	Total
yr	← no. →					
35-44	4	0	4	4	0	4
45-54	4	2	6	5	0	5
55-64	9	2	11	9	0	9
≥65	3	2	5	7	0	7
Total	20	6	26	25	0	25

* History of hypertension from chart, interview, or from both chart and interview.
 † No history of hypertension from either chart or interview.

Results

Table 1 shows the age and sex distribution of the survey population, with comparative data for the population of the Greater Delaware Valley area. These data indicate that the sample of the population surveyed conformed closely to that of the entire region, with the exception that white men aged 35 to 54 years were under-represented and white women of from 35 to 44 years of age over-represented.

The distribution of the survey population according to the classifications previously described was as follows: 51 patients (27%) were classified as hypertensive, 26 (14%) of whom were not currently under treatment; 26 patients (14%) were borderline-hypertensive, none of whom were under treatment; and 108 patients (58%) were normotensive. The 27% classified as hypertensive is greater than the 23.5% anticipated from the National Health Survey data, which were adjusted for the age of our study population. But the National Health Survey data were based on current status and did not take into account a previous history of hypertension (see below).

The presence or absence of a history of hypertension among the 51 hypertensives is analyzed in Table 2. All patients currently under treatment and 77% of those not currently under treatment had either been told they were hypertensive or, as indicated in the hospital chart, their physicians were aware of the presence of hypertension. The six patients without a history of hypertension were all currently hypertensive, and none had received treatment at any time.

To determine why patients were not being treated for hypertension, several factors were analyzed. One factor was the possible lack of a primary source of medical care. All patients, however, whether hypertensive or not, identified a primary source of medical care (Table 3). Furthermore, the percentage of patients who had visited their primary source in the past year was higher for the hypertensive and border-

line-hypertensive patients than it was for the normal patients, although the difference was not significant ($P > 0.6$). Comparison of the treated with the untreated groups of hypertensive patients who had a history of hypertension (Table 4) shows that the treated patients were more likely to have been seen for hypertension within the past 3 months. It would be anticipated that patients under treatment would be seen at more frequent intervals, but the relatively large number of known, untreated hypertensive patients not seen for at least a year suggests inadequate follow-up.

In further analyzing the causes for lack of treatment, however, failure of follow-up ranked among the lowest. Of the 26 patients not under treatment, there was failure of follow-up in only 1. Nine patients, one currently borderline and eight currently hypertensive, had either discontinued treatment themselves or by the advice of their physicians. Treatment had been discontinued in another five patients whose blood pressures had returned to normal. Of the other 11 patients not under treatment, 6 did not have a history of hypertension and presumably were previously undetected hypertensives, treatment was deferred pending further evaluation in 1, and the reason was unknown in 4 patients.

Table 5 shows the current status of the survey population. In contrast to the previous tables, the

Table 3. Patient Visits in Past Year to Primary Source of Medical Care

Primary Source of Medical Care	Normal Blood Pressure		Borderline Hypertension		Hypertension			
	Visit	No Visit	Visit	No Visit	Untreated		Treated	
					Visit	No Visit	Visit	No Visit
	← no. →							
Physician	83	10	23	2	20	2	22	1
Hospital clinic	9	3	0	0	2	0	2	0
Other	3	0	1	0	2	0	0	0
Total	95	13	24	2	24	2	24	1

Table 4. Interval Since Last Visit to Physician or Clinic For Hypertension: Untreated and Treated Patients with History of Hypertension

Interval	Patients	
	Untreated	Treated
	<i>no.</i>	
Less than 1 month	3	4
1 to 3 months	4	15
More than 3 to 6 months	2	4
More than 6 months to 1 year	0	1
More than 1 year	5	1
No data	6*	0
Total patients with history of hypertension	20	25
Total patients hypertensive at admission	26	25

* All six seen by primary sources in past year, not necessarily for hypertension.

classification of these data is based on the blood pressure readings at the time the survey was conducted, irrespective of previous history. With this selection of blood pressure values for classification, which provide data comparable to those of the National Health Survey, 26 (14%) of our patients were hypertensive, a prevalence less than the 23.5% expected for the Greater Delaware Valley population of age 35 and older. Comparisons within each age, sex, and race group indicated that the fewer older and fewer black hypertensive patients, and more middle-aged, white male hypertensive patients in the survey population accounted for the differences. Of particular importance were the findings that, of a population of 26 currently hypertensive patients, hypertension was unrecognized in 6 (23%); 10 patients, including these 6, (39%) had never received treatment; and 8 (31%) had discontinued therapy. An additional 29 borderline-hypertensive patients (16% of the survey group) were not under treatment. Furthermore, 8 (32%) of the 25 patients under treatment were still hypertensive, and ten (40%) had blood pressures that remained above normal levels.

Discussion

The main objective of the study was to determine whether the extent of undetected, untreated, or inadequately treated hypertension in the Greater Delaware Valley area was comparable with that reported by other studies. A secondary objective was to determine the reliability of the survey methodology. Although the study was not undertaken to determine the prevalence of hypertension in the area, the methods used in the study did show an overall prevalence of hypertension acceptably close to that expected. When prevalence data were compartmentalized by age, sex, and race, there was a poorer correlation,

which could be anticipated from the small numbers in each group, despite the finding that the distribution of the survey population conformed closely to that of the entire region. It is evident that a larger study would be necessary if we wished to direct our attention to one or more of these individual groups, but the data obtained from the survey strongly suggest that these methods could be used in such a study.

With respect to the main objective, the study confirmed our assumption that the extent of the problem of the detection and management of hypertension in the Greater Delaware Valley area is the same as in other parts of the country. Wilber and Barrow (6) have reported on a survey conducted in Atlanta, Georgia. A comparison of the results of this study with those of the Wilber and Barrow (6) study, in which the criteria were adjusted for age, and with data from the study of Wilber and colleagues (7), where the criteria were unadjusted as in our study, is shown in Table 6. Our data compare more closely with that of the adjusted data of the Wilber study because of the process of selection in both studies. Making the criteria for hypertension more stringent for the unselected population of the Georgia survey had an effect on the results similar to that of the selection in our survey of a population in the medical care system—namely, a decrease in the percentage of patients with undetected hypertension and hence an increase in the percentage receiving medication and under control. On the other hand, selection had no effect on the percentage of patients receiving medication who were under control, since the same criteria for control were used, and all such patients were obviously receiving medical care. Thus, where selection was not a factor, all three sets of data are quite comparable.

Table 5. Current Status* and History of Hypertension of 185 Patients

Current Status of Patients	History of Hypertension	No History of Hypertension	Total
Never treated			
Normal	2	106	108
Borderline	5	21	26
Hypertensive	4	6	10
Previous but not current treatment			
Normal	5	0	5
Borderline	3	0	3
Hypertensive	8	0	8
Under treatment			
Normal	7	0	7
Borderline	10	0	10
Hypertensive	8	0	8
Total	52	133	185

* Based on current blood-pressure status.

Table 6. Comparison of Hypertension Surveys

	GDVRMP Study*	Wilber Study*	
		Unadjusted	Age-Adjusted
Patients examined, no.	185	6012	6012
Elevated blood pressure †, %	22.9	28.5	22.6
Taking medication for hypertension, %	13.4	13	13
Hypertensive patients †, no.	43	1713	1358
Unknown, %	14	27.1	19.4
Taking medication, %	58	45.4	57.3
Under control ‡, %	39.5	28.6	36
Taking medication under control ‡, %	68	62.9	62.9

* The definition of hypertension for the GDVRMP and Wilber unadjusted studies was a blood pressure greater than or equal to 160/95 mm Hg for all ages; for the age-adjusted Wilber study hypertension was defined for ages 15 to 39 years as greater than or equal to 160/95 mm Hg, for ages 40 to 64 years as greater than or equal to 170/100 mm Hg, for ages 65 years or more as greater than or equal to 180/110 mm Hg. GDVRMP = Greater Delaware Valley Regional Medical Program.

† Includes borderline-hypertensive patients and normotensive patients currently under treatment.

‡ For all studies control was defined as less than 160/95 mm Hg.

Unlike reports such as that of Frohlich and colleagues (8), who have audited hospital charts to determine deficiencies in the detection, evaluation, and treatment of hypertension during hospitalization, our study used a hospital population to obtain information concerning these deficiencies before hospitalization. Our study thus reflects the status of hypertension in the ambulatory setting, and therefore, our results bear directly on the place where the detection and proper management of hypertension must be conducted—in the clinic or the physician's office.

Conclusion

The study has shown that even among a group of currently hypertensive patients who had visited a primary source of medical care in the past year, hypertension was often unrecognized or untreated. Furthermore, when treatment was initiated, it was frequently discontinued or ineffective.

Screening programs for the detection of hypertension, as recommended by the report of the Inter-Society Commission on Heart Disease Resources (4),

can reduce the number of undetected hypertensive persons. But unless the follow-up and management protocols suggested in that report are carried out, there will not be an appreciable reduction in morbidity and mortality. For, as this study has confirmed, it is necessary that the physician recognize the need for initiating treatment of hypertension and that both he and the patient recognize the need for effective control of the blood pressure over an extended period of time.

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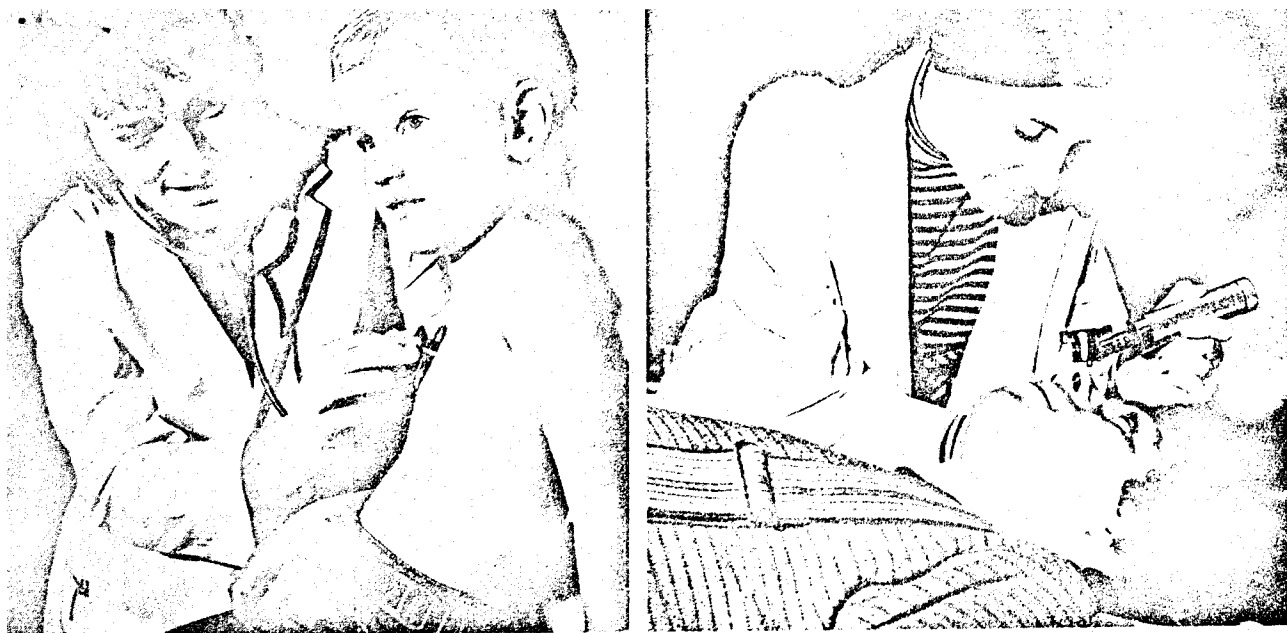
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Darrington's Different Solution

BY MARGARET A. NEWCOMBE

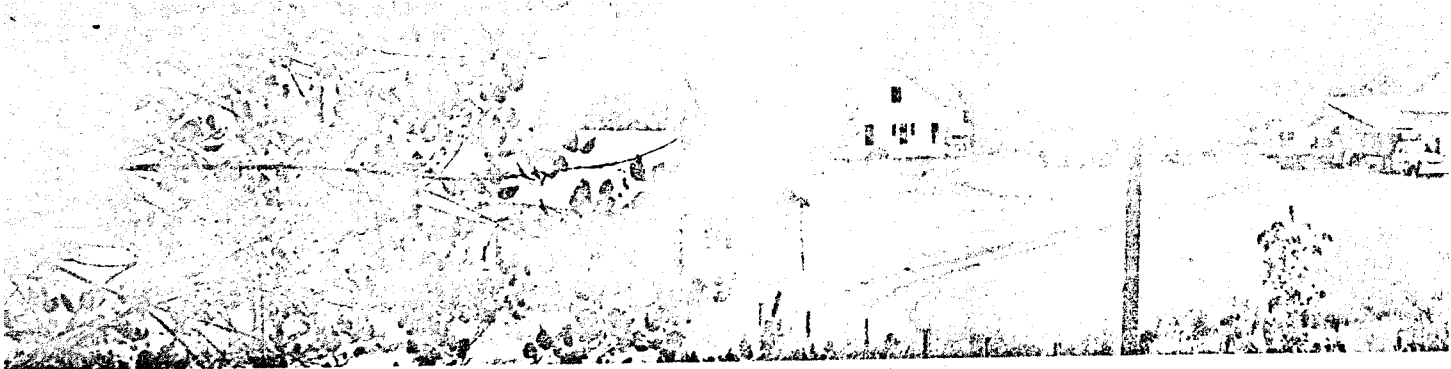
**After nearly eight years of advertising, "Darrington Needs a Doctor!"
the sign at the town limits now reads,
"WELCOME, GRETCHEN and LYNN!"**

Everybody in the district knows that the greeting is for two registered nurses who operate the Darrington Clinic and are available for emergencies 24 hours a day. Besides the 1100 residents of this small lumbering town, tucked into the western slope of the Cascade Mountains in northwest Washington, the nurses' patients also include the 1300 farmers and lumberers in the surrounding area.

Since April 10, 1972, when most of the town turned out for the Clinic opening, complete with cookies and cake, the two RN's have recorded an average of 600 patient visits a month. They have been loaded aboard a helicopter to reach an accident deep in the woods, have ridden the town's fire engine-cum-ambulance for emergency calls, and have delivered a baby that wouldn't wait.

All the while they have been under the microscopic inspection of health planners, state agencies and other communities, not to mention the lights of the TV cameras and the barrage of questions from newspaper reporters from big cities and small towns alike.

What makes the Darrington Clinic interesting to all these groups is not only that it is the first rural clinic in the state to be operated by primary care



nurses, nor that it points a new way to deliver medical care to isolated communities, but that the Clinic, like its signs, is homemade and homegrown.

This small community organized itself to find its own solution. In an effort to entice a resident physician, it built and equipped a modern clinic in 1967. It made its plight known by advertising far and wide. Finally in the fall of 1971, it called upon the Washington/Alaska Regional Medical Program for help; an organization which wrestles almost daily with the maldistribution of doctors problem.

This Regional Medical Program (RMP), one of the 56 in the country, covers territory that encompasses one fifth of the land mass in the U.S. Its area of activity includes medical communities spread farther apart than Los Angeles and Chicago. The ratio of physicians to population varies enormously. For example, the physician ratio in the densely populated Greater Seattle area is one for 380 persons while in smaller Washington and Alaska districts there may be only one M.D. for 8,000 persons.

The community health service program of the RMP was organized in 1970 to provide help to local communities outside the large metropolitan areas. It maintains a staff of seven field representatives to aid communities in identifying their health needs, documenting them and organizing to meet them. One representative was assigned to answer Darrington's call for help.

Together with the community, all possible avenues for delivery of health services were explored, such as a National Health Services Corps assignment, use of a Medex, sharing of physicians. Eventually, having elected a Board of Trustees, the community decided to try the nurse practitioner solution. RN's willing to live in Darrington and participate in the experiment were interviewed. Two public health nurses were selected, the Clinic was refurbished, and the sign was repainted. In April, ten months after RMP was first contacted, the Clinic opened. The Board has responsibility for the operation, provides maintenance, bookkeeping and promotional services, struggles with the bills and untangles the miles of inevitable red tape.

RMP helped explain the function of the Clinic to doctors and public health officials, secured the back-up services of a physician in Arlington, 37 miles

away, provided additional training for the two nurse pioneers and granted three month's seed money to put the Clinic into operation.

Both the town and the nurses are happy with the arrangement. The nurses deal with day-to-day problems, from sutures to well-baby clinics. They consult frequently with the back-up physician in Arlington, refer patients to their own personal physicians and to the Arlington hospital when necessary.

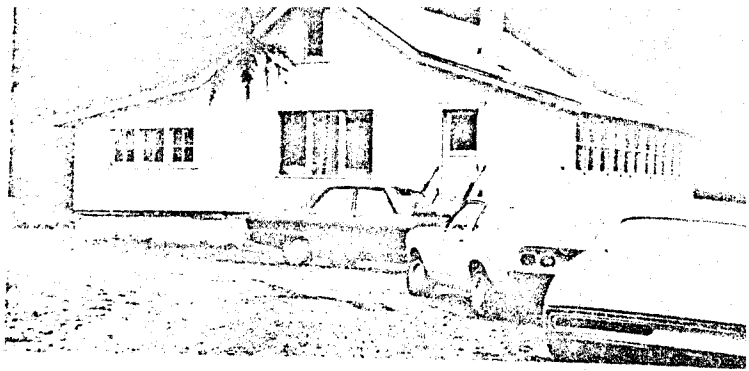
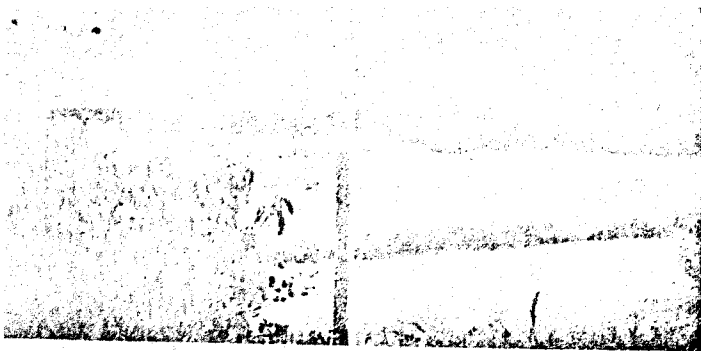
Third-party payment is one of the biggest rocks in the road. At present the Clinic pays 75 percent of its way. Fund-raising events and donations from community businesses and industry make up the difference temporarily. The Clinic receives payments from private insurance companies, State Division of Social and Health Services (welfare) and Medicaid, and from the State Department of Labor and Industries, but is still unable to collect Medicare payments as regulations require a physician to be physically present.

The congressman from the Darrington district, with another Washington State colleague, is pressing Social Security to make Washington a demonstration area and allow Medicare payments to properly organized and supervised nurse practitioner clinics. Because many elderly people live in the lower-rent rural areas, this is an important point.

Already other communities are trying Darrington's health manpower solution. Two nurses operate a clinic for 6,000 residents on Vashon and Maury Islands in Puget Sound. Residents there conducted a house-by-house survey and formed a community Board of Trustees. A physician from the "mainland" in nearby Seattle attends the clinic two days a week and additional backup is provided by several hospitals in Seattle.

Farther north in Puget Sound, in the unincorporated area of Longbranch, a third nurse clinic opened late in October. It, too, is a community effort, the result of a health survey by local volunteers. It is open Friday and Saturday during daytime hours and serves seven smaller communities in the area that are without public transportation. A public health nurse is volunteering her time for the first three months to get it started and residents hope to find a retired nurse to take over later.

The wavelike effect does not stop with new clinics. The Washington State Nurses Association will



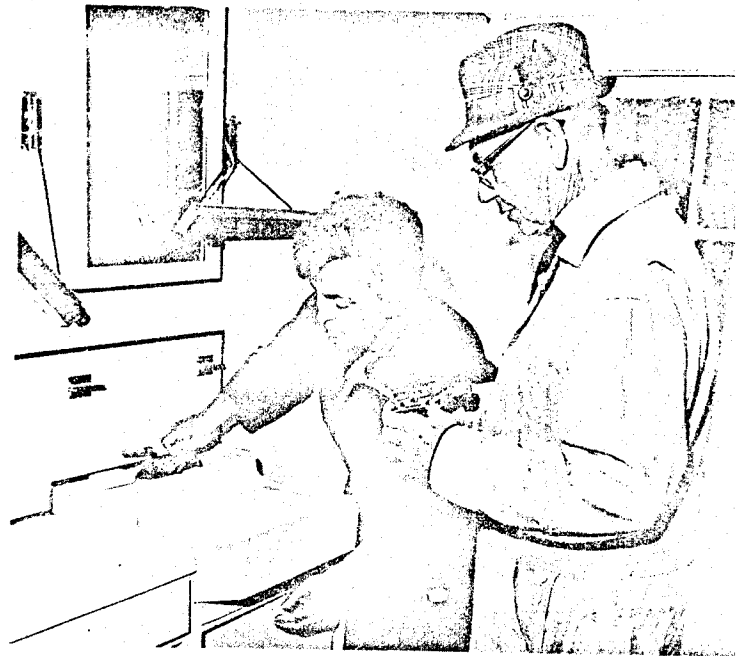
attempt to revise its Nurse Practice Act in the 1973 state legislature session to give legal status to this new nurse practitioner, as California, Idaho and New York have already done.

The School of Nursing at the University of Washington, recognizing the growing need for such practitioners in rural areas and for the provision of long-term care as well, prepared a proposal to train, place and evaluate nurses in their independent role. The proposal was approved by the W/A RMP Advisory Board and awaits funding decisions next May.

Making health care available and accessible to the majority of our citizens, wherever they happen to live, is a vast problem. There are many pathways to this goal. With the growing conviction on the part of many, including some physicians, that the doctor cannot be the sole provider of medical services, the role of other health personnel will change and expand. The nurse clinic is one answer to a complicated problem.

Ms. Newcombe is a communication specialist on the staff of the Washington/Alaska Regional Medical Program.

An old parsonage in the Puget Sound back country is refurbished into a clinic with help from volunteer Roger Hill and Nurse Jeanne Brodsack.



Vashon Island Clinic and RMP staffs discuss the nurses' new role.

A System of Patient Care Based on Patient Needs

In this "Nurse Utilization: A Patient Care Systems Project," the emphasis was on starting with the patient and his needs and then designing systems to meet them. As the authors point out, "... if patient needs are designed for, the nurse will be utilized correctly."

JANET M. KRAEGEL • VIRGINIA SCHMIDT
RAMESH K. SHUKLA • CHARLES E. GOLDSMITH

THE primary purpose of a hospital or extended care facility, it is generally recognized, is to meet the patients' needs. People within the institution work within their disciplines or departments to carry out this purpose directly or indirectly. Thus, physicians write diagnostic notes and therapeutic orders; nurses specify how the care process should be carried out; and administrators and department heads decide on policy, procedures, and equipment. All of these persons expect that

their decisions will meet patients' needs in the best possible way, and without increasing the already high costs of hospital care.

But are the patients' needs actually being met? This is debatable. Hospitals subject the patient to bedlam, according to Friesen.¹ Taylor speaks of the dehumanizing effects of the admission process.² Duff and Hollingshead report how the socio-psychological dimensions of the patient care process are ignored by the health team.³ When the staff of the project to be described here asked 100 senior nursing students if they felt patients' needs were being met in the various clinical settings, only one student answered in the affirmative.

If the hospital organization is indeed not meeting its primary purpose, there is reason for tremendous concern. Basic needs are at once biochemical, neuromuscular, and psychological states. And a hospital's failure to provide effective systems to meet these basic needs can retard the patient's progress and

recovery, regardless of the excellent "disease care" he may receive. The question then to be asked is: what occurs to so radically displace the best intentions and decisions of hospital personnel and professionals as they endeavor to meet patient needs in their everyday work situations?

Patient care systems within the hospital are complex. Every decision made with the intention of meeting patients' needs has numerous ramifications, some of which may create problems elsewhere or cancel out the effectiveness of decisions made by another area of operation. An example is the way in which a new unit management system can be disruptive. Often, when unit management starts making unaccustomed demands on ancillary departments, the resulting resistance maneuvers can cause even more complex procedures to be developed, thereby increasing everyone's work load.

Those who are called upon to make institutional decisions, there-

The four authors composed the interdisciplinary team for the project described in this article. MRS. KRAEGEL and MISS SCHMIDT, both of them nurses with masters degrees from Marquette University, Milwaukee, Wisconsin, served as project director and associate director, respectively. MR. SHUKLA, with a masters in industrial engineering from the University of Wisconsin, Madison, was the systems design engineer, and DR. GOLDSMITH, who holds a doctorate in clinical psychology from Boston University, was the project psychologist.

fore, need some way to assess all aspects of the situation, to understand the intricate interplay of the various parts of the total system. Of greatest importance, they must be able to identify and acknowledge the primacy of the patient's need requirements when a decision between alternate solutions is called for. It is the inability to do this that causes the discrepancy between the ideas of the hospital organization and the actual process of delivering care.

A SYSTEMS APPROACH

This article describes a demonstration project that used a specific systems approach to identify the relationship between the hospitalized patient and what is required to meet his needs. A multidisciplinary project staff, assisted by the personnel on the study unit, 1) identified needs of the hospitalized patient; 2) followed a specific design strategy to determine the best systems to meet these needs; and 3) implemented these systems of patient care on a 39-bed medical-surgical unit in a community hospital.

The care systems were designed outward from the patient into all parts of the hospital rather than organizationally, department by department; in other words, we started with what the patient needed, rather than how the departments and their personnel traditionally functioned. This approach turned the entire focus of hospital processes onto total patient requirements and resulted in the development of 16 unique systems designed to meet patient needs—a sleep and rest system, a sociopsychological observation system, and an orientation system among others. And, as the many systems were interrelated to form a unified whole for implementation, basic concepts emerged which can be applied in the restructuring of any care setting.

BEGINNINGS OF THE PROJECT

This project, we believe, not only speaks to health care professionals in terms of the decision-making pro-

cesses it establishes to meet patient needs, but also attests to what can be accomplished when a group of dedicated professionals work together in their own community to make changes in the delivery of health care.

When the hospital administrators in the Hospital Council of Greater Milwaukee Area decided to "do something about the nurse shortage," members of the Milwaukee League for Nursing (now a Community Action Group) asked to work with the administrators. The result was a joint committee of six members (three from each organization), who worked together in arriving at a mutually determined course of action.

In the process, they identified two factors: (1) the probability that the nurse shortage resulted as much from poor utilization as from a numbers shortage; and (2) the lack of perceivable benefit from nurse utilization studies to date. They concluded that a project should be developed to demonstrate a total plan and model of efficient and effective patient care. The model, once developed, would be used for learning and actual work experience by hospitals throughout the state, it was decided.

Step by step, this committee enlisted the resources of the community. It enlarged its membership to obtain a broad working base, using representatives from varied nursing educational programs, the state board of nursing, the hospital area planning council, a physician, a consumer, additional administrators, and a hospital public relations director. The administrator of St. Mary's Hospital, Milwaukee, Wisconsin, offered the facilities of that hospital for the demonstration unit. The dean of the University of Wisconsin-Milwaukee School of Nursing offered a home for the project, and faculty appointments were provided by the University of Wisconsin-Milwaukee and Marquette University. A project proposal was drafted, approved by the Wisconsin

Regional Medical Program, Inc. (WRMP), and funding was appropriated through WRMP as of September 1969.

An initial search of the literature revealed that most nurse utilization studies were concerned with what the nurse was doing and how she perceived her role, but only rarely was any objective rationale presented for what the nurse *should* be doing. Neither was there clear identification of the complex and interrelated factors that prevented the optimum use of nursing skills even when the nurse was relieved of many non-nursing tasks.

In order to study the factors that affected the nurse's functioning, we decided to use a systems approach in the structuring of the project, and sought the assistance of industrial engineers in WRMP to find the most appropriate systems method. The IDEALS Concept, a systems design strategy, was chosen.⁴

IDEALS CONCEPT

This approach emphasizes designing for the *function to be accomplished* by the system. (The words "function" and "purpose" are used interchangeably in this design strategy.) It soon became obvious that the function of the hospital system is not to utilize nurses, but to take care of patients.⁵ Therefore, the focus of the project gradually turned from nurse utilization to patient care. The assumption was that if patient needs are designed for, the nurse will be utilized correctly.

As a result, the project's original title, "Nurse Utilization," was maintained, but with the addition of "A Patient Care Systems Project," to reflect the new focus. This focus, together with the original intent of setting up a demonstration, resulted in two purposes: 1) to design a system of patient care based on patient needs; and 2) to demonstrate this system to hospital health care personnel in Wisconsin.

Three features of the IDEALS Concept design strategy—designing towards a meaningful and necessary

function, using the deductive method, and involving people in the design process—made this approach highly appropriate and effective for our project.

First, *designing towards a particular purpose* focuses on the results to be obtained, not the problem to be solved. The question, "What are we really trying to do?" (purpose of the system) is asked, instead of the more customary, "What is our problem?" As a result, the planning group begins immediately to seek the system that *ought* to be there, and does not merely try to change the system that *is* there.

Second, *the deductive method* asks, in essence: "Forgetting what exists, what would be the ideal way of accomplishing the purpose?" Instead of studying things as they exist and then attempting to change them, a "best conceivable" system is developed, and what exists is brought as close to this ideal as possible. The creativity of this methodology, we believe, enabled the project to blast its way out of the deep roots of patient care tradition.

Finally, the IDEALS Concept, with its emphasis on *meaningful involvement of people*, states that the people who work in the system

should help design it. To this end, project staff met in weekly workshops with all unit personnel (nurses, clerks, aides, as well as patients) and with support department personnel (dietitians, pharmacists, and so on) when the latter's areas were related to the system being developed. A total of 2500 manhours spent in these workshops over a 12-month period resulted in the rough design of 16 patient care systems.

The contributions of the study unit personnel toward the design of our new patient care systems, we found, were the most essential resource in the project. The exposure of the same information to a variety of persons gave a many-faceted orientation to the problem and assured a decision based on a wide range of information. At the same time, as personnel found their ideas being incorporated into a new way of doing things, they readily accepted innovations, and in many instances could barely tolerate waiting until the changes took place.

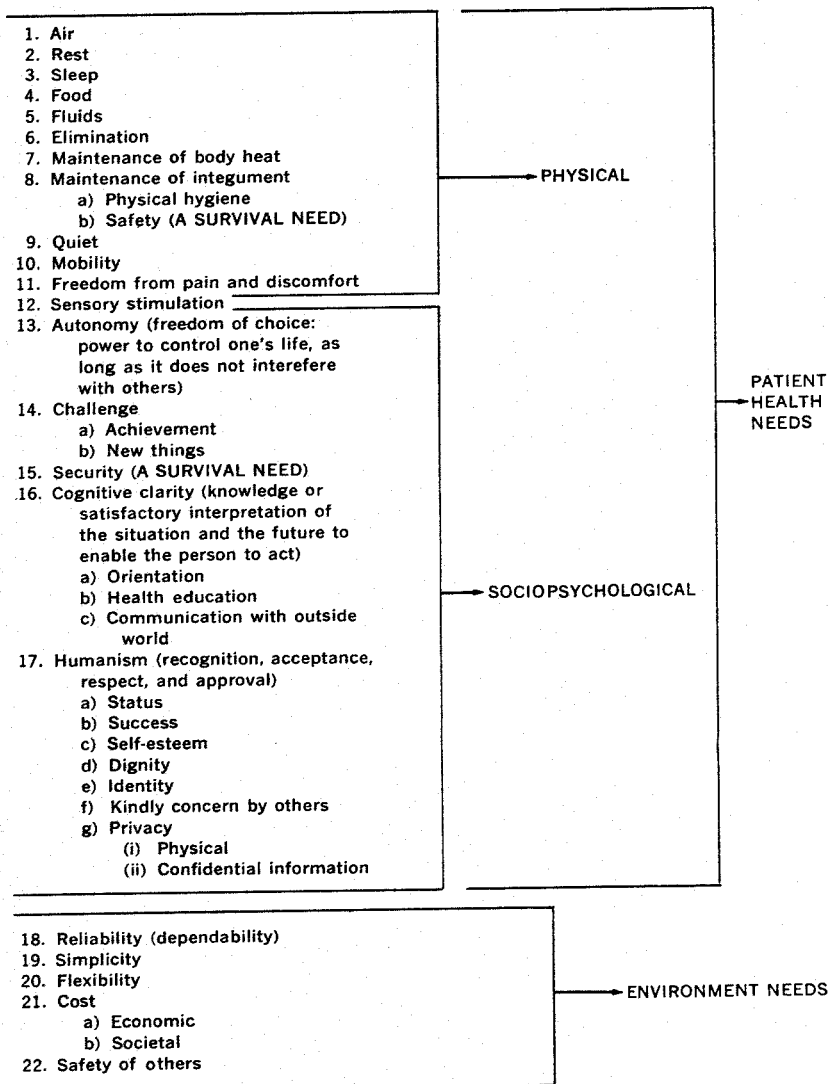
PATIENTS' NEEDS

If we are ever to develop an effective approach to health care, it is our belief that that approach must stem from man's basic physical and sociopsychologic needs. An early step in the project, therefore, was to identify those needs, as shown in the diagram on the left.

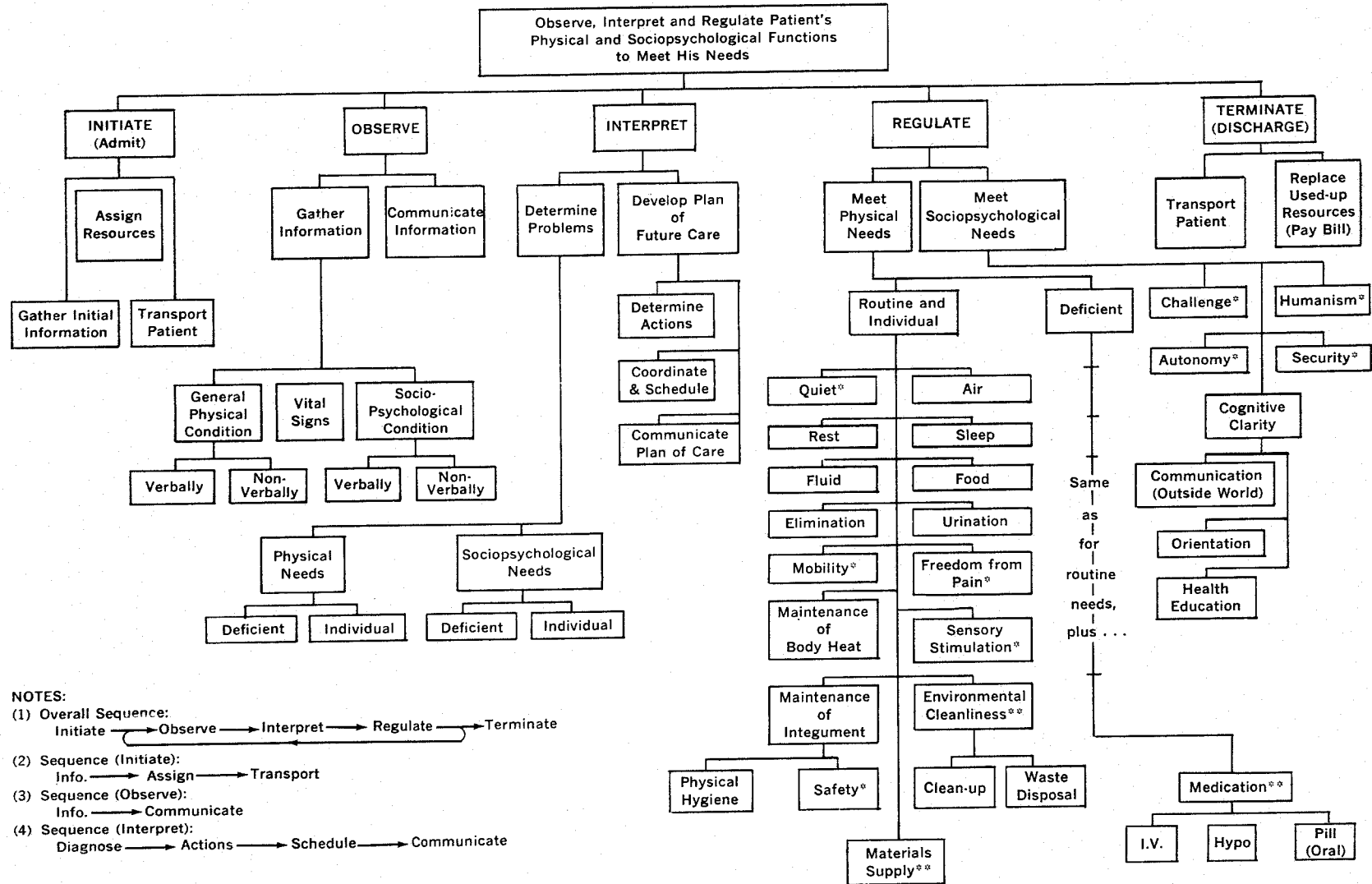
Drawing on the concepts of Malinowski, Murray, Maslow, and Montague, we first identified the basic physical needs.⁶⁻¹⁰ We then added the sociopsychologic components, some of which have been identified by Sidney Jourard as requiring satisfaction if an organism is to develop and maintain mental health through a time of illness and recovery.¹¹ Then we formulated these sociopsychologic components in terms of the patient's needs for autonomy, challenge, security, cognitive clarity, and humanistic attributes.

The overall rationale for this set of needs was found in the project's emphasis on maintaining the sense

PATIENT NEEDS



PATIENT CARE SYSTEMS



NOTES:

- (1) Overall Sequence: Initiate → Observe → Interpret → Regulate → Terminate
- (2) Sequence (Initiate): Info. → Assign → Transport
- (3) Sequence (Observe): Info. → Communicate
- (4) Sequence (Interpret): Diagnose → Actions → Schedule → Communicate

*These components will not be specifically designed for unless the needs are insufficiently met by other systems.

**These components are not "logically similar" to the others; however, they are sufficiently important parts of most of the others that they can be designed more effectively as a separate component.

of the person as an individual in patient care. A specific rationale was developed for each need, but space limits us to describing only one as an example.

Autonomy—Taylor recognized that there is a technique which turns "sick people into patients."¹² This process, she explains, methodically moves a person from autonomy—that is, a sense of freedom of choice—to a sense of dependency, exemption, undesirability, and temporality.

One way that patients can exert control over what happens to them is to influence the decisions about their care that are made by the staff. It has also been shown that those patients who were told of anticipated unpleasant experiences and led to expect they could take actions to influence what happened had shorter hospital stays than patients who were not given such expectations.¹³

In addition to the 22 needs identified, we recognized that the project design must take into consideration the need for communication with patients of widely varying socio-economic and cultural backgrounds. The impact of family structure and family relations on disease and stress was also considered. Then, with the addition of five universal systems requirements (environmental needs), we were ready to begin designing.

PATIENT CARE SYSTEMS

The project incorporated the identified needs into an overall system that would carry out the unique purpose of a hospital. The system's purpose was stated as follows: to observe, interpret, and regulate a patient's physical and sociopsychological functions to meet his needs.

This functional statement was broken down into components arranged according to the steps through which the patient proceeds during the care process—admission, observation, interpretation of observations by the health team, regulation, and discharge—and these components were divided into even smaller components to facilitate their handling in the several workshop sessions. Each component had its own functional statement in terms of patient needs, and these always contributed to the overall

function of the hospital system, as shown in the diagram on the left.

It was not possible to design all of the systems identified, but development of this overall structure directed attention to the relative importance of the parts within the structure and helped us to interrelate the various subsystems into a total and effective system of patient care. The following systems were roughly designed: Admission, Sleep and Rest, Food and Fluids, Plan of Care, Communication, Verbal Observation, Vital Signs, Sociopsychological, Physical Hygiene, Elimination, Materials Supply, Infection Control, Patient Orientation, Patient Education, Medication, and Discharge.

Each system included the inputs, outputs (including communications), procedures, equipment, environment, and workers required to meet the specific purpose for which it was designed. A list of specific criteria was developed for each system, with the identified needs playing an important role. For example, the need for privacy was a prime criterion in the elimination system, safety in the medication system, and security in the sleep and rest system.

The roughly designed systems included a myriad of ideas and detail—everything from requiring physicians' orders when an elective admission is scheduled to stating the bed height that will allow a weak patient to sit up and ambulate. Just the idea of placing a pad and pencil at every bedside made it possible for patients to jot down their questions as they occurred, thereby meeting their need for cognitive clarity.

As the component parts were gradually pieced together to form the final systems, we were all surprised at what emerged, for we had started without any hypothesis or preconceived ideas; the functions and procedures evolved from the design process. We ended up without a nurses' station, for instance, because it never became evident, throughout the entire design process, that such an area could contrib-

ute toward meeting patient needs.

Four systems were completely implemented. Because transmission of patient information within the hospital was quickly revealed as a fuzzy, haphazard, and unreliable process, the plan of care and communication systems became two areas of strong concern. We also concentrated heavily on the patient medication system, because the traditional system is so time consuming that its continuation would have left little time for personnel to meet patient needs within the other systems. The materials supply system was the fourth area of concentration. Keeping supplies at the point of use, we found, would not only increase the efficiency of the other systems, it would also keep patient care personnel in close proximity to the patient at all times.

The patient plan of care system evolved as the necessity to coordinate patient care activities was identified. Patient care problems are entered on the care plan, which consists of two 8½ x 11" pages, encased in a flexible plastic backing. This is always kept with each patient. This care plan, which replaces the usual Kardex, is developed by the professional nurse and written in pencil to allow frequent updating. It includes expected length of stay, so discharge can be planned for from the day of admission, and has spaces for the patient's individual preferences, special observations required, diversional activities, and daily schedule.

An adjunct to the care plan are signs written by the nurse and placed by her on the wall at the head of the bed to provide basic information that should be known by anyone approaching the patient. The information is specific to each patient's requirements: "Use log roll," "Visitors allowed only 10 minutes," and the like. Since the professional nurse places the information there, she has the opportunity at the same time to orient the patient to why it is there and how it can contribute to his therapy.



Replacing the traditional nursing station is a central communications console manned by a specially prepared person who responds to calls from both within and outside the unit and notifies appropriate personnel.

The unit personnel are divided into small work groups, each one totally responsible for a limited number of patients. The rationale is that in-depth knowledge of a small number of patients is preferable to superficial knowledge of the total unit population. Since all patient information, including his chart, is in his room, intershift reports are very brief, and personnel begin the day with "plan of care rounds." These, we feel, are the heart and soul of the project in terms of quality care.

PLANNING TOGETHER

On rounds, the members of each work group approach their patients with the care plan in hand. The patient, the professional nurse, and her nurse assistant and/or practical nurse then plan their activities of the day together. Introductions are made, questions exchanged and answered, schedules explained, care plans and wall signs updated, I.V.'s and drainage systems checked, priorities set, and the skills of the work

group members matched to the care requirements of their patient group.

Standard supplies are kept in each patient room in a dual-access (patient room and hallway) supply cabinet. On rounds, the work group members jot down on an "on-call" card the treatment trays, dressings, and other nonstandard items that may be required during the next 24 hours. These cards are collected by a materials supply clerk, who places the specified items in the cabinet during twice-daily rounds. The clerk also carries a pocket pager so she can bring supplies to the room upon request throughout the day.

The cabinet contains the necessary linens, gowns, charts, care plan, patient hygiene articles, and a locked medication drawer for each patient. There is a sealed-off disposal bin for plastic bags of soiled linen, used equipment, and discarded materials, which is emptied daily by the materials supply clerk.

In the patient medication system, the responsibility of getting the right

medication to the right patient at the right time is placed on the persons most knowledgeable about this therapy—the pharmacists. A medication profile of the patient, developed by the pharmacist from the doctor's original transcription, is kept in the pharmacy, and an updated photocopy is brought to the unit daily by the medication clerk, who places it on the inside of the supply cabinet door. When the nurse gives the medication(s), she has only to initial the time given on the copy. Then she sets a timer for the next time a medication is due for that patient, at which time a light will go on outside the room door as a reminder. The nurse is thereby relieved of ordering routine medications, transcribing and checking orders, charting medications given, and sorting medication tickets for use. Because narcotics and sedatives are kept in the medication drawer, she can also respond to a patient's request for pain relief without leaving his bedside.

chart is kept in an unlocked drawer in the cabinet; the latter, however, has an outside label which states "for authorized personnel only.") The physicians also sorely missed the central nursing station where in the past nurses were readily available to meet their needs. Now the nurses are out meeting patients' needs. Gradually, though, most of the doctors have come to accept the new system, and a few have become so enthusiastic about the care given there that they request that their patients be admitted to the study unit.

The nursing personnel had their adjustment problems, too. The transition from task orientation to clinical practice and decision making is most difficult for nurses who have worked in the traditional environment. The nurse tended to use her free time to "help her aides," rather than direct her aides as a resource to herself as she carried out her clinical role. Occasionally, one still sees a nurse making a bed in an empty room. We feel, however, that the staff nurses on the unit are now aware of the job satisfactions that can come from thoroughly knowing their patients, directly using their skills, and seeing patients respond positively to the kind of care possible in this new environment. Their role is now clearly defined, and they have become strong enough to occasionally tell others in the hospital that they are caring for patients and will not be caught in the fetch, carry, transport, and interdepartmental coordinating they were formerly engaged in.

CONCLUSION

In placing primary emphasis on patient needs, our project has stressed the human factors in health care. It has demonstrated, we believe, that patient needs can be identified, assessed, and responded to in such a way as to move a patient through an experience of health care toward a higher health status. When health care delivery systems, whatever their scope, neglect this primary fo-

cus on patient needs, other tangential needs siphon off resources and energy to the detriment of the patient.

Our systems were designed to be self-coordinating—to adjust and re-adjust themselves, as needed. In the former fragmented systems, "break-downs" often resulted in nurses stepping into the breach and "heroically" carrying out responsibilities which may or may not have met patients' needs, but which other hospital personnel relinquished, knowing that the nurse would fill in these gaps. When breakdown occurs in these self-coordinated systems, however, accountability can be directed to the persons or factors which cause it to occur, thereby increasing the integrity of the total system.

In essence, an environment has been developed which completely supports the nursing personnel who must meet the complex care requirements of their patients. With an environment and procedures that put everything at the nurse's fingertips, she can truly function as a professional, making decisions based on her scientific knowledge and firsthand experience with the patient, and appropriately utilizing her highly developed skills in meeting patient needs for knowledge, therapy, and understanding. Of equal if not greater importance, the patient's needs for identity, dignity, security, and orientation are met because the care process truly revolves around and includes him. The total effect is patient-centered care at the patient's room, not chart-centered care at a central nursing station.

To broaden the effect of what has been learned in the project, we have given slide presentations, tours, and in-depth counseling to health care professionals, architects, engineers, and students throughout the state. Two hospitals are committed to designing the concepts into their new facilities. Currently, we are developing a course and manuals, so that what has been learned by our group can be taught to facilitators in health care settings.

The strength of the project, we believe, has been in the "rightness" of starting with the patient. Formal evaluation of the demonstration unit will soon be completed by an outside consulting firm, MEDICUS. Instruments from the University of Michigan studies will allow comparison of the demonstration unit with a control unit in St. Mary's and 55 units in eight other hospitals. By the end of the project, August 1972, we expect to have gained a much greater understanding of *what should be*, not only in the patient care process but also in nursing education and the designing of hospitals in accordance with their primary function: to take care of patients. ■

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Our hardware communication system not only allows two-way communication between the patient's room and a centrally located console, but also has a "people finder" feature which directs the appropriate group member to the patient's room. Personnel register into rooms by punching a color-coded button at the doorway. This is programmed into the central console, which can then show, at any given time, in which rooms what types of personnel are working.

When the patient places a call, there is an immediate response from the communicator who asks, "May I help you?" (The communicator, located in a central control area, is not a nurse, but a person trained to screen calls and direct them to the appropriate nursing personnel.) When the patient states his need, the communicator activates the "people finder" on the console, and can then speak through the door-side unit to the staff member responsible for that particular patient and able to meet his need. The patient's signal, registered at the console, remains lit until someone enters the room and registers in by punching the button. There is also a doorside speaker, which can be used by nursing personnel who wish to obtain information, supplies, medication, or additional help from their group members without leaving the patient's presence.

IMPLEMENTATION

The environmental and equipment changes required for the systems meant that the unit had to be vacated for two weeks in December, 1970. During this time, the unit personnel were given 22 hours of orientation to the expected changes.

When the unit reopened, the traditional centralized medication room, supply room, and nursing station had disappeared; the concept of decentralization had been accomplished. Anyone who has tried to make change knows that the real world of implementation can be an

exciting but hazardous venture. A glimpse of this is seen in a description of opening day.

The study unit opened to six patients January 5th. On January 6th, two of the five project staff members were ill with the flu. The filled food trays were too small for the slots in the refrigerator and ended up in a heap at the bottom; the laundry cart would not fit through the door of the area where it would be stored; the physician's orders would not copy through the temporary triplicate forms being used. Someone burnt out the coffee maker because the instructions were mislaid, the handles on the supply cabinets were missing so they could not be used from the outside, there were no lights in the cabinets for medication giving, the computer printout sheets were not delivered

to the unit as usual, and the personnel were completely at sea without a nurses' station and a Kardex. Two days later the patient census was up to 20, and by January 12 we were in full operation with 36 patients on the study unit.

With this for a kickoff, you can imagine the stresses that we have been coping with on the study unit and throughout St. Mary's Hospital.

From the beginning of the project, a valiant and persistent effort was made to involve medical staff, through monthly lunch meetings, widely distributed minutes of the meetings, appointed liaison representatives, and so on. When the redesigned unit opened, however, most of the doctors were surprised and upset. Their greatest concern seemed to be the relative availability of the chart to the patient. (The



A dual-access cabinet in each room contains the patient's care plan as well as all the linens, supplies, and medications needed for his care.

Medical Economics

Free Clinics in California, 1971

A Socio-Economic Report of the Bureau of Research and Planning,
California Medical Association

THE EMERGENCE DURING THE LAST several years of a drug-oriented sub-culture in American society has influenced the development of a new kind of center for the delivery of health care services, the free clinic. During the summer of 1967, the Haight-Ashbury Free Clinic, under the direction of David Smith, M.D., opened its doors to San Francisco's "street people." Since that time, a number of similar clinics have been started, offering a wide variety of services their development is frequently referred to as the "free clinic movement."

The importance of this new phenomenon for the delivery of health care services to a selected population group in California suggested the need for more definitive data about the various clinics currently functioning. This *Socio-Economic Report* contains highlights of findings from a questionnaire survey conducted among all such clinics in June 1971. In addition to general information, it provides examples of four distinct types of free clinics found in California. The detailed report of findings will be published in the near future.*

Origin and Development of the Movement

Although free clinics began in recognition of the need for treatment of drug abuse and drug-related problems, they are no longer restricted to providing services to the drug-oriented, youth

sub-culture. In addition to this group, free clinics often provide care to the poor of all ages, minority persons, and others to whom the established systems of health care delivery are not readily available or who are unwilling or unable to seek care in traditional health care centers or through physicians in private practice.

Free clinics are each designed to meet the needs of a particular community and therefore, since community needs vary, so do the clinics. Because of this, there does not seem to be any one feature that categorizes a particular operation as a "free clinic." Jerome Schwarz of the Department of Preventive Medicine at West Virginia School of Medicine formulated the following as a working definition of a free clinic for a nationwide survey: "... a program which provides medical, dental, psychological or drug care without charges or red tape." Excluded from his definition are in-residence and methadone programs, counseling by ministers, drop-in referral centers, and programs aimed at a defined population or a categorical disease.

The Southern California Council of Free Clinics in Los Angeles restricts the definition of a free clinic to a licensed, private, non-profit neighborhood health and social service center. Excluded are health centers operating under the sponsorship of a city or county government, or a federal agency. In both cases, the concept of a free clinic implies, in addition to small or no charges per patient visit, confidentiality, and as non-judgmental a climate as is possible in staff attitudes towards patients.

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*Included in this report will be a listing of all known free clinics throughout the state, detailed statistics on sponsorship, and sources of income and services provided, as well as the survey questionnaire used to compile the information.

Data about Clinics Compiled by Questionnaire Survey

In June 1971 the Division of Socio-Economics and Research of the California Medical Association surveyed all 95 known clinics in California which seemed to fall into one of the above definitions of a free clinic. To date, 54 have responded; nine were excluded from the analysis because they do not provide any medical services at the clinic, but rather are "drop-in" referral centers, counseling centers, or in-residence treatment centers.

Of the 45 qualified respondents, 24 or approximately 53 percent are private, independent non-profit corporations. The Los Angeles County Health Department sponsors six clinics. Others are sponsored by private or community organizations, churches and neighborhood associations. One respondent, the American Indian Free Clinic, is sponsored by the Federal Economic and Youth Opportunities Agency. The Delta Health Project in Sacramento is sponsored by the Sacramento County Medical Association.

Sources of income for the free clinics vary considerably. Only three clinics, the American Indian Free Clinic, Delta Health Project and Long Beach Free Clinic receive any federal funds. Another ten are partially state funded and ten receive county funds. Other sources of income include community funds, group and individual donations, private foundation grants, fund raising events such as rock concerts, and street solicitations. One clinic, the Venice Community Family Health Center, has received financial assistance from the local district Los Angeles County Medical Association and from Area V of California Regional Medical Programs.

Most Clinics Located in Major Metropolitan Areas

From the 45 responses it can be seen that free clinics function in at least 12 California counties. Los Angeles County alone accounted for 20 clinics, while San Francisco has seven. Responses were also received from four clinics in San Bernardino county, three each in Alameda and Orange counties, two in Riverside county, and one each in Mendocino, Monterey, Sacramento, San Mateo, Tulare and Ventura counties.

TABLE 1.—Age Distribution of Population Served at 34 Free Clinics

Age	Number	Percent
Under 15	4,000	12.7%
15-19	9,900	31.6
20-24	9,000	28.6
25-30	4,700	15.0
Over 30	3,800	12.1
Total	31,400	100.0

Age and Income Data for Population Served.

A total of 34 respondents indicated the average number of persons seen at the clinic each month and provided an estimate of age distribution of the population served. Table 1 shows the number and percent of the total 31,400 patients served each month by these clinics, according to age group. Approximately 75 percent of the persons seen at these clinics are between the ages of 15 and 30, while approximately 60 percent are between 15 and 24 years of age. Relatively few persons under 15 or over 30 are served at free clinics.

A total of 36 clinics provided estimates of the population served according to income levels. As might be expected, a high proportion of respondents (81 percent) reported that most or all of the population they serve are from families with lower income, that is, less than \$5,199. Only two clinics indicated that less than half of the population served were from lower income families and that 50 percent or more of the population were from higher income (\$7,600-\$10,500) families.

Broad Range of Service Provided

Table 2 lists the types of medical and other services provided at the 45 responding clinics, along with the number and percent of clinics offering each type of service. Services provided by over 75 percent of the responding clinics include general medical care, birth control, abortion counseling, laboratory work, treatment of venereal disease, health education, and job and family counseling. Although 60 percent of the clinics provide treatment for drug abuse, only three, or 6.7 percent of the total, have outpatient methadone programs.

TABLE 2.—*Services Provided at 45 Responding Free Clinics*

<i>Medical services</i>	<i>Number</i>	<i>Percent</i>	<i>Other services</i>	<i>Number</i>	<i>Percent</i>
General medical care	37	82.2%	Health education	37	82.2%
Emergency treatment	29	64.4	Drug education	31	68.9
Dental services	13	28.9	Tutoring	10	22.2
Eye examinations	14	31.1	Counseling (job, family)	38	84.1
Ear examinations	17	37.8	Paramedical training	15	33.3
Problem pregnancy care	24	53.3	Legal services	18	40.0
Pre-natal care	18	40.0	Youth social services	15	33.3
Well-baby care	16	35.6	Draft physicals	6	13.3
Treatment of venereal disease	35	77.8	"Rap" groups	29	64.4
Birth control services	36	80.0			
Abortion counseling	34	75.6			
Laboratory work	34	75.6			
Psychiatric services	27	60.0			
Surgical	6	13.3			
Treatment of drug abuse	27	60.0			
Outpatient methadone	3	6.7			
Detoxification	14	31.1			

Clinics Classified into Three Types

In his national survey of free clinics, Schwarz found that the clinics could generally be classified into three general types: neighborhood, "hippie," and youth. Neighborhood-type clinics are centers providing medical and/or dental care to families in areas where health services are not readily available. The population served is often from a particular minority group. Few neighborhood clinics offer treatment for problems relating to drug abuse. A hippie-type clinic, on the other hand, is one that provides some type of drug care (often including detoxification or rehabilitation) and serves many patients with drug-related illnesses. Youth-type clinics are also organized to give some drug care, although it is often limited to education and counseling. However, these clinics differ from hippie-type clinics in their sponsorship, having generally been developed and sponsored by adults, service clubs or other community groups concerned with problems of drug abuse among high-school students. These last two types of clinics also provide some types of general medical services.

Drug Abuse Treatment Centers Also Surveyed

These three types of clinics, as well as a fourth type, a center organized solely for the treatment of drug abuse, were included in the survey. The

fourth type, the drug abuse treatment center, generally does not provide any medical care services such as general medical care, emergency treatment unrelated to drugs, and treatment for venereal disease. Numerically, 17 of the respondents may be classified as neighborhood clinics, 15 as hippie clinics, 7 as youth clinics, and 6 as drug treatment centers. Although these classifications are not totally finite in terms of defining clinics, each seems generally more representative of one type than another and has been so classified.

Examples of Neighborhood Clinics

Two examples of neighborhood-type clinics are the Telegraph Hill Medical Clinic in San Francisco and the American Indian Free Clinic in Compton. The former serves the North Beach area of San Francisco, a community consisting largely of poor Chinese families. The clinic is staffed by one full-time and one part-time nurse and a part-time registrar who are paid by the city of San Francisco. Volunteer physicians include two pediatricians, two internists, an ophthalmologist, an orthopedist, a gynecologist and a dermatologist. It functions from 9:00 a.m. to 5:00 p.m., five days a week, to provide general medical care, emergency treatment, eye examinations, and light laboratory work. The city Department of Public Health utilizes the clinic

facilities once a week for well-baby care. In addition to these medical services, the clinic offers classes in health education, counseling services, youth social services and informal "rap" groups.

An estimated 340 individual persons are seen at the clinic each month; they average a total of 925 medical care visits. The majority of the population (94 percent) are from a lower economic group. Approximately 30 percent of the population served are under 15 years of age and 30 percent are over 30. The principal source of funding for the clinic is the City and County of San Francisco. If the patient can afford it, however, a minimum fee of \$1.00 is charged in order to help defray the clinic costs.

In January 1970 a group of Indians, with financial and technical assistance from Regional Medical Programs Area V, initiated the planning stages for the American Indian Free Clinic with the purpose of providing medical, dental, legal and other related services to anyone requesting them, but primarily to the estimated 60,000 American Indians of Los Angeles and surrounding communities. Three months later, under the direction of an all-Indian board of directors and an Indian administrator, the clinic began providing telephone information and referral services five afternoons a week by trained Indian aides. In October of the same year, the clinic facility was equipped and staffed to provide medical, dental, clinical and legal services two evenings a week. At present, approximately 300 persons are seen at the clinic each month; 250 of them seek medical care.

Approximately 50 percent of the population served by the clinic are under 15 years of age and 20 percent are over 30. The remaining 30 percent are approximately equally distributed within the 15 to 29 year age group. Half the population is estimated to be from families with incomes of less than \$5,199. Persons of moderate and higher income comprise 30 and 20 percent of the population, respectively.

Examples of "Hippie" Clinics

The Haight-Ashbury Free Clinic in San Francisco and Long Beach Free Clinic are two examples of Schwarz's hippie-type clinic. An important concern of each is the treatment of drug abuse and drug-related illnesses. Both clinics

are staffed to offer drug detoxification. The majority of the population served at each clinic is between the ages of 15 and 25.

The Haight-Ashbury Medical Clinic, the national pilot project for all free clinics, is sponsored by Youth Projects, Inc., a private, non-profit corporation. Primary sources of income for the clinic include funding from private foundation grants for education and research and patient donations.

Although originally developed to study and treat the abuses of psychedelic drugs, the health care needs of the population served demanded rapid expansion of the facilities and services provided. At present the clinic is divided into six separate sections: (1) medical care (including birth control and abortion counseling), (2) dentistry, (3) psychiatric care, (4) heroin detoxification, (5) treatment for drug abuse other than heroin, and (6) a publications department which periodically publishes *The Journal of Psychedelic Drugs*. Like all clinics surveyed, the Haight-Ashbury Free Clinic makes referrals to other health agencies, hospitals and voluntary agencies such as VD treatment centers.

The clinic is one of the largest in California, with an average of 3,000 client-visits per month. The professional staff includes one full-time and 30 part-time volunteer physicians. Other staff include over 100 nurses, psychologists, lay therapists, other paramedical personnel and community volunteers. Although some paramedical personnel are paid, most services are provided on a voluntary basis.

The Long Beach Free Clinic is the largest free clinic in Southern California, averaging 2,300 monthly visits by approximately 1,600 persons. Although no record is kept on the economic status of the population served, it is estimated that the majority are from families with lower income. Approximately 46 percent of persons seen are between the ages of 15 and 20 and 33 percent are between 21 and 24. Only 4 percent are under 15 years of age.

The Long Beach Free Clinic is currently organizing a medical advisory committee whose function will be to advise the medical director on policies, medical functions, and how to deal with problems in providing medical services. The Clinic draws from the services of approximately 60 volunteer physicians representing a

variety of specialties. Additionally, approximately 40 nurses, 50 to 60 other paramedical personnel and 300 community workers volunteer their services to the clinic on a part-time basis.

Besides regular medical, dental and psychiatric services, the clinic has an extensive drug abuse program. In January 1969 the clinic became the first facility in Los Angeles County to do outpatient heroin detoxification and in January 1971, the first non-government facility in Southern California to do outpatient barbiturate detoxification. Detoxification includes physician prescribed non-narcotic medication and psychiatric crisis and group counseling as well as certain social services. The clinic also offers counseling and medical services for amphetamine and psychedelic drug abusers.

Examples of Youth Clinics

Two examples of youth-type free clinics are the Youth Service Center of Riverside, Inc. and the Van Nuys Youth Clinic.

The Van Nuys Youth Clinic is one of five respondents sponsored by the Los Angeles County Health Department. The other four include Hawaiian Gardens Youth Clinic, Santa Fe Springs Youth Clinic, Northeast Health Center and Southeast Health Center. Each clinic has a clinic coordinator or administrator who functions under the health department's Youth Clinics Medical Director.

Approximately 1,700 persons are seen at Van Nuys Youth Clinic each month. Approximately 80 percent are between the ages of 15 and 25, with just 5 percent under 15 years of age. It is interesting to note that 75 percent of persons served are from higher income families and only 5 percent are from the lowest income group. This is not the case, however, in three of the other Los Angeles County youth clinics responding to the survey, (Hawaiian Gardens, Northeast and Southeast), where low income persons comprise between 70 and 100 percent of the population served. Statistics on socioeconomic background are not available for Sante Fe Springs Youth Clinic.

The volunteer staff of Van Nuys Youth Clinic includes nine therapists, six community workers and five social workers. Nine physicians, two nurses, two psychologists, one social worker, one

health director, one nutritionist, and one laboratory technician are reimbursed for their services on an hourly basis.

Youth Service Center of Riverside, Inc., is a private, non-profit corporation. Funding for the center comes from a variety of sources including United Fund, Junior League, and the California Council on Criminal Justice. The center also has a contract with the Riverside Unified School District to teach remedial reading skills to high-school students. A part-time medical director and a medical advisory committee meets informally on an "as needed" basis. The committee also acts as liaison with the Riverside County Medical Association, which has endorsed the clinic.

With the exception of one person who is paid on an hourly basis to keep accurate inventory of equipment and supplies, all persons providing services at the center are volunteers. Professional volunteers include approximately 25 physicians, 25 nurses and five psychologists. The center has over 200 community volunteers, including 95 remedial reading instructors and other paraprofessionals trained at the center. In addition to regular medical services, psychiatric and legal services, the center offers a summer camping program and an older brother-sister program. All services are free, voluntary and confidential.

One Example of a Drug Clinic

Although not always referred to as free clinics, drug-type clinics were included in the survey because of the many common goals and interests they share with free clinics, such as concern for young alienated members of society. Frequently, services offered by drug treatment centers include all those of the free clinics with the exception of general medical care and dental care. One such organization that is philosophically and organizationally very similar to the hippie-type free clinic is Do It Now Foundation in Hollywood. This is a national, educational foundation, supported through the sales of printed and other types of education material about drugs. The foundation in Hollywood has a medical director on call 24 hours a day and a medical advisory committee on research and treatment of drug-induced medical problems.

The staff of the center includes one physician in community medicine and 30 interns and resi-

dents from the University of Southern California Medical Center, two psychologists, five lay therapists, 15 paramedical personnel with extensive drug experience and six community volunteers. All services provided at the center relate to the use of drugs. General medical care for drug-related illnesses and emergency treatment for drug overdose is provided. Laboratory analysis of drugs, drug counseling and encounters, and detoxification are also provided at the center. The foundation is currently developing an outpatient methadone program. Other services include some types of health education, extensive drug education, paramedical training, legal services and suicide prevention.

Publications of the Foundation include pamphlets discussing the abuses of various kinds of drugs such as amphetamines, barbiturates, heroin, and speed; a cartoon publication developed especially for ages 8 through 12 as an effective approach to preventive drug education; and educational, peer-oriented record album with music by contemporary, well known musicians; and a special packet of educational material for teachers, counselors and administrators. The foundation also publishes a newspaper containing peer-group facts and news about drugs.

Coordination Can Prevent Wasted Energies

The primary goal of all free clinics is to provide patients with quality health care and related services. Since the movement began, however, clinics have had to face continual crisis situations in funding, staffing and community relations. With each clinic struggling to maintain its own existence, problems may also arise between clinics—such as competition for community support, geographic location and overlapping services. In 1970 the free clinics in Southern California developed a council of free clinics to aid in solving some of their shared problems. Of prime importance to the council was the preservation of each individual clinic's independence and individuality.

The Southern California Council of Free Clinics (SCCFC) consists of a board of directors composed of a representative from each of 22 member clinics and an advisory board whose function is to assist and advise the council in areas such as comprehensive health planning,

fund raising, public relations and legal affairs. SCCFC has received financial support from Regional Medical Programs Area V and the Economic and Youth Opportunities Agency of Greater Los Angeles.

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Relationships with Medical Societies

Among the goals of SCCFC is furthering the acceptability and cooperation of the medical and general communities. Survey respondents were asked whether they had sought the advice or assistance of their county medical society. Of the 45 respondents, 27 (60 percent) had done so. The types of assistance and cooperation free clinics would like the medical community to provide is reflected in their comments.

Three responding clinics have received some assistance or have been endorsed by their local medical societies. One, the Delta Health Project, is sponsored by the Sacramento County Medical Society. As mentioned above, Venice Community Family Health Center is partially funded by the local medical society. A spokesman for the Youth Service Center of Riverside stated, "We are proud to be endorsed by the Riverside County Medical Association and enjoy a good level of communication with their officers." Two other clinics reported that they have occasionally contacted local medical societies for referral purposes or for volunteer physicians or supplies.

The remaining 15 respondents who commented on this question indicated that medical societies are reluctant to support free clinic facilities. One respondent attributed this reluctance to a lack of knowledge or misconceptions of the extent of the problems and goals of the free clinics. The willingness of most free clinics to provide the California Medical Association with information concerning themselves suggests their desire to acquaint members of organized medicine with the problems and needs of the free clinic community. Their responses to the survey also seem to indicate that some free clinics are not merely willing to accept, but may actively welcome, assistance from the medical community as it is represented by county and state medical societies.

REFERENCE

1. Schwarz JL: Free health clinics: What are they? Health Rights News 4:3, Jan 1971

FROM THE MASSACHUSETTS DEPARTMENT

of

PUBLIC HEALTH

THE LEMUEL SHATTUCK HOSPITAL

The Massachusetts Department of Public Health has seven hospitals equipped for a broad range of clinical services, intended especially to meet the needs of patients with long-term but remediable disability. As a result of the increasing demand for health services in an expanding population, the seven hospitals have begun to assume a more direct role in serving the communities in which they are located. This includes preventive, therapeutic and rehabilitative services that are not always available.

Lemuel Shattuck Hospital in Jamaica Plain is the first Regional Vascular Center.

Cardiovascular Diseases

The Lemuel Shattuck Hospital was selected as the regional center because of its exceptional staff and its recently expanded facilities in angiography and in the diagnostic laboratory for thrombosis and vascular diseases. The new center is located in the Hospital's Vascular Laboratory, where work on the causes of thrombosis has been in progress since 1963.

The purpose of the new center is to upgrade the quality of care for vascular patients and to encourage the addition of vascular services in hospitals throughout the Bay State.

The new program coincides with recommendations made recently by the Inter-Society Commission for Heart Disease Resources calling for the establishment of regional vascular centers throughout the nation. The Commission, a creation of the Federal Regional Medical Programs Service, is charged with the development of guidelines for medical competence and medical facilities in the prevention, treatment and reha-

bilitation of those patients with cardiovascular diseases.

Guidelines for the improvement in diagnosis and treatment of vascular patients have already been stated by the Commission which define the delivery for optimal health care at three levels: the physician's office, the community hospital, and the regional vascular center.

Patients referred to the Shattuck will have access to highly developed diagnostic procedure and some forms of treatment not available elsewhere. Secondly, the goal of the center is to establish properly staffed vascular consultation services in the state and community hospital which will directly benefit many more patients

Chief Death Dealer

Much effort needs to be concentrated in this area since coronary and cerebral thrombosis, peripheral artery and vein thrombosis, and embolism together constitute the number one cause of death in the United States.

The establishment of vascular consultation services in hospitals at the community level would require the purchase of some equipment but more important is the concern on the part of medical staff to establish such services. The Shattuck Hospital is now ready to conduct courses that would help implement such programs in Massachusetts hospitals.

Glidden L. Brooks, MD, superintendent of the Shattuck Hospital, said that the expertise in thrombosis and vascular care at the new center can greatly improve the delivery of health care

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(Continued from Page 66)

rough this special program. He said that it is a good example of one state hospital in the State Public Health Department extending special competence to other state hospitals, community hospitals, nursing homes and to physicians in practice.

Expansion of other services into outpatient and home care programs is accelerating at the moment. The Hospital maintains an 18-bed detoxification unit for alcoholism rehabilitation. To obtain admission, a patient must be sponsored by an agency or an individual who offers a feasible follow-up treatment plan. The Lemuel Shattuck Hospital, working closely with the sponsor, provides detoxification, health and psychiatric evaluation, correction of most health problems, and makes recommendations for rehabilitation. The average hospital stay for patients is nine days. Individuals who seek admission should be in a problem phase of drinking at the time.

Home Dialysis

An additional program for the reversible complications of alcoholism is also underway. The hospital staff is particularly interested in patients with the clinical diagnosis of alcoholic hepatitis and who show hyperbilirubinemia greater than 5 mgm percent. These patients, who may or may not experience the complications of gastrointestinal bleeding, encephalopathy or azotemia, will receive intensive care from both medical and nursing personnel with a special interest in the management of alcoholic hepatitis problems.

Expansion

Special programs include the evaluation of therapeutic agents for control of gastrointestinal problems resulting from alcoholism. Patients suitable for these programs may continue in hospital treatment until liver function has been satisfactorily corrected. Investigators anticipate that the patients selected for study will require at least several weeks in the hospital.

The Lemuel Shattuck Hospital recently reopened a limited number of beds to be used exclusively for the care of patients with all forms of chronic pulmonary disease. Patients will be accepted if some benefit from therapy may be expected. The services offered include:

acute intensive care, long-term rehabilitation and physical medicine.

At the same time, the Outpatient Department has been expanded. There are now complete facilities for pulmonary function, x-ray, pathologic and bacteriologic studies. Patients sent for evaluation of pulmonary problems are returned to the referring physician unless he specifically requests treatment.

The Lemuel Shattuck Hospital also has a program for the care of patients with chronic renal failure, the first such program in a state public health hospital in the country. Patients who can benefit from chronic hemodialysis either in holding for transplantation or as a long-term prospect are accepted for training in home dialysis. About 60 patients are currently on the program. Artificial kidneys for home use are provided by either the Massachusetts Rehabilitation Commission or the Massachusetts Renal Disease Program.

These programs at the Lemuel Shattuck Hospital reflect the changes that are taking place in all the Department of Public Health Hospitals. The task of caring for the long-term patient and the multi-problem patient has traditionally fallen to these institutions. The turn toward the development of the Lemuel Shattuck Hospital, as well as the other public health hospitals, into comprehensive community resources represents the Department's responsiveness to the demands and needs of the citizens of the Commonwealth, and its intent to improve the quality of patient care in accordance with new concepts in the field of medicine.



Editor's Notebook

TO BE SUCCESSFUL, our organized system of health care must be based on cooperative teamwork, the lack of which has been the topic of discussion at many recent meetings of concerned professionals.

The consensus seems to be that health professionals must be trained as a team if they are to function as a team. At a recent meeting of the American Association of Dental Schools, Dr. Charles R. Jerge called for a consolidated master plan that would unify the efforts of the "many diverse institutions training people for the health field." He believes that because current health education programs are a "non-system" they produce "the non-system of health care that presently exists in this country."

With an apt analogy, Dr. J. Richard Gaintener, chief of staff at University-McCook Hospital, depicts Dr. Jerge's thoughts: "It's almost as if the New York Yankees were to train their pitchers in Arizona, their catchers in Florida, their infielders in Georgia, and their outfielders in Texas and then bring them all together in New York City and say, 'Okay, let's function as a team.'"

Possibly, schools of allied health professions can best provide a concept of teamwork for students. In these schools an opportunity for formal instruction in the "health care system" is available. Perhaps more importantly, students share common course work, use the same facilities, know the same instructors, are familiar with the same patients, and have the opportunity to informally discuss their experiences. In both ways, students gain a clearer understanding of the roles each plays in caring for the patient. Each can form a picture of the composite showing the function of his own area as well as overlapping areas.

A PROBLEM EXISTS in these schools of allied health, however. Dr. Joseph Hamburg, College of Allied Health Professions at the University of Kentucky, explains that "The development of a college of allied health has a tendency to separate programs from their sponsoring and supporting departments—medical technology from pathology; physical therapy from medicine, etc." This problem, he pointed out, concerns many who are involved in laboratory allied health training programs.

Dr. Hamburg described Kentucky's Medical Center as dedicated to collaborative effort (see RMP article, page 20). "The Colleges of Medicine and Dentistry, the major involved units, have given of their time, their staff, their space and their budgets in support of the College of Allied Health Professions." However, he thought it was impossible to deny a type of schism was created, although they have tried to minimize the fracture as much as possible.

"It may be that in other places where circumstances are not so favorable a coordinated approach to allied health education could be potentially disruptive," he emphasized. Schools should seek changing the climate, he urged, rather than disrupt the functional relationships among the allied health fields.

REGIONAL MEDICAL PROGRAMS (page 18) may help bring our health care system into a more cohesive unit. Programs such as RMPs in which health professionals must work together to establish goals, set priorities, and put projects in motion stimulate this sense of teamwork, helping cement relationships among the various specialities.

At continuing education course set up for allied health administrators and educators, the concept of teamwork is also projected. In one of these courses, the students emphasized that gaining an added appreciation of other allied health field was equally as important as the technical matter they had learned. Instead of perceiving only differences in their specialities, similarities were brought to the fore.

Margaret Howell

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Regional Medical Programs And The Technologist

● Medical technologists, seeing the success of their first efforts, are showing increasing interest in setting up more extensive projects in Regional Medical Programs.

"The character of medical care in the U.S. may be substantially changed through regionalization," stated Dr. Daniel L. Weiss, Professor of Pathology at the University of Kentucky College of Medicine, Lexington, at a recent College of American Pathologists' meeting on Regionalization of Medicine. With continuing stress on regionalization as a means of solving some of our nation's health care problems, M.T.'s knowledge and involvement are becoming more crucial. There are several areas where their RMP projects are beneficial: Area-wide continuing education institutes; expansion of training programs; systems for consultation and referral; and sharing specialized facilities.

Regionalization is proposed as one means of providing adequate health care for all. It is hoped that, through regionalization, underutilization of facilities and manpower will be reduced, and needless duplication of facilities will be prevented without sacrificing gains of sophisticated medicine.

The working relationships among university-affiliated medical centers, non-medical-school hospitals, and smaller, local hospitals form a type of regionalization, said Dr. William R. Willard, Special Assistant to the President for Health Affairs at the Kentucky university. The system operates when patients with difficult and complicated diagnostic and therapeutic problems are

referred from smaller hospitals to regional hospitals to university centers (depending on the individual problem). "This concept also calls for a flow of education, consultation and back-up services from the university through the chain," pointed out Dr. Willard.

A strengthening of this system is necessary on both an individual and institutional basis, symposium members agreed. "More knowledge and an expanding technology demand narrower fields of effort for each specialty in the health care system," Dr. Weiss explained. As fields become more limited in breadth, but deeper, all health personnel, general care institutions, and specialized facilities become more dependent upon each other.

This, interdependence is a key to a new, adequate, functioning health care system. One problem, Dr. Weiss said, is that, despite our familiarity with a type of regionalization, we have not yet come to grips with our interdependence. We still do not quite know how to deal with what lies ahead.

As explained by Dr. Herbert B. Pahl, Acting Deputy Director of the RMP Service, RMPs are a first step in formalizing an interdependent regional system. The initial concept of RMPs was to provide a vehicle by which new techniques, concepts, and systems could be transported to all health professionals. Through RMPs, plans are set up to meet health needs which cannot be filled by individual practitioners, health professionals, hospitals, or any institution working alone.

To accomplish these ends, RMPs learn of new techniques, provide

training programs, and coordinate facilities, manpower and other resources. One program in New York provides weekly educational conferences for technologists in over 50 participating hospitals (*Medical Lab*, Jan., 1971). In a cooperative project between New York Upstate Medical Center at Syracuse, and the New York RMP, audio-tapes with coordinated slides are made by the Upstate Medical Center and sent to area hospitals. Each institution can then set up their conference at their own convenience.

In addition to helping area hospitals improve their laboratory services, the program underlines the role of the University Medical Center as a consultant, referral institution. "Medical technologists throughout central New York contact us with any problems they encounter," points out Bettina G. Martin, coordinator of the Program.

In setting priorities, RMPs are deliberately designed to take into account local resources, patterns of practice and needs. Depending on the needs of a particular region, different kinds of programs have been developed.

For example, physicians practicing in small towns and isolated rural areas of Alabama have instant access to specialists at the University of Alabama at Birmingham through the Medical Information Service via Telephone (MIST). Calls can be placed free of charge from any point in Alabama, at any time on the MIST circuit, where switch-board operators are trained to locate specialists in all fields on split-second notice. The

project set up to investigate the comparative diagnostic efficacy of each of the insulin and arginine stimulation tests, it was found that 23 children out of a group of 60 fell into a range between the peak and diminished levels.

After administration of the stimulant, serum growth hormone levels of less than 3 or greater than 7 mmcg/ml are considered to be deficient and normal responses, respectively. Of the 23 unclassifiable children, some had hormone responses of more than 3 but less than 7 to both stimuli. A minimal increase following arginine infusion but a normal response to insulin administration resulted in several children. The rest gave a normal rise following arginine infusion, but no rise or a minimal one following insulin administration.

"It is important to point out that on the basis of a single test, some of these 23 children would have been classified as growth hormone deficient," points out Dr. Kaplan. "It is essential that at least 2 stimulation tests be used in the evaluation of children with growth retardation." In a few cases, she has found, precise diagnosis may be possible only when stimulation tests are performed after estrogen administration, or after observations of growth rate during a 6-month course of therapy of growth hormone administration.

It is believed that children with disparate or blunted responses probably represent a heterogeneous population with respect to growth hormone secretory capacity. The decreased responsiveness to both insulin-induced hypoglycemia and arginine infusion may reflect a diminished capacity of the pituitary to secrete growth hormone.

Discrepancies in the magnitude of growth hormone levels following these stimuli may represent an individual variation in sensitivity of the hypothalamus to these stimuli, supporting the concept that insulin-induced hypoglycemia and arginine stimulate growth hormone release through different hypothalamic receptors.

However, Dr. Kaplan warns, the significance of these disparate responses remains speculative since they do not simulate physiologic conditions. She also points out that a primary hypothalamic lesion, in which secretion of growth hormone releasing factor may be deficient, cannot be differentiated from a primary pituitary deficit through the use of stimulation tests alone.

Test conditions

At the clinic, test conditions are stringently regulated because so many factors may affect the release of growth hormone. Stress, exercise, sleep and some disease states such as thyroid disorders, diencephalic syndrome, acromegaly, and nutritional deficiencies may all influence test results.

In children with hypothyroidism, the growth hormone response to stimuli is often less than that observed in euthyroid children. The effect of hypothyroidism on growth hormone responsiveness is not related to the severity of the hypothyroidism, length of time before diagnosis, or the age of the child. Because of this, children with hypothyroidism are tested for growth hormone responsiveness following treatment with thyroid.

Treatment protocol

Children diagnosed as having a deficiency of growth hormone are treated with injections of growth

hormone extracted from pituitary glands. Patients receive 3 injections a week until they reach a height of 5 feet, or until puberty ensues. "Treatment is cut off at this arbitrary point because of the lack of hormone," Dr. Kaplan explains. "The shortage of growth hormone is so acute that some children must wait for treatment, often as long as a year." Five feet, she went on to say, is an unusual height for growth hormone deficient children. Untreated, they grow to be only 3½ to 4½ feet tall.

The therapeutic hormone is extracted from pituitary glands that have been donated to the National Pituitary Agency. A national organization has been set up to encourage donations of pituitary glands to the Agency. The Human Growth Foundation, as the organization is called, also funds basic and clinical research programs, and helps provide treatment for children from indigent families.

"And there is an educational aim, too," says Dr. Kaplan. "We want to make the public aware of the problems that can occur through hormone deficiencies and to let people know what is being done for youngsters with the problem.

"Research is providing more and more encouraging findings and new potential approaches for treatment of growth problems. We do not have all the answers by any means," she continued.

Another UCSF scientist, Dr. C. H. Li, has succeeded in determining the structure of growth hormone. Synthesis has also been accomplished. However, bulk production of the hormone is still too costly. Any possibilities of using it for routine treatment are still quite remote. □

Interdependence is the key to improving our health care system

program was developed through the cooperative efforts of the Alabama RMP, the University of Alabama at Birmingham, and the American Medical Association Education and Research Fund.

Generally, programs are related to 3 broad areas: Health care organization and systems, health professionals, and patient services and target groups. Virtually all RMPs list education or manpower as a major regional need, while disease prevention and early detection, health care for the poor, and urban health and rural health problems are close contenders for top priority.

Hospital participation is 1 key to development of RMPs. Building and strengthening effective working relationships among hospitals and medical centers are among primary concerns of the programs. Linking of less specialized health resources and facilities with more specialized

ones is a critical way to overcome the maldistribution of certain resources. Almost half the nearly 6000 short term hospitals in the country are now affiliated with RMPs; and about 60 percent of the nearly 500 medical-school-affiliated hospitals participate.

In rural areas, especially, regionalization can give valuable aid to M.T.s. Montana medical technologists formed a continuing education program with RMP help. There projects provide workshops on new techniques, particularly continuous flow analysis, (*Medical Lab*, April 1971). With no medical school center in their state, these technologists must provide their own sources of continuing education and consultation.

Rural areas, even those that have health care facilities, have an additional problem. Dr. Joseph Hamburg, College of Allied Health Professions at the University of

Kentucky, explored one of these situations during the CAP meeting. "Students who come from more rural or distant homes have a tendency to seek employment closer to our campus," he said.

As a solution to this problem, Dr. Hamburg proposes development of necessary programs within systems of community colleges. "Students who receive their education near their homes have more of a tendency to stay in that area," he said their survey studies showed. "In addition, as new systems of health delivery are generated and the most distant outposts become functioning satellites, there could be a tendency for health professionals to find such rural settings more appealing to them for work than some of the urban complexes.

"However," he observed, "it may be that, with our improving network of communication, even the most

continued on page 22

What Are Regional Medical Programs?

Fifty-six Regional Medical Programs now operate in the United States. They are the result of the 1964 Report of the President's Commission on Health Disease, Cancer and Stroke, which included development of regional complexes of medical facilities and resources among 35 other recommendations.

The first operational grants were approved by the National Advisory Council of Regional Medical Programs in 1967. Since then RMPs have been extended twice by Congress, most recently in 1970 for 3 years. Expanded provisions of the latter bill included emphasis on primary care and regionalization of health care resources; added emphasis on prevention and rehabilitation concepts.

To assure the RMP represents the entire geographical region, a Regional Advisory Group is required. Members include private practitioners, community hospitals, allied health personnel, and consumer representation. The primary function of the Regional Advisory Group is to determine overall scope, nature and direction of the program. Each Regional group must determine policies, establish criteria and priorities, allocate RMP grant funds accordingly, and review operational projects.

Most regions also have Local and Area Advisory Groups which assist in project development and implementation to meet community needs and to strengthen relationships among local in-

stitutions, organizations, and with the medical center.

Beyond Regional, Local and Area Advisory Groups, all regions have a number of task forces and committees which have major responsibilities for project development and/or review of projects. Nearly all of them assist in establishment of objectives and priorities for program activities.

Nearly 25,000 individuals representing both consumers and all facets of health provider organizations and interests are involved. They identify service needs, establish priorities at the local level, allocate and realign resources, and seek Federal and other funds to support activities and specific projects which are self-determined and self-operated. □

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RMP

continued from page 20

MEDICAL LAB
MIAMI, FLA.
MONTHLY CIRC. N. AVAIL.

MAR 1972

B.M.

rural student will be lured away from his home never to return."

He also noted that the RMP in the Kentucky area had been found to be relatively insensitive to allied health needs. Except for supporting several continuing education proposals, their interest in allied health has been concentrated on physician assistant programs. "The Regional Advisory Council still lacks representation from any allied health discipline," he reported.

His observations are echoed in the Allied Health Professions' national conference recommendation: Greater participation of allied health groups in the structure of RMPs. Support of allied health by RMPs, the association believes, is necessary to reach our mutual goal of comprehensive health care.

Opening Avenues to Health Care In a Rural Community

Two Atlanta Physicians Open Health Outpost for Underserved Rural Area

Many people feel that delivery of health care services in the nation's small, rural communities is one of the most significant and difficult issues waiting to be resolved by the medical profession.

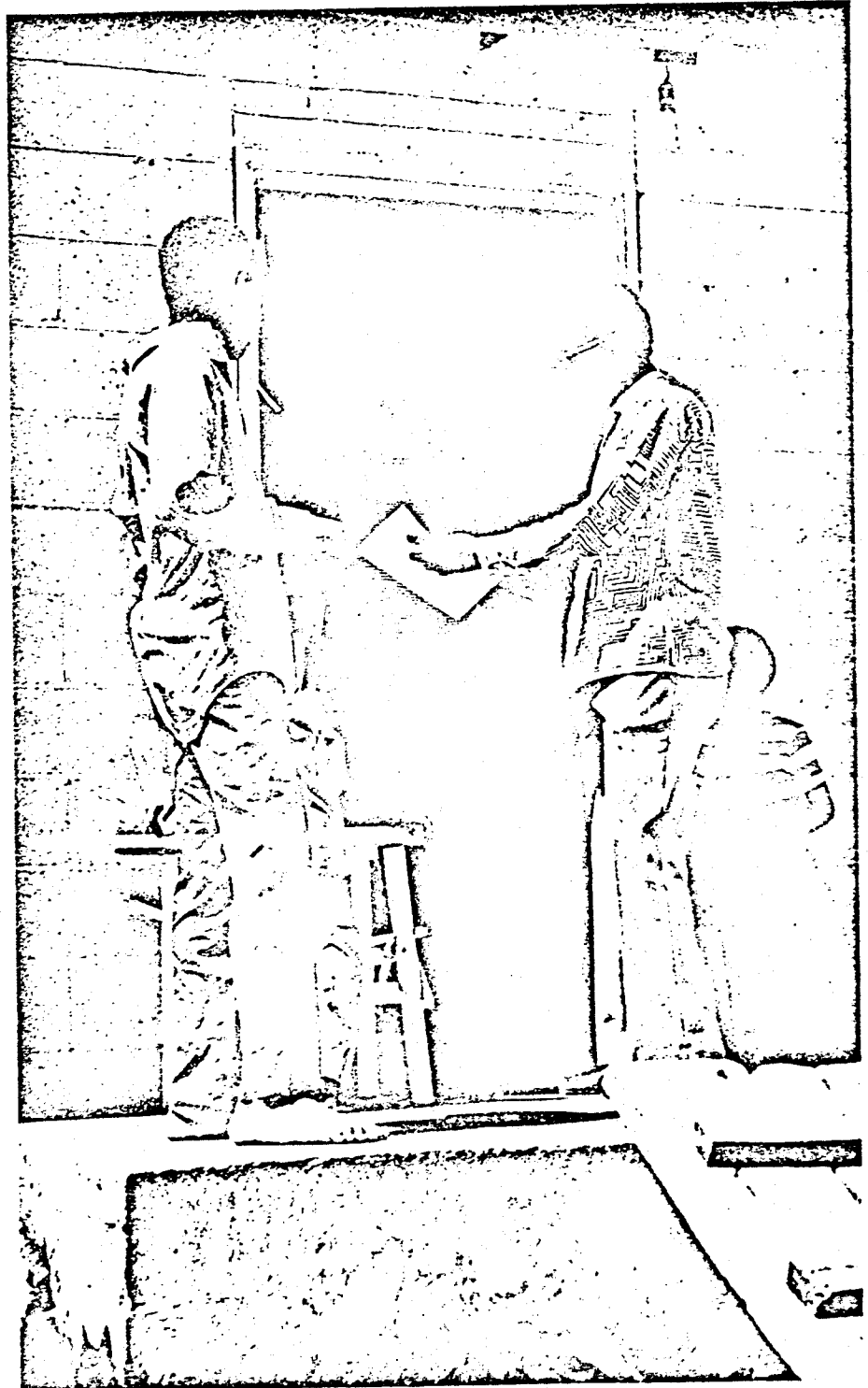
The concentration of health resources, manpower development and the focus of major developmental attention in the nation's urban areas has created a gap in rural health care delivery that leaves a sizeable segment of the population in our "country towns" often far worse-off than their big-city cousins.

It was this disparity that prompted Drs. Louis C. Brown and Calvin A. Brown of Atlanta to begin a project in McDonough, Georgia, which will give a large segment of the area's population its first measure of readily available health care services. If successful in its mission of health care work by a team of nurses, the project will be an important demonstration of how nurses and other formally trained health professionals can improve services in currently underserved areas.

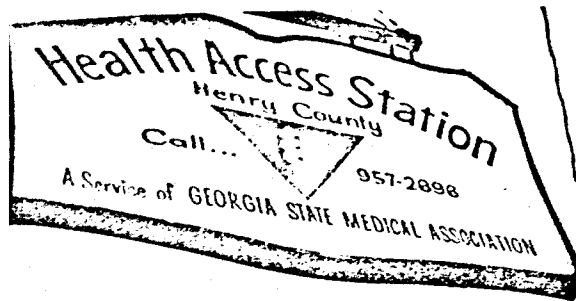
McDonough, Georgia, is located approximately 38 miles south of Atlanta, in Henry County, population 25,000. Henry County has a total of five physicians. Twice a week this number rises to seven. Those are the days Drs. Louis and Calvin Brown head down highway 75 on the 35-minute drive from Atlanta.

Their destination is the basement of a theater-turned-furniture-store located on one corner of the McDonough public square, where a sign at one side of the building indicates this as "The Henry County Health Care Access Station."

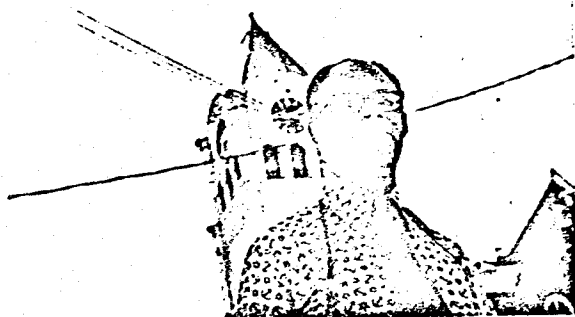
Until the station was set up last March, one public clinic was the only health care facility in Henry County. There are no hospitals and there is no ambulance service. The nearest hospital is in neighboring Spaulding County, but Henry and Spaulding Counties do not have a hospital service arrangement, and many people go to Atlanta when they become seriously ill.



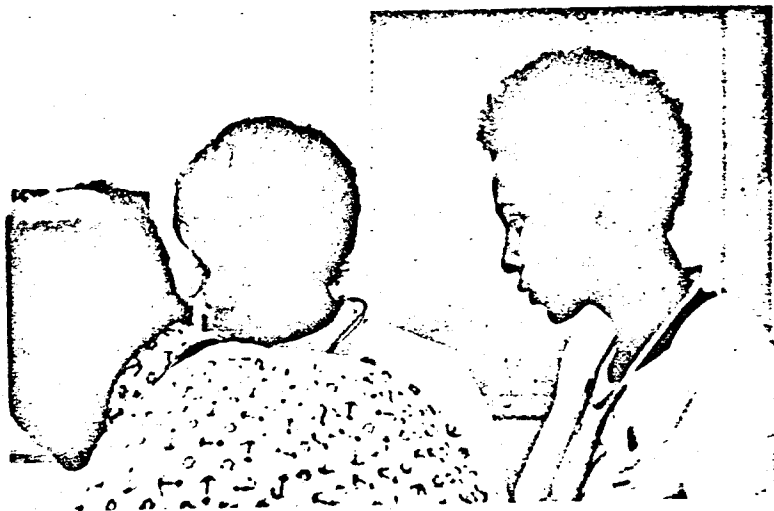
Shira Brown takes the message of a new and close-by health care service to the community, but educating people to come for health care when "they don't feel bad" has proven to be a difficult assignment.



Calvin A. Brown, M.D.:
"They don't even know
how to get on welfare."



Louis C. Brown, M.D.: "We are trying to open new avenues to health care for a population that has been by-passed by modern medicine."



Barbara Burroughs, R.N., and Virginia Nelson, L.P.N., watch as Dr. Louis Brown confers with a patient. Nurses have had special training in gathering medical history and counseling.

The significance of the Henry County Health Care Access Station is its role as a "new breed" of health care facility, reaching people in a grossly underserved community and providing health care services in a far-reaching experiment in which nurses play a major role in improving health care services. Beyond that is the crucial test of whether such a facility can obtain the 5-to-6,000 patient encounters annually which the physicians feel "will make it a significant factor in the health care of people in McDonough."

"What we are trying to do," says Dr. Louis Brown, "is to give the people of McDonough — mainly the poor — their first avenue into health care. Many adults here have seen a physician only two or three times in their lives. It's so difficult here to see a doctor, that if you have problems with transportation and money, you don't see a doctor until you are critically ill. The health care goal here right now, is to get people into the center so we help them get treatment for the tremendous backlogs of ills that they have been carrying around ... there's a lot of catching up to do around here."

In the few months since the center

the major medical problems encountered by the station are anemias, overweight and hypertension. "Most of the anemias seem to be nutritional," said Dr. Brown, "and we think the overweight problem may also be a function of diet. There is an excess of carbohydrates and a shortage of protein here. Worms and other intestinal infestations are not uncommon," he said, "and there is a lot of ignorance about health care."

Right now the doctors are looking to the time when the station achieves its patient load capacity of 40 to 50 patients daily. "And this brings in another point," says Dr. Calvin Brown, "and that is if the center has sufficient traffic, it might encourage some young physician to choose this area to set up his practice, and that in itself would be an accomplishment."

You have to understand that one of the major problems that anyone in a situation like this is going to be faced with is the difficulty in getting people to realize what the station is all about. Another difficulty is in getting them to come in periodically. Once we do that

people start talking about their own experiences at the station, I think we will move rapidly toward our patient encounter goal."

Shira Brown, who is administrator for the center, also handles the job of community outreach. "One of the major problems is just downright apathy," he says. "There hasn't been much done for the health care of these people in the past, and they are not going to form good health habits overnight. So what we have to do is go out into the community and spread the word that there is a health center close by where anyone can have his problems cared for with a minimum of difficulty. If we can get people interested in taking better care of themselves, we will feel that we have accomplished something," he continued.

But Shira Brown is not so optimistic that he sees these things happening without some other simultaneous changes. "Housing and economic conditions for some people here are in pretty bad shape. We need to see some changes in these areas that parallel work in health care. This project is also



Health care accessibility has been slow in coming to the people who live "beyond where the pavement ends," and on a rainy, stormy Saturday night, when the road is soft and slippery, it is best to not become critically ill.

Health Access Station Continued

attempting to help people here break out of the poverty cycle through better health care and through other avenues. We hope to work with other groups who have the experience and expertise to give a kind of social and economic dimension to what is now basically a health program." "Many of the poor people in parts of this area don't even know how to get welfare assistance," said Dr. Calvin Brown.

What kind of health care does the station provide? According to Dr. Louis Brown, the station is not attempting to compete with the few physicians in the area. "After all, the people we see seldom, if ever, go to a private physician. Actually, our nurses who run the program on a day-to-day basis have continuous contact with physicians in the area and can call on them whenever necessary, and they have continuous contact with Dr. Calvin Brown and myself.

We are not attempting to position ourselves as an emergency medical care facility, although we will, of course, provide emergency first aid. In fact, we have neither the kind of equipment nor the space to think we can solve all health care delivery problems in this area. What we are hoping to do is bring people into the health care system and provide, at the minimum, a level of health care which makes it possible for the poor people of this area to be in touch with medical help on a continuing

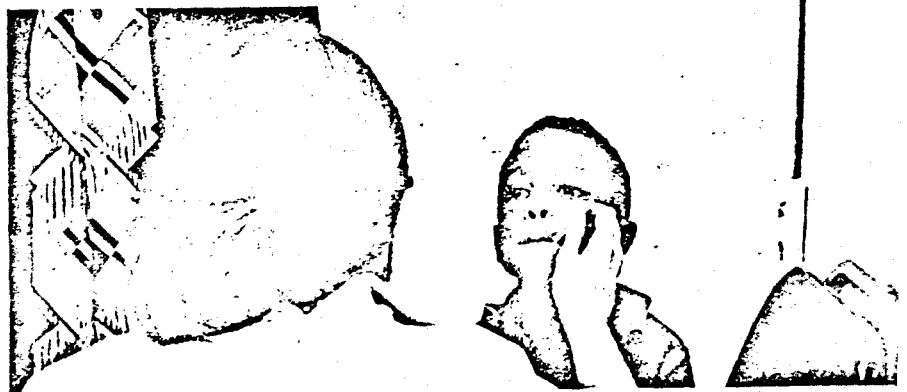
clinical screening — blood tests, urinalyses, blood pressure, diabetes screening and similar work.

"When a person comes to us for the first time, our nurses begin compiling a medical history and a medical evaluation. Where necessary, consultation with a physician is sought and standing treatment orders are given appropriate to the situation. In some cases we have found it necessary to transport an incoming patient immediately to the nearest physician or hospital. We have a vehicle for this purpose.

In addition to the mission of health care delivery, the doctors feel that the work of the station should include a patient education program and medical careers recruitment. "If we can get some people here motivated and involved, we hope that eventually they can be the ones running this center, and this in itself will be a significant accomplishment.



Nurse Barbara Burroughs and the staff of the Station provide patients with competent, understanding and dignified handling—technique which is winning the facility the friendship of the community.



New Sickle Cell Test Announced by Firm

A Philadelphia firm has developed an electronic device which it terms as "a practical advance in the screening of people on a mass basis for sickle cell disease."

The new instrument was introduced by Bio/Data Corporation and has been called by its designer, Bio/Data Vice President Michael Sokol, "the first piece of equipment available for low-cost mass screening."

Described as the "Sickle/Scan," the instrument was first demonstrated at Philadelphia's Mercy-Douglas Hospital. According to a statement from the manufacturer, the new instrument (1) reduces the positive recognition time from five minutes to less than one minute; (2) reduces the amount of reagent used by 85 percent; tests two samples simultaneously; (3) uses a blood sample drawn by a finger-stick (4) eliminates problems of sample identification, transportation and storage.

"In operation," the announcement reports, a 7 x 70mm test tube containing the blood sample/reagent mixture is inserted into one of the Sickle/Scan's two test wells. The instrument automatically begins its scanning process, measuring the rate of solubility of the negative blood sample in the reagent. The reaction is detected at its onset, giving a negative reading in ten to twenty seconds. If no reaction occurs within 60 seconds the instrument records a positive indication."

Since the machine is designed to screen out negatives, there is virtually no possibility of a positive being misread as a negative," the announcement said.

Howard Opens Cellular Biology Laboratory



A new research laboratory has been opened at the Howard University College of Medicine to conduct a wide range of studies in the field of cellular biology.

Named in honor of Ernest J. Just, the laboratory was developed as part of the College of Medicine's Department of Anatomy.

According to Dr. L. V. Leake, professor and chairman of the Department of Anatomy, the laboratory will be engaged in a number of research projects in "a wide range of problems to further our understanding of the total development and function of the human body."

Dr. Lee V. Leake, director of the Ernest Just Laboratory.

SPECIAL OCTOBER FEATURE

"The Nature of Community Health Centers"

An address to first-year residents of The University of Miami Medical School.

By George A. Simpson, M.D.
Director, Family Health Center
Miami, Florida

Therman Evans, M.D. To New Manpower Post

Therman Evans, M.D., has been named Special Assistant for Black Concerns in the Office of Health Manpower Opportunity, Bureau of Health Manpower Education.

The Office was recently established to strengthen the representation of disadvantaged people and minorities in the health professions. The Bureau, a component of HEW's National Institutes of Health, supports the training of physicians, dentists and other health professionals.



Johnny Johnson and Barry Ballen. Staff members provide nurses assistance and handle transportation for the station.

Continued from page 10.

Another major task which the station has assumed, Dr. Brown says, is that of being a "peoples advocate." "Nothing can be done of great significance here until housing, sanitation, water treatment and sewage problems are solved, and we want to keep contact with the proper officials to see that these needs are met."

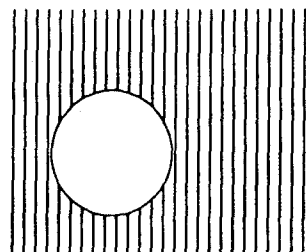
Recently, the station was removed from the Georgia Regional Medical Program's "temporary" funding list to a "permanent funding" category. Meanwhile, however, the two physicians are looking toward the day when the station is completely or mainly self-supporting. "Right now we are charging a small fee to see if the community will support the station financially. The

charges are minimal - \$1 for an office visit and \$2 for any type of injection.

Also in anticipation of community management, a community advisory council is being prepared to assume responsibility for operation and support of the station. "We are here to introduce people to health care," says Dr. Louis Brown, "to get them interested in running this station, and to help train them to operate it, and then we'll move on to another project."

Meanwhile, Shira Brown continues the routine of regular visits with people who live across the railroad tracks and down beyond where the pavement ends - an effort which brings success in small, but highly rewarding doses to the people receiving and delivering health care in this small, rural community.

regional medical programs



JAMES W. CULBERTSON, M.D.
CLAYTON BRADDOCK, M.A.T.

Memphis

MEMPHIS

The 75 county medical referral region served by the Memphis Regional Medical Program includes parts of five states. In seeking improved delivery of health care for this area, the Program has funded a variety of demonstration projects in urban and outlying areas.

Services of the Program staff emphasize planning for future needs, based on identification and definition of problems, and continuing education of health professionals.

The Memphis Regional Medical Program serves a 75 county medical referral region, including parts of western Tennessee, northern Mississippi, eastern Arkansas, southeastern Missouri, and southwestern Kentucky. The Program's two principal efforts are demonstration projects in urban and outlying areas and multidisciplinary professional staff services, including extensive planning to define and meet future problems arising from present conditions.

Demonstration Projects

Currently operating projects funded by the Program include the following.

A stroke center, incorporating disease treatment and prevention, research, communications and public education, and continuing education for physicians and other health care professionals in the Region.

A regional laboratory for gastrointestinal mucosal suction biopsy, serving as a referral facility for diagnosis of cancer and precancerous conditions and providing continuing education for physicians.

Two cardiovascular care projects, one in Memphis and one in a small town in northeastern Arkansas, demonstrating treatment procedures and serving as regional medical and paramedical educational centers.

A research project studying skin cancer and its epidemiology as an endemic condition in a rural area of western Tennessee.

Two multiphasic screening projects, one dealing with the poor, black urban population of Memphis and one dealing with the poor, white rural population in northern Mississippi.

A hospital-based home health care project in northeastern Arkansas, providing nursing, dietetic, and physical therapy services.



JAMES W. CULBERTSON

Dr. Culbertson is coordinator and director of the Memphis Regional Medical Program, with headquarters in Memphis.

CLAYTON BRADDOCK

Mr. Braddock is chief, section of information services, Memphis Regional Medical Program.



Multidisciplinary Services

To provide a wide variety of services and to permit a multidisciplinary approach to problems, the Program staff consists of persons from many professional backgrounds—medicine, nursing, rehabilitation, economics, education, medical social work, journalism and graphic arts, sociology, epidemiology, marketing, management, library science, physical therapy, nutrition and others.

Planning—Staff services include extensive planning to define and meet future problems in health care. Working with the Program staff to provide an organizational framework for these efforts are practicing physicians, faculty members of The University of Tennessee Medical College, and representatives from other segments of the regional community.

The Regional Advisory Group for the Memphis Regional Medical Program is the Mid-South Medical Center Council (MMCC), which is the comprehensive health-planning agency for a major part of the Region. The MMCC membership is composed of both providers and consumers of health care, with a predominance of the latter.

In planning, the Program operates on the premise that solving problems must begin by realistically identifying and defining them. For instance, physicians in Oxford and in Lafayette County, Mississippi, requested that the Program's staff conduct studies of medical practice and patients' needs to determine if all legitimate health care needs were being met and how better, more complete health care could be provided. Other examples are research into problems of delivering health care to the urban poor in Memphis and surveys of attitudes about planned parenthood among persons from all economic levels in Memphis and surrounding Shelby County.

One staff member has conducted a county-by-county survey of current health, education, welfare and recreation programs, facili-

A facility for diagnosis and treatment of emphysema and cor pulmonale, accepting referrals from throughout the Region and providing continuing education both locally and in outlying community hospitals.

A streptococcal disease center, providing services directed toward control of rheumatic fever and acute glomerulonephritis.

A regional referral center for peripheral vascular disease, offering consultative services, demonstration of rehabilitative methods, and special education.

A project in computer-aided electrocardiographic monitoring, with a view toward developing apparatus suitable for use in community hospitals.

A series of cardiovascular disease clinics throughout northern Mississippi, bringing cardiologists to county health departments for consultation and teaching.

A research project investigating hospital-acquired infections threatening patients with chronic diseases, directed toward improving presently available monitoring procedures.

ties and leaders in metropolitan Memphis, eastern Arkansas, southeastern Missouri, and southwestern Kentucky. Directories have been published for these areas and are planned for northwestern and southwestern Tennessee and northern Mississippi.

Continuing education—In addition to the sizable educational component in each of the demonstration projects, the Program plays a major role in continuing education through sponsorship of a continuing series of workshops, conferences, and in-service training sessions for nurses and members of allied health professions. The Program also provides staff consultation and assistance, as well as funding support, for workshops and conferences sponsored by such voluntary agencies as heart associations, nutrition councils, rehabilitation groups, and local branches of such organizations as the American Cancer Society, Inc., and the National Hemophilia Foundation.

Especially designed to help rural and small-town physicians is the Advanced Clinical Conference (ACC) program, in which small groups of physicians meet with consultants in local hospitals to grapple with problems selected by the physicians. After choosing the conference topic and date, the

physicians submit three to five case histories to the voluntary consultant in the designated specialty. The consultant prepares his response to the topic and to the individual case histories. Such conferences are informal but intense. The first-phase goal of reaching physicians in 20 mid-South towns has been accomplished ahead of predictions, many repeat sessions have been held, and many conferences are scheduled for the future.

The Program's regional library service often acts as an adjunct to the ACC program. In The University of Tennessee Library, the Program's three research librarians accept collect telephone calls from anywhere in the Region. They then provide a bibliography or photocopies of any material desired, usually within 24 hours.

Comment

Perhaps the most important functions of the Memphis Regional Medical Program have been to serve as a meeting ground for *all* members of the health care professions in the Region and as a focus for efforts to meet the needs of the unserved and underserved.

Office address: 1300 Medical Center Towers, 969 Madison Avenue, Memphis 38104.

MAR 1972 *Exhibit*

Grant Sparks Big Clinic Growth

Medical Group News

EAST LANSING, Mich.—Dramatic expansion of a community health care center in Pontiac has been assured with acceptance of a \$200,000 federal grant from the Michigan Association of Regional Medical Programs.

The award enables an increase in patients from the present 5,200 to a potential 25,000 a year at Lakeside Comprehensive Health Care Center, an ambulatory teaching facility operated by the Michigan State University College of Osteopathic Medicine. Lakeside Health Center opened 18 months ago in two converted two-bedroom apart-

ments of a development neighborhood housing nearly half of Pontiac's black population.

With the RMP grant, the center will triple its staff, and this month is moving to a building containing 10 times the space now available in the converted apartments. The building was recently purchased by the city of Pontiac, with the aid of a grant from the U.S. Department of Housing and Urban Development, to permit expansion of the clinic.

The new home will enable Lakeside to provide radiology services, dental care, clinical laboratory services, and help from

two fulltime social workers, two community health workers, a nutritionist, a health educator, a public health nurse, and additional nursing personnel.

Plans call for 12 treatment rooms and two large medical suites for daily specialty clinics. About an eighth of the center will be devoted to mental health services. Lakeside will continue to provide a clinical setting for training medical students.

"Medical students as members of the family health team at Lakeside are involved in a community program to help them learn what it really means economically, psychologically, and socially for a patient to be ill."

said Prof. James P. Howard, acting chairman in the department of family and community medicine at MSU, and executive director of Lakeside. "We know that low-income families often do not seek medical attention until an emergency arises, or until the baby is about to be born. This kind of care costs more and may be too late to help."

'Typical consumer' described

Survey in Colorado provides health data

The typical Colorado health consumer is in his late 20s, lives in an urban area, is white, and occupies a household with 2.1 other people.

He waits five days for appointments with his physician, 17 days for a dental appointment, can get to a doctor or a dentist in 30 minutes or less by car, and has relatively few complaints about health services in his area.

These are some of the possible generalizations that can be drawn from findings in the *Colorado Health Consumer Survey*, a 240-page volume compiled by the Colorado-Wyoming Regional Medical Program. The findings are based on interview and questionnaire responses from 2,913 Colorado residents who were canvassed during May and June of 1970.

CO-SPONSORED by the Colorado Office of Comprehensive Health Planning, the survey covers demographics, economics, manpower distribution, and consumer attitudes.

Findings are given for the state as a whole, and for each of the 12 regional planning areas mapped out in 1970 by the state planning office.

Viewed in terms of gross generalities, the study paints a comparatively bright picture of Colorado health services, but a close inspection of regional data betrays significant variations from statewide averages.

Statewide, for example, Colorado's 1970 health manpower ratio stood at about 150 physicians per 100,000 population. But most of the state's MDs and DOs were concentrated in and around Denver, causing moderate to critical manpower shortages in outlying regions (see map).

This uneven physician distribution appears directly related to many of the responses given by consumers who were surveyed (see chart).

Nine out of every 10 survey respondents said that they or someone in their family were covered by some kind of health insurance; and 31% of those with health insurance listed membership in more than one plan.

WHEN ASKED TO SPECIFY their coverage, however, only 75% of the households turned out to have hospitalization insurance; while 70% had surgical-medical insurance; less than half had major medical coverage; and only a fraction mentioned dental insurance.

The average yearly expenditure for health insurance was \$240 per household in 1969. About 45% of the households reported employer premium contributions in the \$100 range.

Nearly half of the families surveyed said they had incurred hospital costs during 1969. The average total was \$520, of which \$285 was covered by health insurance. For every five families with hospital bills, one was completely covered by insurance, and one was completely unprotected. The largest single hospital expense was \$70,000, reported by a household in Region 3.

About four families in 10 mentioned surgical costs in 1969. The average total was \$130, of which \$56 was picked up by health insurance.

Nearly 70% of the households listed physician costs for 1969. The average total was \$230 per household, and in-

insurance paid \$53. Only one family in 20 was completely covered by insurance.

ABOUT SIX HOUSEHOLDS in 10 reported dental bills during the year prior to the survey. The family average totaled \$130. The impact of insurance was negligible on the statewide sample, with only one family in 200 reporting 100% third-party payment.

When asked if they were satisfied with the medical care they'd been receiving, 64% of those responding to the question answered with an unqualified "yes." Another 9% indicated partial satisfaction; and 27% answered "no."

Urban areas produced the highest satisfaction rates, while the opposite was true in predominantly rural areas. Negative responses topped 35% in Regions 1, 8, 9, 10, and 11. Region 9 led the grumbling with a 44% negative

Most frequently mentioned complaints were high costs, long waiting times for appointments, impersonal medical care, shortage of specialists, and excessively long travel times to reach health care facilities—in that order. About 20% of the complaining households had multiple gripes.

"MEDICAL CARE is too expensive"

was the most frequently checked complaint in eight of the state's 12 regions and it ran second in the remaining four. Cost complaints were most numerous in urban areas.

"Must travel too far to receive medical care" led the protest list in Region 9, where one family in four lives more than an hour from the nearest physician's office, hospital or hospital emergency room. Lengthy travel was hardly mentioned at all in Regions 2, 3, or 4.

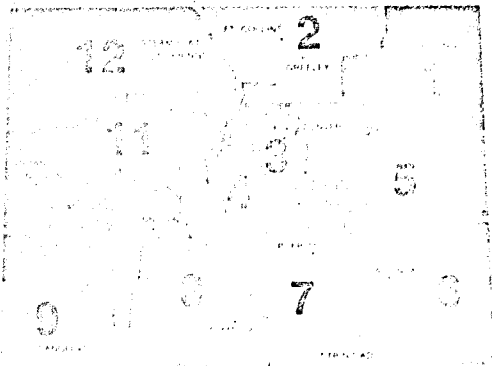
"Have to wait too long for appointments" was far and away the most frequently checked complaint in Region 5 where families claimed they wait an average of 12 days to see a doctor, almost a month to see a dentist. Long waiting times also topped the complaint list in Region 7 and—oddly enough—in Region 8, where survey-takers found below-average waits for medical appointments.

ON THE SUBJECT of manpower at facilities, almost six families in 10 saw a need for more general practitioner while one family in four stressed the

importance of more inpatient hospital facilities and more dentists.

On the basis of findings in the study survey-takers judged only six of the state's 12 planning regions to be "well defined service regions with a potential or existing regional health service center."

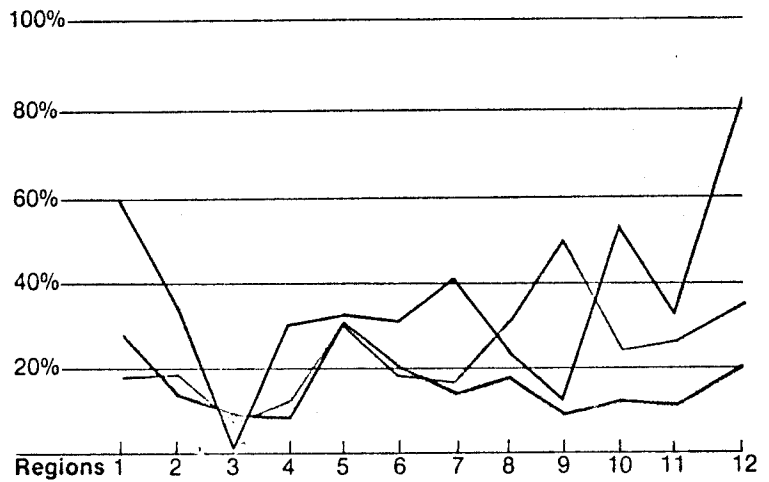
Regions and physician density



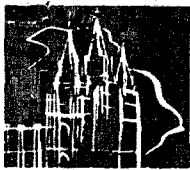
1970 Colorado MDs and DOs per 100,000 people

- 60-70 □ 91-100 □ 131-140
- 71-80 □ 101-110 □ Over 350
- Under 40

Responses by region



- Excluding Denver, families who must leave region or state to reach "secondary" physician or specialist (465 responses)
- Households reporting regular use of chiropractic services (2,913 responses)
- Households located 30 minutes or more from a physician's office (2,897 responses)
- Adult females reporting they've never had a Pap smear (2,734 responses)



UTAH

Intermountain Regional Medical Program's Diabetes Center

What's a person to do? Recently diagnosed as having diabetes mellitus, the new diabetic is at best inadequately informed and unadjusted. He is told his disease is manageable and that he carries a major amount of medical responsibility in maintaining and regulating his health. While in the hospital the new diabetic's physician directs nursing and dietary personnel to make information concerning diabetes self-care available to the patient. The diabetic is instructed in insulin administration and urine testing. His physician is able to give him limited instruction and encouragement.

With this introduction and orientation about his disease, the diabetic is charged with his own urine testing, injecting his own insulin, regulating his activity, choosing his diet, and even altering his insulin dosage on occasion. He must act as his own laboratory technician, nurse, dietitian, and even to a great extent, physician. Finding and taking time to assist 40,000 Utah diabetics (there are more than three million known diabetics in the United States), and in most cases their families, in adjusting to a new life style are the medical profession's major obstacles in achieving adequate diabetic self-care. Properly controlling the seventh leading cause of U.S. deaths requires time, patience, a great deal of repetitious effort, and a close patient-physician relationship which must be fostered by mutual understanding and cooperation.

A 1970 University of Utah Medical School study of the extent to which hospitalized diabetics were being educated in Salt Lake County hospitals showed "only about 50 per cent of these diabetics receive more than a token amount of teaching". Regional and national studies conclude that long-time diabetics have only a limited understanding of their disease and that with greater understanding, problems of reactions and acidosis could be avoided.

Aware of the situation because of their professional interest, knowledge, skill, and their participation in and coordination of an annual Utah diabetic summer camp, University of Utah College of Medicine assistant professors Dana Clarke, MD; Marvin J. Rallison, MD; and Mrs. Barbara Prater, MS, assistant professor at the University of Utah College of Nursing, began seeking solutions. After investigating local, state, and regional diabetes education programs it was found that the quality and quantity of instruction varied greatly. In most hospitals, where there are no organized programs, the nurses' and doctors' teaching time was at the mercy of many required tasks in the daily routine.

If the nurse or doctor had a busy day with other sick patients, no teaching occurred. Even if a patient attended organized programs at LDS or Primary Children's Hospitals, it was doubtful whether the five hours of instruction were sufficient. They agreed with the conclusion of the 1970 local study: "It is evident that the individual, ad lib teaching is, at best, mediocre." 12

Dr. Clark, Dr. Rallison; and Mrs. Prater, working in conjunction with the Intermountain Regional Medical Program (IRMP), formulated a program to meet the Utah need. The proposed project was submitted for approval November 1, 1970, and was funded by the IRMP April 1, 1971. The program is similar to and based on an existing regional center for diabetic and medical personnel education established in Minneapolis, Minnesota, in 1967. The objectives of the Utah project are the same as those of the Minnesota center: (1) to provide the practicing physician with a new resource center that can assist him in the management of his diabetic patients; (2) to improve the health of diabetic patients by stimulating their interest in and knowledge of their disease and its management; (3) to establish an educational center where nurses, dietitians, and physicians can obtain comprehensive training in the management of diabetic patients; and (4) to assist physicians in the early identification of the diabetic and to educate the general population in regard to the nature and prevalence of the disease.

Located in Salt Lake City at 1002 East South Temple Street, the Diabetes Center opened its doors February 7, 1972. The remodeled third floor east wing of the Holy Cross School of Nursing Building houses the Center. The facility will not only offer classes and information to diabetics and their families but will provide a unique five-day living-in experience for participants. While at the Center personalized self-management instruction and counseling will be given by a team of University of Utah physicians, nurses, and dietitians.

Patient classes will be conducted at the Center on a scheduled basis, with enrollment limited to twelve patients and one member from each of their families. Patients and family members will reside at the facility during the five-day course. The small patient number permits significant individualization in teaching and allows adaptation of a diabetic management program to the individual patient needs rather than altering the patient's way of life to a rigid, uncompromising therapeutic schedule.

The Center's services will be available to newly discovered diabetics as well as established diabetics whose knowledge of their disease is incomplete or whose self-care and management are a problem. The program will be open to all diabetics in the Intermountain Region (juvenile onset, adult onset, insulin requiring, non-insulin requiring, labile, stable, mild or severe). But all patients must be referred by their private physicians or primary care facilities.

During his stay at the education center, the patient will undergo thorough re-evaluations including a general physical exam, an assessment of the late manifestations of diabetes, an evaluation of his social situation, educational background and intelligence, and an evaluation of the level of "control" of the disease. Throughout the course, each patient will test his urine, have indicated blood sugars drawn, select foods from liberal cafeteria assortment, discuss food selections with health professionals, be involved with adjustments in both insulin dosage and dietary regimen, have available recreational and exercise facilities, partake in discussions with other diabetics and Center personnel, and function in the usual activities of daily living and self-care. At the end of the course the patient will be referred back to his physician with an evaluation of his progress and a summary of his accomplishments.

The Center will also facilitate an education program for allied health personnel. A five-day course designed and directed to further the training of nurses, dietitians, nutritionists, and others who are involved in the care of diabetic patients will be available. The curriculum is designed to convey the most current knowledge and teaching technics to those concerned with diabetic instruction.

It is hoped that this training will help by both strengthening existing hospital diabetic teaching programs and by facilitating the establishment of other training programs in the Intermountain Region. The Diabetes Center, a first for the nation as well as Utah and the Intermountain Region, offers a service and is a primary resource for the physician and diabetic patient.



WYOMING

Dr. Treloar Lauded for Years of Medical Service

Dr. O. L. Treloar of Afton, Wyoming retired February 1 after 42 years of practicing medicine in Afton. Since he started practice in Star Valley in 1929, he has delivered more than 3,200 babies.

The 70-year-old general practitioner set up his office on Afton's Main Street in 1929 and a few years later established the Valley General Hospital where he practiced with the late Dr. S. H. Worthen and later with Dr. O. D. Perkes. When Dr. Worthen was drafted into the U. S. Army at the outset of World War II, Dr. Treloar provided all medical care for the entire valley for four years. In 1944, he delivered a record 181 babies, an average of one every other day.

When Dr. Treloar announced his retirement, Afton's weekly newspaper, the *Star Valley Inde-*

pendent, paid him tribute. The newspaper's December 30, 1971 editorial noted, "Thousands have benefitted from his medical and surgical skills through the years. He, and our other local doctors, have always carried a heavy load of work, making many and great sacrifices in their personal lives. Their efforts have resulted in saving hundreds of lives, as they have used their skills unselfishly.

"The magnitude of gratitude felt by the people of the valley was expressed on November 21, 1969, when 490 persons turned out to honor Doctor Treloar at a special appreciation dinner to mark the 40th anniversary of his medical practice. The highlights of his medical career, as well as his civic contributions, were reviewed and many fine tributes were paid to the doctor and his good wife."

Dr. Treloar, who has limited his practice since 1955 because of ill health, has been extremely active in Afton civic affairs. "He has always been an energetic and vigorous leader in pressing for progress and improvement."

Wyoming Member A Guest Lecturer

Loran B. Morgan, MD, a Torrington, Wyoming ophthalmologist was recently a guest faculty member at the University of California Medical School. He lectured in a short course entitled, "Recent Advances in Ophthalmology", where he presented two formal papers, one of which concerned the origin and uses of the Morgan Therapeutic Lens, which he recently developed.



NEW MEXICO

Dean of School of Medicine Presented Award

Robert S. Stone, MD, dean of the University of New Mexico School of Medicine was presented the First Annual New Mexico "Citizen of the Year" Award by the Albuquerque Board of Realtors on January 20. In citing Dr. Stone for his achievements, Mr. Jack Elliott, president of the Board, said that through Dr. Stone's efforts "New Mexico is expected to develop into a major world center for research and treatment of cancer. Recognizing the scientific impact of the Los Alamos Meson Physics Facility, Dr. Stone organized the scientists in the western region to supply this new scientific tool to alleviate suffering in cancer victims. He is responsible for development of a Regional Cancer Research Center at the University, a facility necessary in providing a logistical base for treatment of cancer patients."

A native of New York City, Dr. Stone has compiled an outstanding record in contributions to

this is the life-saving network

**making emergency
medical information
and taped education
immediately available
to all parts of
the state**

At 4:55 p.m. on Friday. The teletype in the Arizona medical Center library at the University of Arizona started rattling. The field librarian for the Arizona Medical Library Network checked it. A doctor in Flagstaff needed information fast.

He had a patient who had attempted suicide with a drug overdose. The patient was in a coma. It was an emergency that he normally could have handled with little assistance, but in this case the drug ingested was one that rarely turned up in suicides. No one could be found with any knowledge of either this particular type of poisoning or what kind of therapy to use.

No wonder. The field librarian immediately spotted the literature and found that only six cases had been recorded throughout the world. Other library staff members started a more intensive search. Books and medical journals were scanned for any information that would help. Minutes sped by. Finally, in an obscure journal, a way of managing the problem was located.

It was 5:30 p.m., less than an hour later, when the librarian called the doctor through the special network hookup. He outlined the recommended therapy and then quickly listed the other articles available on the subject. Did the doctor want copies? Yes, and quickly.

Using the regimen given him by the librarian, the doctor was able to arrest the poison which was rapidly spreading in the patient's system. The patient began to respond. Soon the promised literature arrived through the local relay station of the library network at Northern Arizona University. Using the added information, the doctor and the

hospital team started special treatment. In a few days the crisis had passed.

Being able to quickly get hold of specialized medical information is a new experience for some Arizona physicians, particularly those in rural areas. The Arizona Medical Library Network was put together by the Arizona Regional Medical Program, an organization that seeks ways to improve health care in the region.

The network consists of five major libraries serving as relay stations to transmit requests from anywhere in the state to six "resource" libraries where information may be found. The system uses teletype and telephone so that a practitioner in the remotest location can tap into the system quickly. In its first six months of operation more than 1,200 requests for literature were received from all over Arizona and more than 25,000 copies were sent out on almost every conceivable malady.

A doctor in Bisbee calls the network relay station at nearby Cochise College and asks for a journal article. The relay station scans the network and finds the resource medical library at St. Joseph's Hospital in Phoenix has the article. Cochise College sends a teletype request for the article to the Maricopa County Medical Society in Phoenix, another relay station, which in turn telephones St. Joseph's. Within 24 hours, St. Joseph's mails a free photocopy to the doctor in Bisbee. If he had needed a book instead of an article, the entire volume would have been sent, to be returned later.

"The Network is certainly no substitute for the good practice of medicine," Dr. D. W. Melick, Arizona Regional Medical Program Coordinator, said, "but it's a tremendous aid. In the old days, when a doctor in a small town had a patient with a particularly obscure medical problem, often the only answer was to pack the patient off to Phoenix or Tucson where the sophisticated medical centers are. It wasn't that the doctor lacked capability. He was just handicapped by not having a medical reference library at hand or access to specialized consultation. Now, with the network, more patients can stay at home and more doctors can do a better job because they have the same resources available as do their big city colleagues."



PAUL MILLER

Arizona Western College at Yuma is a relay station for doctors' requests and the libraries' replies.

**'more
doctors can
do a
better job'**



Dr. D. W. Melick said, "Often the only answer was to pack the patient off to Phoenix or Tucson."

Dr. R. H. Angell, chief medical officer for the Indian Health Service at Kayenta on the Navajo Reservation, said, "I am most enthusiastic about the reference services. We were treating a patient with the Richardson-Olsewski-Steele syndrome and it was a simple matter to call the Flagstaff office and in a reasonably short time copies of six recent articles on this unusual problem were sent to us. Excellent articles on some of our more common problems such as malnutrition, alcoholism and infant diarrhea have also been collected and sent to us."

Getting information into the hands of those who need it is one of two basic functions of the network. The other is helping local hospitals with their medical reference needs. This is done through a variation on the old-time circuit-riding judge, except in this case, it is a circuit-riding librarian.

Once a year each of Arizona's 80-plus hospitals is visited by a field librarian from the University Medical Center in Tucson. The field librarian advises how to use the network and how to make the best use of what is available locally. This hasn't always been easy. In one report he noted that "the hospital administrator was new in the job and was quite suspicious of me at first. He thought I was a traveling salesman. In fact, after my initial description of the library network, he asked me 'How much does all of this cost?' So I explained that it was for free and he relaxed."

The field librarian travels more than 3,000 miles a year. Book loan figures show that demand in-

riably increases following field consultation. In many places the librarian has been able to steer people to local resources that they didn't know they had.

Another resource for keeping up-to-date is the telephone, due to a spin-off of the network called "Dial-A-Tape." Melick said, "Out here distances tend to reduce conventional opportunities for learning about new developments, such as attending educational programs at the major metropolitan medical centers. So we weren't too surprised to find that the library network was being used not only as a reference tool for specific cases, but as a means of educational updating as well. This led us to wonder about other ways to quickly disseminate the latest information on research results and clinical methods. The Wisconsin Regional Medical Program had had some success with a system they called Dial-A-Tape, so we decided to try it in Arizona."

Dial-A-Tape is essentially a taped medical reference library. Also located at the Medical Center Library, it consists of two rotary telephone lines, two cartridge tape players and a library of more than 300 cartridge tapes. Each tape is recorded by an expert in each subject and all that is needed to listen is a collect telephone call, for which the Regional Medical Program picks up the tab. Dial-A-Tape is available 24 hours, seven days a week for doctors and nurses.

Dial-A-Tape is used in emergency situations, as back-up consultation and mostly as a handy way to keep up with postgraduate education. "One doctor I know," Melick said, "uses it in a particularly inter-

**'We have
helped to
narrow the gap'**

a subject from his directory, calls Dial-A-Tape, and listens to it before going to sleep. At first I was suspicious that he was using it to PUT him to sleep, but he assures me that he sometimes gets so interested in what he hears that he has, on occasion, gotten up and made notes to contact the library network the next morning for more in-depth information."

While neither Dial-A-Tape nor the network supplant the more conventional ways of getting post-graduate education, they have become important educational elements in rural Arizona. In Kingman, for instance, Dial-A-Tape has become required listening for nurses at the Mohave General Hospital.

"Each person in nursing service is required to listen to at least one Dial-A-Tape program a month as part of continuing education," nursing in-service supervisor Robyn Bancroft said. "Each level of our nursing staff absorbs what they can from the program. Certain areas have been set aside in each area of nursing, instructions have been posted and a Dial-A-Tape directory is available."

Another community hospital was so taken with the system that five or six phones on a special switchboard connection were set aside so that several people could listen to the same tape at the same time.

What have the library network and Dial-A-Tape really accomplished in Arizona? Melick said, "We hear a lot today about the uneven availability of quality medical care. Part of the problem in Arizona is bridging the time and distance gap between where knowledge is and where it is needed. We have, I think, helped to narrow the gap with these systems."

The Health Service doctor at Kayenta said the network and Dial-A-Tape are "invaluable services. They help us to improve our medical care and they serve as a welcome tonic for a sometimes oppressive feeling of medical isolation." □



An operator in Tucson prepares to play a tape for a caller in rural Arizona.



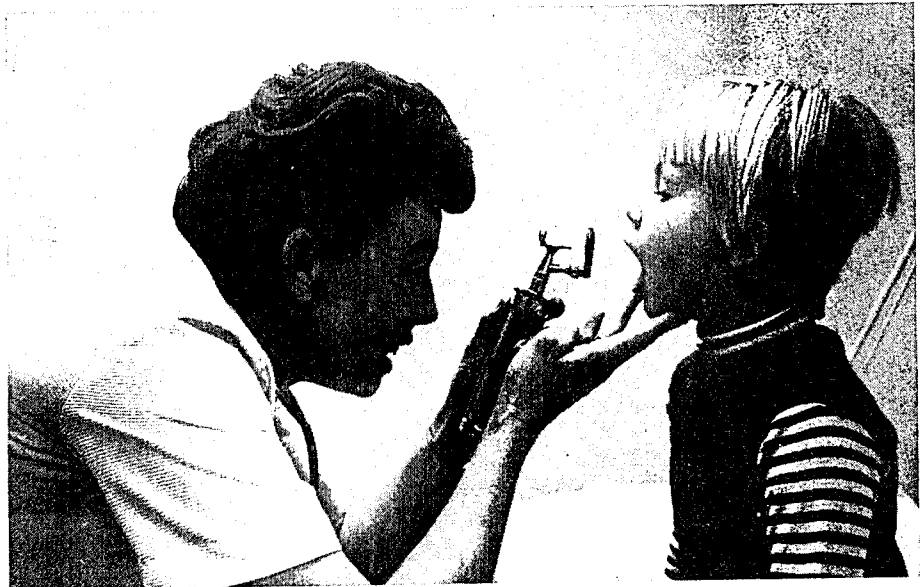
The Cambridge-Council Concept Or Two Nurse Practitioners Make Good

Council, Idaho, had two physicians, Cambridge, Idaho, none—not enough for both if they practiced in the traditional way. The Mountain States Regional Medical Program helped to demonstrate to each community that these physicians' skills could be used more effectively, and health care greatly expanded in this 100-mile area by giving one specially prepared nurse in each town the opportunity to really practice what she knew.

JOHN A. EDWARDS / JANE CURTIS / KAY ORTMAN / PHOEBE LINDSEY



Patient John Williams and Nurse Practitioner Curtis exchange warm greetings on Council's main street.



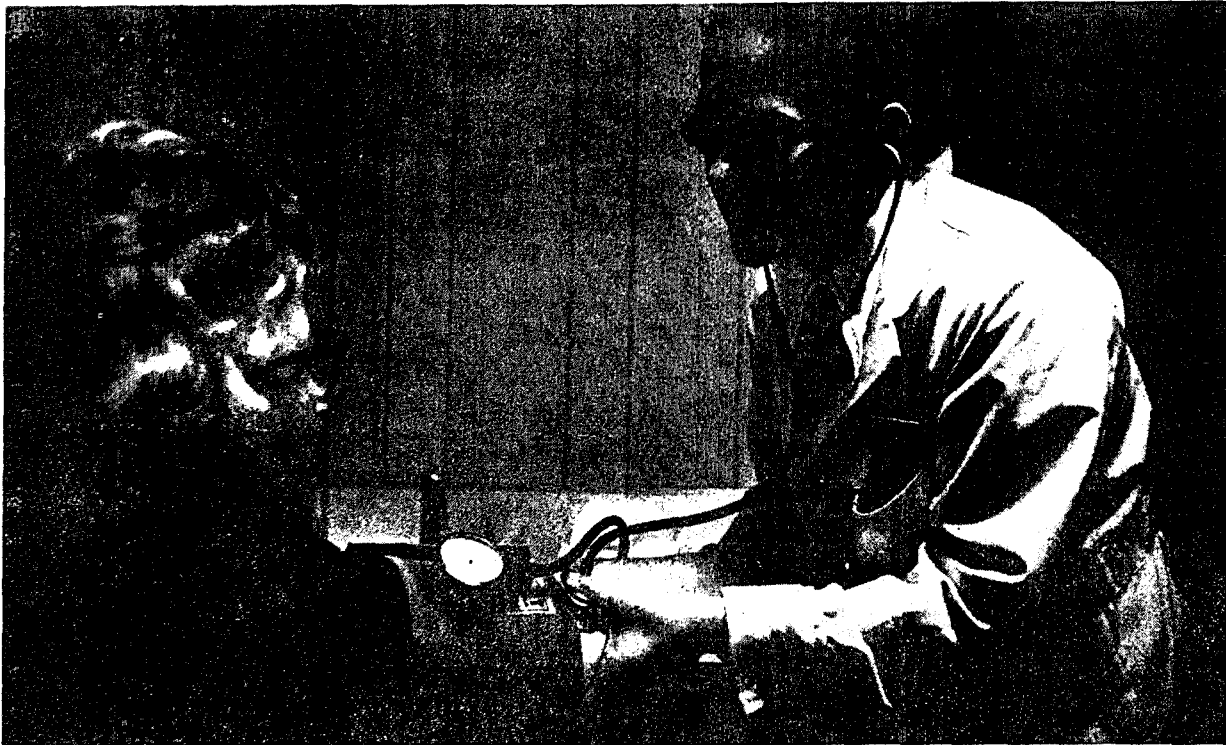
At the Council clinic, Nurse Practitioner Jane Curtis screens patients, treating some herself, referring others to physicians with whom she works.

The hand-lettered sign on the door reads, "Office hours 9-5 Mon.-Fri." and the waiting room in the former pool hall is starting to fill when Nurse Practitioner Kay Ortmann begins to see her patients. This now usual and accepted occurrence in Cambridge, a rural farming community of 383 persons in west central Idaho, would not have been conceivable or even probable in any Idaho town a year earlier.

A winding, hilly 22 miles away,

in not-much-larger Council, Nurse Practitioner Jane Curtis begins to screen patients coming to that clinic. In contrast to her Cambridge colleague, she has close at hand the physicians with whom both work. Still, she will refer only some of the patients to them. Others she will deal with by herself.

These two specially trained nurse practitioners represent major changes in how health care is given in the Cambridge-Council area.



In the Cambridge clinic, Nurse Practitioner Kay Ortman sees patients alone except for two afternoons a week when one of the physicians travels from Council to see patients.

They are the essential elements in a project sponsored by the Mountain States Regional Medical Program.

The Need

The State of Idaho encompasses some 83,000 square miles of ruggedly beautiful terrain with a population of 698,000 people clustered in small urban-rural centers along the rivers and valleys of the state. As in most of the nation, most of its health professionals—approximately 90 percent—tend to locate in urban areas. Many small communities and 5 counties have no resident physicians at all.

Two family practice physicians who live in Council (pop. 900), serve a total population of 6,000 dispersed over a 100-mile radius, including Cambridge. During twenty-four years of practice, the senior physician lost five colleagues to the conveniences of urban practice and living. There are few physicians willing to take on the 24-hour day, 365 day-per-year responsibility faced by the rural practitioner. The last resident physician in Cambridge died five years ago. Efforts to replace

him were futile despite the community's activities to raise funds for a new clinic facility, as a special attraction. Increasingly, it became apparent that new ways of extending medical services would be the solution to the area's health care problems. The Mountain States RMP set out to demonstrate how, through the use of nurse practitioners.

One of the first steps was a "town meeting" of physicians and nurses from the area, including the nurses on the 20-bed Council hospital staff, and others concerned with the program. Although there were some reservations about the scope and outcome of such a nurse-practitioner project, the group expressed a willingness to permit a well-controlled one to take place.

Stanford University Medical Center, in cooperation with Area III of the California RMP, was launching a special program to prepare nurse practitioners for just such needs, and agreed to accept two Idaho nurses in its first class of five. The two Council physicians agreed to employ the nurses and to help with

their continued education after they completed the course, and the project director of the Stanford program proceeded to select the two nurses.

The Stanford program was ideal—short enough (four months) to make it possible for the nurses to be away, and flexible in its prerequisites. The two nurses who entered the program are of varying backgrounds. Jane Curtis is a graduate of a 3-year hospital school of nursing with 20 years' experience, including four years as director of nursing service at the Council Hospital. Kay Ortman is a fairly recent graduate of a baccalaureate program with experience as a staff nurse in a 500-bed urban hospital, as well as nine months at the community hospital in Council. When the project began, she was counseling in a satellite mental health center in Cambridge.

Their training program, which started October 1, 1970, was intensive and concentrated for the first three months with clinical experience at the Stanford Medical Center and nearby clinics. The fourth month was spent working in rural

Although the training period was essentially the same for both practitioners, each has developed a unique position on the health care team in her community.

clinics, in California, with family physicians. Content and experience were geared primarily to acquiring additional skills ordinarily perceived as medical with the assumption that the nursing background provided a sound basis on which to build. These included taking and recording histories; giving complete physical examinations (including neurologic and pelvic with Pap smears); suturing minor lacerations not involving tendons or nerves; managing chronic disease problems; managing geriatric patients; treating common infections or self-limiting illnesses; performing and interpreting laboratory screening tests, such as C.B.C. and differential, Hgb., urinalysis, sed.

JOHN EDWARDS, M.D., is the senior physician and a member of the House of Representatives and a member of the Health and Welfare Committee in the Idaho legislature. Aside from membership in his professional organizations, he is active in state and local health planning groups and chairman of the Idaho board of health council on mental retardation. A graduate of the George Washington University School of Medicine, Washington, D.C., he has been a general practitioner in Council, Idaho, for 25 years.

JANE A. CURTIS, who now signs her name "R.N., N.P.," graduated from St. Joseph's School of Nursing in Lewiston, Idaho, in 1952. She was serving as director of nursing of Council's community hospital when she was selected to be the nurse practitioner who would serve the Council area. She is deeply impressed by the ease with which she has been accepted in her new role not only by patients but by colleagues, as well as by the great interest others in the state show in her work. She believes there is a great future for herself and others in this role.

KAY ELIZABETH ORTMAN received her B.S. in nursing at Michigan State University in 1968. She worked briefly as a staff nurse in Ohio, then in Council's hospital until she was appointed mental health consultant in Cambridge. As the nurse practitioner in Cambridge, she not only fulfils some of the traditional family physician functions, but also assists the local public health nurse in providing community services. "Three years ago" she says, "I was quite frustrated at the lack of continuity of patient care. Today, I am actually helping to change that. I am really doing something to fill the gaps in health care."

PHOEBE A. LINDSEY has been staff assistant in the Idaho office of the Mountain States Regional Medical Program in Boise since 1970, and has worked on several of their projects. She is a graduate of the Boise State College, where she worked in the registrar's office while earning her A.B. degree.

rates; normal deliveries; giving well-child care; and giving routine prenatal and postnatal care.

A three-month, six-month and one-year evaluation by the project director in the home setting would be an integral portion of the program. No tuition was required. Travel and living expenses were paid by Mountain States Regional Medical Program.

Preparing the Community

Sustained involvement and information sharing not only among local participants but among all health professionals and agencies throughout the state have been vital. From the beginning, there has been an exchange of information and ideas among members of the nursing licensing board, the state nurses association, and appropriate committees of the state medical association. The program was explained in detail to the Joint Liaison Committee of the Idaho Medical Association-Idaho Nurses Association which has representation from all state areas.

The Idaho Nurses' Association surveyed all nurses in the state (3,153) shortly after the program was instituted to inform them and get their reactions. The Idaho Medical Association sent a similar survey to all physicians (525). Of the respondents, 82 percent of the nurses and 68 percent of the physicians indicated that they saw the nurse practitioner role as valid. Thirty-three percent of the nurses indicated they would be interested in pursuing such a role; 32 percent of the physicians said they would be interested in employing such a person in their own practice. There was some, but not a marked, difference between the two groups as to what functions should be performed.

Midway in the first four months, while the nurses were at Stanford, a

meeting was held with representatives from the medical and nursing associations and licensing boards, the Board of Pharmacy, the hospital association, the dental association, schools of nursing in the state, and the Regional Medical Program. A progress report was given by the director of the Stanford program and the senior Council physician.

The numerous speaking tours in various areas of the state—Boise, Twin Falls, Lewiston and McCall—by the two nurses and one of the physicians have been an effective means of providing a forum for discussion, lessening those reservations and resistance that may exist.

Practicing in Council

Although the training period was essentially the same for both practitioners, each has developed a unique position on the health care team in her respective community. In Council, Ms. Curtis initially worked in a side-by-side supervised practice with the two physicians in the clinic and in the hospital, developing competencies rapidly.

The day begins for her by making morning hospital rounds with the physician if he is there when she updates progress records. Ms. Curtis makes rounds for the physician if he is unavailable. At the clinic, she screens patients, referring to the physician those beyond her level of competency. She sees many children, treats upper respiratory ailments and ear, nose and throat problems, and gives immunizations.

An important activity for her is patient education. The patient may be too bewildered or disoriented to really absorb the physician's instructions. The nurse takes the time to have the patient tell in his own words how he understands instructions. Often patients discuss with her problems with which they hesitate to trouble the busy physician.

An increasing number of women request that the nurse practitioner do their pelvic exams and Pap smears, stating that they dislike to take up the physician's valuable time when "nothing is wrong with me."

The mother in labor seems comforted to see a familiar face—the same one she saw during her prenatal care. With the physician present, the nurse has delivered 23 babies in ten months—a healthy record for a town of 900!

Having had extensive experience as a surgical nurse, as well as the training at Stanford, this nurse practitioner has sufficient background to function also as a first surgical assistant. Her other activities include making house calls to shut-ins and invalids, and managing emergency room problems.

Every third night she takes call. After evaluating the patient's status she may take care of the problem herself, such as suturing a minor laceration, or ordering essential lab work. If the problem requires medical consultation, treatment may be authorized by the physician via phone or may require his presence. By-laws approved by the hospital Board of Trustees enable the nurse practitioner to admit patients, initiate lab work and x-rays and provide emergency treatment.

The physician and nurse practitioner discuss diagnosis and proposed treatment of patients. Other members of the clinic staff include a lab technician, a receptionist, and an office nurse. An intercom telephone between the clinic and the hospital, which is one mile away, keeps the staff in touch with the progress of acute hospital patients.

For Ms. Curtis, adjusting to the increased responsibilities took some time. Previous patterns engendered in basic education and 20 years of experience in the traditional nursing role made for some discomfort in working as a close associate of the physician. Learning to give orders rather than just take them requires time. She found that the most difficult part of mastering the new role was staying in that role.

Practicing in Cambridge

The nurse practitioner in the Cambridge clinic must function without the daily on-site presence of a physician. A receptionist is the



One of Cambridge's younger residents is all smiles as his responses are checked by Dr. John Edwards and Nurse Practitioner Ortman.

only other full-time staff person at the clinic although the services of a local licensed practical nurse are available on occasion. The clinic is situated in a burned-out building which was purchased and renovated into a modern clinic facility with funds raised entirely by the community and with labor donated by local townspeople. In addition to the usual examining rooms, laboratory, and reception areas, space is provided for a dentist and optometrist who make weekly visits.

Each of the physicians travels to

the clinic one afternoon a week to see patients with the practitioner. Three days a week patients are seen only by her. She has the options of taking care of the problem without any medical assistance, calling the physician for consultation, sending the patient to Council for further diagnostic work-up, sending him to the physician immediately, or rescheduling a visit on the day a physician will be there.

As with the practitioner in Council, Ms. Ortman takes histories and gives complete physical examina-

The Idaho Nurse Practice Act was amended to allow the nurse practitioners to diagnose and prescribe under certain rules.



At the Council Community Hospital, Ms. Curtis' day usually begins with hospital rounds, either with or without Dr. Edwards.

tions, routine prenatal and postnatal care, emergency treatment, and immunizations. She makes frequent house calls to homebound patients, particularly to geriatric patients.

A typical day for the Cambridge practitioner may include treating a 43-year-old man with chronic otitis media; administering intramuscular antibiotics after ascertaining an intolerance for the oral drug; consulting by phone with the physician on adjusting medications for a patient with Parkinson's disease; removing sutures from a 5-year-old child who had a cardiac catheterization in Seattle; performing a pelvic exam on a woman with chronic pelvic inflammatory disease; seeing a patient for thyroid regulation; removing foreign bodies from the surface of eyes; referring a patient with a suspected fracture from a logging-mill accident for diagnostic x-rays; performing routine physical examinations on pre-school children, high-school athletes, and bus-drivers.

Because the economy is largely agricultural or forestry-connected,

the incidence of allergy with sinus problems is high, necessitating desensitization injections. Ms. Ortman estimates that she herself can handle 90 percent of all upper respiratory tract infections.

She finds that she has the time to give supportive therapy to the large number of women presenting menopausal symptoms and receiving hormonal treatment, and, in well-child care, to discuss development and nutrition, and to offer anticipatory guidance and reassurance to parents. She is often able to determine changes in cardiac status, making appropriate changes in therapy. Patients with acute illness, with positive lab findings, are generally referred to the physician either by phone consultation or a visit. Referrals to specialists may be made after consultation by phone with the Council physician, if a problem is acute.

A lab technician is not available in the clinic so that the nurse must perform her own laboratory procedures. Feeling a need for additional training in this area, Ms. Ortman spent extra time perfecting her techniques with the hospital lab technician in Council.

Because the nurse is the only immediate medical resource, she may be called at anytime—nights as well as weekends. Three quarters of these problems can be handled over the phone.

Many people in Cambridge are seeking medical attention for their problems much earlier since the nurse practitioner is in the community, and they do not have to travel miles for medical assistance. More than ever, patients present themselves before a problem becomes a crisis and it is possible to emphasize the value of preventive medicine. One 86-year-old woman came to the Cambridge Clinic shortly after it opened, complaining of shoulder pain she associated with a fall some six months earlier. Unwilling to travel the 22 miles to Council, the woman suffered until she could seek the services of the new nurse practitioner. She ordered an x-ray, con-



House calls to homebound and geriatric patients are an important part of Nurse Practitioner Ortman's practice.

firming the diagnosis of an anterior dislocation of the shoulder, and gave much needed relief to a gratified patient.

The community is very proud of the Cambridge clinic and its acceptance is excellent. During June of 1971, the second month of full operation of the clinic, 352 visits were recorded; in October, 302. In the first five and one-half months' experience, there are records on 437 families even though the population of Cambridge is less than 400. Cambridge Clinic draws from the surrounding communities of Hell's Canyon, Brownlee, Indian Valley, and Midvale. In that same period, the nurse estimates that physician consultation or referral was required on an average of 19 percent of the patients seen in a given week. Most patients have learned that the practitioner's judgment can be trusted and they feel comfortable with her.

Common Policies and Concerns

Both clinics have converted to problem-oriented records, permitting better communication with the physician and allowing a much broader approach to the patient. All records are reviewed by a physician. Prescriptions written by the nurse practitioners are countersigned by a physician when he is at the clinic.

The nurses are on a fixed salary. All billings are handled through each clinic's office, and there is no differentiation in charges for services performed by the nurse practitioner. In addition to malpractice insurance carried by the nurses themselves, the physicians pay a minimal fee for additional insurance to cover the nurse practitioners.

Health professionals have become increasingly concerned about the legality of having delegated to nurses more and more functions ordinarily understood to be within the practice of medicine. The advent of the nurse practitioner caused further concern in Idaho. Therefore, a physician (co-author of this article) and a nurse legislator had introduced into the 1971 Idaho legisla-



Last minute observations are exchanged as Ms. Curtis and Dr. Edwards scrub for surgery. Ms. Curtis has the experience to serve as first surgical assistant.

ture a bill to amend the Idaho Nurse Practice Act, which passed in February. This permits the professional nurse to perform acts "of medical diagnosis or prescription of therapeutic or corrective measures . . . as may be authorized by rules and regulations jointly promulgated by the Idaho state board of medicine and the Idaho board of nursing which shall be implemented by the Idaho board of nursing." This liberal and progressive law allows the nurse practitioner to function effectively without the constraints which might result in other legislation licensing physician's assistants or by the use of rigid definitions in the medical or nursing practice acts.

Continuing education is as vital to the nurse practitioner as to any other health professional. The regular contact with the physician provides a constant teacher-student relationship with considerable give

and take. Both are stimulated to do further study. All of the medical consultants to the community, including the Idaho Department of Health teams, the University of Oregon Medical School Circuit Riders, and the Southwest Idaho Medical Society, have helped to teach the nurse practitioners how to handle problem cases.

There is a need for such education on a formal basis. Idaho has no medical school, and, to date, no training for the nurse practitioner exists in the state, although two schools of nursing are exploring the development of such programs.

An Exciting Future

What is the future of the program? Physicians in the project view it with increasing enthusiasm as experience grows. Their morale is improved, with more freedom to carry out community activities and spend more time with their families without throwing additional strain on their medical associates. In addition, physician time is released for those problems requiring a high level of medical skill. With this kind of doubling of the health care team, more patients can be cared for without further increasing the physicians' loads.

The nurse practitioners have found more professional satisfaction than in any previous experience and feel they are making a unique contribution as part of the health team with a special emphasis on "care" to the patient. They realize that they are completing their first year of such practice under the watchful eyes of the entire state. Other rural communities with similar manpower problems are interested in instituting this concept into their own areas.

Certainly, because of this project, health care is more available and more accessible to a greater number of Idahoans in this segment of the state. And the project seems to have proved already that if the problem of medical manpower shortage is to be solved, the use of nurses in such expanded roles is one important solution. △



MOUNTAIN STATES REGIONAL MEDICAL PROGRAM

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WESTERN INTERSTATE COMMISSION FOR HIGHER EDUCATION

Chicago Daily News

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Flight to suburbs

Record exodus of doctors here

by Arthur J. Snider
Daily News Science Editor

Chicago's ratio of physicians to population is the lowest in the city's history and is expected to establish new records every year for the next 20 years.

A new study, "Where the Doctors Have Gone," showed that the outward flight is increasing at a faster rate than the shift of the general population.

While still the nation's medical mecca as headquarters for medical organizations, Chicago

has half as many doctors per capita as it had in the 19th Century.

"Incredibly," the report noted, "metropolitan Chicago's physician-population ratio in 1970 was one-fifth below that of the average for the nation's large metropolitan areas."

THE STUDY, conducted by Dr. Donald Dewey of DePaul University and published by the Illinois Regional Medical Program, listed these key factors as responsible for the trend:

- The higher socio-economic

status of the north, northwest and west suburbs.

- Growth of professional buildings in the regional shopping centers.
- Changing racial structure of Chicago.
- Physicians' desire to practice near their homes.

"More physicians live in Evanston than in all of Southwest Cook County," Dewey writes. "More live in Winnetka than in all of Will County. More live in Skokie than in all

Turn to Back Page, this section

Doctor exodus drops city's per-capita count to new low

Continued from Page 1

of Kane County, and more live in Lincolnwood than in all of McHenry County."

Contrary to belief, hospitals move to where the doctors are rather than doctors following hospitals, Dewey said.

HE CALLED for a moratorium on federal construction funds and other public subsidies "that have helped subsidize the suburbanization of physicians and hospitals."

"Instead," he continued, "these federal funds should be diverted to inner city hospitals to be used to equip and operate outpatient departments that would provide primary ambulatory care in communities lacking private physicians."

Underscoring the disparity, Dewey said the 10 most impoverished communities within the city dropped in the last 20 years from about one doctor per 1,000 population to a little more than one-fourth doctor.

The 10 most affluent suburban communities, however, inflated their ratio from 1.78 per 1,000 to 2.1 in the same 1950-1970 period.

Oak Park, Hinsdale and Evergreen Park made the greatest gains, while West Garfield Park and Auburn-Gresham suffered the greatest losses.

HOW THE INFLUX of blacks results in an exodus of doctors is pointed up in comparing West Garfield park on Chicago's West Side with Oak

Park, a suburb of similar population two miles further west.

Garfield Park changed from zero black population in 1950 to 96.8 per cent black in 1970. The racial structure of Oak Park (less than 1 per cent black) hardly changed in the same period.

In 1950, there were 161 physicians in West Garfield Park but in 1970, only 13. Oak Park on the other hand, had only 7 doctors in 1950 but the number rose to 276 by 1970.

West Garfield Park's doctor-to-population ratio fell from 3½ per 1,000 to about one-fourth doctor per 1,000, while Oak Park rose from 1.15 to 4.42, or from one doctor for every 870 people to one for every 225.

EXTERNSHIP PROGRAM FOR RURAL AREAS

Over 100 applications from health science students around the country have been received for enrollment in the Lakes Area Regional Medical Program's Rural Externship Program this summer.

The program is designed to provide students with working and living experiences that hopefully will interest them in a rural health career after they graduate. Students are placed with a preceptor or health professional in assigned rural communities.

William D. Crage, director of the Rural Externship Program, said "while only 40 students can be accepted, at least 70 will have to be turned away because of the lack of funds. The urgent need for professional health manpower in rural areas still exists; the calling is there, as are the students".

The program, funded and organized by the Lakes Area Regional Medical Program, and local community contributions, was initiated in 1970 in response to the professional health manpower deficit in rural areas and has placed 102 students thus far.

The program has expanded to include students in the fields of medicine, dentistry, nursing, nutrition, pharmacy, physical therapy, medical technology and podiatry. Each student receives a weekly stipend and works directly with a health professional.

Florida Regional Medical Program

Supplement

To the Journal of the Florida Medical Association

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Florida Regional Medical Program

An Overview

GRANVILLE W. LARIMORE, M.D., GORDON R. ENGBRETSON, PH.D.,
AND COYLE E. MOORE, PH.D.

The Florida Regional Medical Program is one of 56 established under Public Law 89-239. The law sets forth the purposes as:

Through grants to encourage and assist in the development of regional cooperative arrangements . . . to afford the medical profession and the medical institutions of the nation through such cooperative arrangements, the opportunity of making available to their patients the latest advances in diagnosis and treatment . . . by these means to improve generally the health manpower and facilities available to the nation and to accomplish these ends without interfering with the patterns, or the methods of financing, of patient care or professional practice, or with the administration of hospitals, and in cooperation with practicing physicians, medical center officials, hospital administrators and representatives from appropriate voluntary health agencies.

The original law spoke to the area of "heart disease, cancer, stroke and related diseases." Subsequent amendments (Public Law 91-515) and administrative practice broadened the scope of the Program and enabled the regions to operate in other areas of need as determined by the regions themselves.

The Florida Regional Medical Program (FRMP) stated as its objective:

"To raise the levels of health care in Florida by assisting physicians, allied health personnel and their medical institutions in providing the highest quality health services in their own communities, increase accessibility and availability of these services and to promote the most modern health services with special attention to heart disease, cancer, stroke, kidney disease and related diseases."

Program Characteristics

There are three unique characteristics which tend to set regional medical programs apart from

Dr. Larimore is Director and Dr. Engebretson Deputy Director, Florida Regional Medical Program. Dr. Moore is Chairman of the Florida Regional Advisory Group.
This work is supported by funds provided by Title IX of the Public Health Act. The findings and conclusions reported do not necessarily represent the views of the Public Health Service.

other federally funded activities in the health field. These are:

1. Local decision-making: Decisions regarding the assessment of need, determination of priorities and allocation of funds among approved projects are all made within the region. (In the Florida Program, the "region" includes the entire state, others of the 56 regions are made up of parts of a state or combinations of states or, in the case of 34 regions, consist of a single state like Florida). In each region provision is made in the decision-making process for maximum participation by those most knowledgeable about the region's health needs.

2. Cooperative arrangements: Public Law 89-239 calls for "regional cooperative arrangements" and one of the accomplishments of the Program has been to bring together all of those concerned with health services in the interest of developing the cooperative arrangements which are the foundation of all regional medical program activities.

3. Provider orientation: While there is consumer representation on the Regional Advisory Group, the policy-making body for the Program, it and all of the expert committees involved are dominated by health care providers. Of the 350 volunteers who provide expertise and guidance for the Florida Regional Medical Program, over 300 are physicians or other health professionals with physicians in by far the majority.

In fact, physicians have occupied a key role in the Florida Regional Medical Program from its very inception. It was the Florida Medical Association acting through the Florida Medical Foundation that served as the initial fiscal guarantor of the Program. This action enabled the Program to get under way after some months of uncertainty.

In the Florida Regional Medical Program, the responsibility for planning lies with the Florida Regional Advisory Group. Basic to its planning role, the FRAG solicits input, information, data, opinions, reports, from those to be served. Such input comes from the membership of the Group itself among whose members are providers of health care services.

Health and educational institutions, agency and organization representatives on the Group likewise provide input necessary for the planning process. The State Comprehensive Health Planning agency as well as local health planning councils, medical association, nurses association, hospital association, representatives of voluntary health organizations and others are examples of agency and organization participation.

Planning requirements of a more sophisticated scientific and technologic nature are satisfied through input furnished to the FRAG from its special advisory Task Forces, Councils and Committees. Membership on these groups consists of eminent Floridians with expert knowledge and experience about special diseases or health care problems. These experts along with staff, advise the FRAG of scientific and technologic advances, innovative approaches to the delivery of health care, new application of existing knowledge, or the need to develop new or to use more effectively existing health manpower.

The Board of Directors of the FRMP, Inc.—made up of the deans of the medical schools, rep-

resentatives of the voluntary and public health agencies, hospital administrators and practicing physicians—likewise has an opportunity to contribute to the FRAG's planning activity. While the role of Board members is confined to managerial affairs of FRMP, Inc., their advice and participation is solicited by the Group. Experts in their own right in various health problems and health care delivery systems, members of the Board have, on a number of occasions, suggested solutions to some of Florida's health problems.

Evaluation

The Florida Regional Medical Program begins its evaluation process at the inception of a project idea. Various ideas are considered in light of FRMP objectives and are weighed for their potential contribution toward reaching the objectives of the Program. If project ideas are determined to have merit, a staff member is assigned to assist the applicant in preparing his formal application materials. Counsel is provided the applicant regarding clarification of his objectives, development of methodologies which will assist him in reaching these objectives, and elucidation of an evaluation procedure which will provide ways of measuring progress toward the project objectives.

In some instances, FRMP staff have assisted project directors to establish standards of performance against which to measure progress. Reporting systems designed to aid project directors in assembling data in a form which can be readily

PROJECT TECHNICAL REVIEW	PROJECT PROPOSAL FUNDING RECOMMENDATIONS DECISIONS	FRMP PROGRAM MANAGEMENT
<p>Task Force/Councils FRMP staff</p> <p>Regional Advisory Group Planning and Evaluation Committee, Site Team Task Force/Councils CHP a or b agency</p> <p>Assess anticipated and real success</p> <ol style="list-style-type: none"> 1. Determine merit of new proposal/contract 2. Provide ongoing review 3. Recommended changes 	<p>Regional Advisory Group</p> <p>Planning and Evaluation Committee Regional Advisory Group</p> <p>Recommend allocations of funds</p> <p>Allocate funds</p>	<p>Board of Directors, FRMP, Inc. FRMP Director</p> <ol style="list-style-type: none"> 1. Receive, administer and account for funds 2. Review affiliation agreements with respect to: <ol style="list-style-type: none"> a. Eligibility for and conformance with federal funding requirements b. Capabilities of affiliates to manage grant funds c. Fiscal and administrative procedures d. Provisional and final indirect cost for affiliates <p>Manage FRMP funds in accordance with federal regulations.</p>

analyzed have been developed. An example of a data reporting system is one designed to assist in the analysis of various medical treatments rendered to patients in and out of coronary care units to determine the most effective methods.

Project directors are required to furnish monthly reports describing project activities, difficulties encountered, pertinent information and data and an analyses of findings. These reports are summarized for the FRAG and provide it an opportunity to redirect ineffective project activities. In addition to written reports, numerous telephone conversations between project directors and the FRMP staff determine interim progress providing opportunity for staff to render assistance in solving problems of an urgent nature.

Projects are site visited by FRMP staff at least semiannually, sometimes more frequently. These visits are cordial and are not viewed as a policing action. Honest sharing of information and exchange of ideas have led to innovative modifications and improvement in the conduct of project activities.

Feedback is provided to the various FRAG task forces, councils and committees in the form of semiannual progress reports on all operational projects. These reports are prepared by FRMP staff and are based on monthly reports filed by the project directors, site visits by the FRMP staff and correspondence or other communication with the principals involved in the conduct of the project activities. On occasion, a particular task force may request a project director to appear personally and report on his project. This opportunity is also provided to the FRAG and the FRMP Board of Directors. On several occasions, the FRAG and the Board have elected to invite project directors to attend one of their meetings to learn firsthand of the impact of FRMP programs on the health problems of Florida.

Similar information and data are furnished to the FRAG Planning Committee to assist their appraisal of progress in solving Florida's health care problems. Such information, based on the solving of problems and changing of needs, is used to update and revise priority areas of concern to the FRMP.

The flow of information is then directed to the FRAG Priorities and Evaluation Committee. This Committee, which reviewed the original project application, has the responsibility of judging whether the objectives originally proposed are indeed being accomplished through the project activities.

Decisions regarding allocations of funds among continuing and new projects are made by the FRAG's Priorities and Evaluation Committee. Input to this decision-making process is furnished in the form of staff analyses of project activities, reports and recommendations from the various FRAG task forces, councils and committees, and, on occasion, when the technical aspects of a project require special expertise, findings and recommendations of technical site visit teams or special consultants. Those projects which (1) show satisfactory progress toward accomplishing objectives, and (2) will assist the Program in meeting its overall objectives are recommended for continued funding. Funding recommendations are forwarded to the FRAG who, in consultation with the FRMP Board of Directors, may approve project continuation, redirection, or discontinuance.

A continuing concern of the FRAG, the FRMP staff and Board is that project directors diligently work toward developing new funding sources during the term of their project. In fulfilling its catalytic role, the FRMP endeavors to see that the activities initiated and refined during the project period be continued through support of the affiliated institutions or other funding sources.

This review process has enabled the FRMP in the relatively short period of its existence to address itself with considerable success to a wide variety of the state's health needs. Many of these activities are described in this special supplement to the Journal. Space does not permit a description of all 37 of FRMP's current projects and contracts.

Among the major activities of FRMP are those directed toward such important health service areas as:

A statewide Emergency Medical Service System.

A coordinated chronic dialysis and kidney transplant program.

An intensive care program for newborns aimed at reducing the 1,800 annual infant deaths.

A coronary care unit nurse training program that has prepared more than 500 nurses to serve in coronary care units.

A nurse-midwifery program aimed at reducing the 1,500 deliveries now done by lay midwives.

Consultation for family physicians in the care of children with cancer (3,200 consultations have been provided for 400 children).

Demonstration programs for the control of hospital-acquired infections.

Out-reach, "Health Guides" programs in three inner-city and a migrant labor area.

FRMP operates with a small staff and a minimum of overhead. All of the 37 projects are being carried out at a total annual cost equivalent to approximately 25 cents per capita based on FRMP's current funding level and Florida's population.

As this is written the national administration has declared its intention of phasing out regional medical programs and the President has included no funds for the programs in his fiscal 1974 budget year beginning July 1, 1973. Bills authorizing the

continuation of regional medical programs are now pending in the Congress so their ultimate fate is at the moment in doubt.

Without regard to what the future may bring, it is submitted that as a result of the cooperation and support of the physicians of Florida, the Florida Regional Medical Program has made a substantial impact on many major health problems and through the guidance of its Board, Advisory Group and expert committees, has used its funds wisely and effectively in aiding the solution of many of these problems.

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Emergency Medical Services Program In Florida

WILLIAM T. HAECK, M.D. AND SPERO E. MOUTSATSOS, M.S.

Florida lacks a comprehensive system for providing Emergency Medical Services (EMS). In 1970 nearly 1,800 people died in Florida from automobile accidents.¹ During 1970, of the more than 40,000 people who died of heart disease in Florida, 65% died within the first hour of the onset of symptoms.² From national data, it may be predicted that approximately 12,000 of these people might have been saved if they had access to a good EMS System.^{3,4}

Florida lacks adequate laws for the regulation of EMS on a statewide basis. State statutes require only 8½ hours of training for ambulance attendants. It is legal in Florida to transport the critically ill and injured with no attendant in the ambulance. Efforts to obtain adequate state legis-

lation on ambulance services failed in the 1970-71 and 1971-72 legislature. Efforts are being renewed for the current (1973) session. The present law calls for enforcement of the ordinance by the Florida State Division of Health and the county health departments. No state funds, however, have ever been appropriated to enforce the ordinance.

In 1969, with a modest allocation of federal funds from the Department of Transportation through the Governor's Highway Safety Commission, the Florida State Division of Health formally established a Section on Emergency Medical Services. The budget for the Section was \$43,000 during the 1972 fiscal year. This provided for secretarial staff, two EMS field representatives and some funds for education and training. The director of the Section was on loan to the Division of Health from the Division of Emergency Medical Health Services of the United States

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Public Health Service, Department of Health, Education, and Welfare.

In 1970 and 1971, the Section conducted a county by county survey of EMS resources including equipment and facilities and advising counties and cities on the development of local programs. The 1970-71 survey revealed that comprehensive EMS programs, nationally recognized for their excellence, were operational in Jacksonville and Miami. A few other communities were identified as having promising programs underway or under development. However, the vast majority of the counties and larger cities did not have comprehensive programs, lacked satisfactory emergency vehicles and equipment, and had inadequate or poorly trained ambulance personnel.⁵ Only a few counties and larger cities had plans on paper for EMS operations, but these essential services were usually given low priority.

Statewide Plan

In the summer of 1971, the Florida Regional Medical Program (FRMP) reviewed priority health problems in Florida. In view of the lack of a comprehensive statewide EMS program, FRMP accorded the EMS problem a number one priority. Informal conferences were held with representatives of the State Division of Health, the state's medical schools, Florida Medical Association, Florida Hospital Association, and the existing EMS programs in Jacksonville and Miami. It was agreed that the Florida Regional Medical Program should develop a statewide plan to help improve emergency medical services to be operative within the Division of Health of the Department of Health and Rehabilitative Services of the State of Florida.

FRMP proceeded during the fall of 1971 to develop this plan. The medical literature was extensively reviewed; national authorities were consulted including those at the American Medical Association and the U. S. Department of Health, Education, and Welfare; successful programs in different cities and counties were visited; preliminary plans were reviewed by the state medical and hospital associations and the FRMP Committee on Health Services. The final plan was completed February 1, 1972, and approved as a cooperative enterprise between the Division of Health and the FRMP.⁶

Under this arrangement, the FRMP provides initial funds to the Division of Health for development and support of a statewide EMS program for a period of up to three years beginning

March 1, 1972. The FRMP also provides consultation and other support when indicated.

The Florida Division of Health maintains a central EMS office and facilities and provides the usual managerial and administrative services.

The central office functions in an administrative and leadership capacity directing the program's operations. Seven district offices staffed by FRMP district directors, and Division of Health EMS representatives are charged with implementing the EMS plan in their local areas. Implementation includes the development of regionalized services and formation of state, local and district emergency medical services advisory councils. These councils assist the staff in the formulation of program policies, as well as in planning and monitoring the ongoing program. In addition, some expert subcommittees of the state council have been established in such areas as legislation, finance, training, education, regionalization, communications, and priorities.

The joint program plan serves as the guide for both the central office and the seven district offices. A general administrative manual was developed which includes the policies and procedures to be followed by all personnel of the project.⁷ In addition, a guide for the evaluation of the implementation of the project and its related activities was developed jointly by the EMS central office and the FRMP.

Goals and Accomplishments

The long-range goal of the Florida EMS statewide project is to reduce mortality, morbidity and disability rates. Accomplishments thus far have stimulated the state and local government and the voluntary and professional organizations to become involved in the task of helping improve EMS for Florida citizens.

A state EMS council has been rejuvenated and work is underway to provide advice to the project in all phases of EMS. The council has also provided a forum of discussion and coordination for the many agencies with an interest in EMS. Among organizations represented on the council are:

FMA Committee on EMS; Florida Hospital Association; Florida Chapter, American College of Emergency Physicians; Trauma Committee of the Florida Chapter, American College of Surgeons; Florida Ambulance Association; Florida Chapter, Emergency Department Nurses Association; State Legislators; Florida Association of County Commissioners; Division of Communications; Division

of Health; Comprehensive Health Planning; Division of Planning, Department of Administration, and individual EMS leaders.

The cooperative efforts of the group have helped stimulate the Governor's interest in EMS. He has stated that one of the goals of his Administration is the improvement of EMS. To that end, a multiagency study group was convened and has prepared a preliminary 10-year state plan.⁶

This cooperative effort has also resulted in the preparation of companion House and Senate bills by Senator Poston and Representative Hodes. They are HB 124 and SB 127. If passed, these bills would:

1. Establish for the first time an official group within state government whose sole responsibility is EMS.
2. Establish standard training requirements for Florida's EMT's.
3. Establish recognized standards for EMS vehicles and equipment.

The proposed legislation is also tied to a budget request by the Department of HRS for \$1,000,000 to improve Florida EMS. Two additional bills have been prefiled. HB 447 would establish conditions under which state funds could be allocated to community EMS systems. SB 205 would allocate funding for planning EMS communication systems.

One outstanding effect of project activity has been to stimulate an increase in EMT training in the state. Over 1,000 EMT's will receive the standard 81-hour DOT course in 1973.

At the district level, activities have been concentrated on county and community EMS systems. Many EMS councils have been formed and are studying the needs of their service areas. In some cases, these councils have proceeded to the point of being able to formulate and implement effective local EMS systems. It is anticipated that the formation of local councils will continue and that eventually the entire state will have operative local advisory councils.

The project has also initiated studies to:

1. Define the educational needs of emergency department physicians and begin programs to meet these needs.
2. Define the educational needs of emergency

department nurses and begin programs to meet these needs.

3. Define the capabilities and needs of emergency departments in all areas of the state.
4. Define the retraining needs of Florida EMT's and begin programs to meet these needs.

There is no accurate tool to measure the impact of an effective EMS system. The project is attempting to locate the expertise and funding support necessary to build an appropriate tool. In addition to measuring the impact of new EMS systems, it is hoped the tool will be capable of delineating objectively any deficiencies in existing systems.

An accurate tool to measure the effectiveness of EMS training courses and to identify areas that need to be improved is also needed. This tool will be developed when funds can be located.

Accurate and easy access into the EMS system for Florida citizens is of paramount importance. Centralization of dispatch facilities and use of the 911 System will be explored in more detail by project staff.

Effective telecommunications to link all elements of the EMS system are sorely needed. Efforts to detail exact needs for these communication links are underway.

Over 50 federal programs have authority to fund EMS activities. The project hopes to see that Florida receives its fair share of these funds. Present cutbacks in federal support of health programs are not clear enough at this writing to delineate the effect on federal EMS activities.

As local EMS systems improve, an effort will be made to identify regional health areas. Local systems will be encouraged to meld to effect regional EMS systems.

Summary

The FRMP has funded, and given priority to, the development of an excellent EMS system for the citizens of Florida. The project has helped to unify the fragmented efforts of other groups in Florida in the EMS arena. Project activities are improving both local EMS systems and the status of EMS at the state level. Early evaluation of the project indicates that it will significantly help to stimulate Florida out of the EMS "dark ages."

References are available from the authors upon request.

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Regional Medical Program of Hospital Infection Surveillance

N. JOEL EHRENKRANZ, M.D.

Hospital-acquired infection is a continuing problem of health care in the United States, which is likely to increase as new and sophisticated medical techniques are employed to deal with a variety of life-threatening diseases. Effective treatment of some cancers, heart and kidney diseases and cerebrovascular accidents may paradoxically increase infection. It is estimated that 50,000 to 70,000 Americans die annually as a result of hospital-associated infections—roughly the same number as die from automobile accidents. The cost of hospital-associated infections is estimated to exceed \$500 million per year. Thus, this is clearly an important problem in health care which has not disappeared with development of new antibiotics, vaccines and therapeutic devices. In fact, infections at times have occurred as a direct result of some of these therapeutic efforts. Moreover, hospital personnel including physicians and nurses may be exposed to other infectious diseases such as tuberculosis and hepatitis in the hospital setting—in some cases without being aware of the risk to themselves and their families. The diagnosis of tuberculosis or hepatitis may not be readily apparent in patients who are actively spreading infection.

The immediate goals of this Regional Medical Program of Hospital Infection Surveillance (Program #46) are the following: (a) To educate nurses, physicians, administrative and support personnel in criteria of hospital-associated infection and its recognition, and identification of patients and personnel at risk to hospital infection; (b) To examine conditions of hospital architecture, patient placement and use of various therapeutic devices that promote dissemination or acquisition of infection. The long range goal is to elevate the standards of hospital care so that infection is decreased or eliminated.

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Training and Responsibility

The administration and staff of a group of hospitals in Dade and Broward Counties have made commitments for ongoing involvement and support of the program. Nurse-epidemiologists, physicians, administrators and other interested personnel from the participating hospitals attend weekly classes in the theory and practice of detection of hospital-associated infection and its prevention. Course work includes instruction in a standard approach to observing and recording rates of hospital-associated infection by organ site, infecting organism, geographic place of infection, professional service, patient risk factors, etc. This permits appropriate comparisons within a hospital or between hospitals. Formal course work covers mechanism of acquisition and spread of infection, analysis of published outbreaks, various strategies of prevention and measurements of efficacy. In addition to regular classwork, there is a weekly visit to each hospital by the physician-epidemiologist during which individual hospital problems are analyzed, including a review of procedures which are in force for prevention of infection, or limiting its spread. The potential for acquisition and dissemination of infection in various parts of the hospital is examined in great detail. The physician-epidemiologist is also available on short notice for on-the-scene investigation of outbreaks or review of episodes of hospital infection, and assistance in preparation of the monthly hospital infection committee report. He attends and participates in the monthly meetings of the hospital infection committee.

A number of specific areas has been examined in each of the participating hospitals. These include the type, cost and use of disinfectants; means and techniques for isolating infective and susceptible patients; flow of traffic within and between certain high risk areas; types of environ-

mental sanitation and ventilation; laboratory capabilities and limitations; employee health practices and awareness of types of hospital infection exposure of employees; type of infection reporting currently in use; discrepancy between reported and observed rates; use of various therapeutic devices known to be associated with spread of infection and efforts made to limit this to what is necessary for good patient care; responsibilities of the hospital infection committee; recommendations of this committee as a result of recognition of problems and examination of action taken.

Physician-epidemiologists each serve four or five hospitals on a regular basis. They review the records of patients considered by the nurse-epidemiologist to have had hospital-acquired infection to be sure the criteria for infection have been met. They review the results of environmental surveillance studies and aid in selection of sites to be studied. They analyze clusters of infection to seek a possible common source and thus try to detect at the outset an outbreak of infection or unusual predilection for disseminating microorganisms. They participate in review of antibiotic usage, antiseptic administration and related substances. They make rounds in the hospital seeking out unreported infections. To the extent possible, physician-epidemiologists render unbiased and consistent opinions. Their aims include elimination of serious hazards which may promote infection. These they seek out in cooperation with a hospital's nurse-epidemiologist and microbiologist. Once such hazards are detected, the responsibility of the physician-epidemiologist is to advise the hospital infection committee and the administration of the full implication of the hazard, so the committee can make informed decisions. Reportable infections of broad community importance are at times detected, and the physician-epidemiologists encourage prompt reporting of such infections to the county health department.

A computer program is currently being written for analysis of the data of the individual hospitals. This will provide each hospital with a detailed summary of its own rates of infection on a monthly and annual basis, along with comparisons with the other participating hospitals in a coded rank order, in order to preserve confidentiality. Hospitals that show significant departures from the mean infection levels of the group will be investigated as to cause, with a full report to the Hospital Infection Committee, including appropriate recommendations as to means for improvement.

Broad Education Program

A further function is a broad educational program addressed to the community of health workers who are interested in hospital infection. Health workers including personnel from academic centers and public agencies are invited to attend the weekly classes given by the Miami based physician-epidemiologists—Dr. George Counts, Dr. Phineas Hyams and myself, and our chief infection control coordinator, Leilani Kicklighter, R.N. In addition, all are welcome at our annual seminar which is conducted by a faculty of national prominence. In the seminar concluded in January 1973 the faculty included: Miss Suzanne Legace, head nurse-epidemiologist from Ottawa General Hospital, Miss Elsie Buff of the Florida State Division of Health and Dr. George Jackson of the University of Illinois. A number of topics germane to hospital infection were explored in depth. These included techniques of surveillance of hospital infection, laboratory methods in detection of hepatitis, drugs and vaccines in influenza prevention, the need for antibiotic restriction and methods for evaluation of environmental contamination. These educational activities plus related publications have been made possible through the financial support of the Florida Regional Medical Program and the participating hospitals.

Finally, educational activities are carried out on a one-to-one basis when the need arises. It is obvious that each of the physician-epidemiologists has this as a prime role. In addition, individual consultation is available with Mrs. Kicklighter in matters dealing with nursing, and with Dr. George Counts in matters related to laboratory procedures.

We have been greatly encouraged by the enthusiasm of the staffs of the participating hospitals and by our first results in improving conditions leading to spread of hospital-associated infection. A number of new hospitals wish to join the group. We hope to be self-sustaining in another year. Our limiting factor in expansion is being able to provide adequate numbers of trained professional personnel.

In the largest sense, the program should be seen as involving more than infection. A consistently low rate of hospital-associated infection can be taken as one useful measure of the quality of health care. The ability to measure infection occurring in a hospital, in a reliable and reproducible way, and to decrease the episodes of hos-

pital-acquired infection along with unnecessary expenses for health care, are clearly desirable endpoints. We also feel these are attainable goals. Although hard and fast rules in individual cases may not always be applicable, it should be possible to define the actual rates of wound infection for various surgical procedures, pulmonary superinfection in the treatment of pneumonia, postpartum infection in obstetric conditions—to name a few common problems—and reduce these by improvement in the total care of the hospitalized patient.

In an era when patients with active tubercu-

losis enter general hospitals rather than sanatoriums, when hepatitis outbreaks occur repeatedly in hospitals, when ventilatory assistance machinery and intravenous fluids infect patients during the course of therapy, and persons with various life-threatening diseases such as lymphoma or renal failure are effectively treated with bone marrow suppressants, dialysis or organ transplantations, yet die from hospital-acquired microbes—control of hospital infection must be a major concern.

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Florida Neonatal Intensive Care Program

RICHARD J. BOOTHBY, M.D.

The postnatal course of newborn infants varies from a minimum of asymptomatic adaptation to extrauterine existence requiring only observation and custodial care to a maximum of vital functions equivalent to the intensive care given a critically-ill adult. Thus, organization of facilities, staff and ancillary services can be divided into reasonably distinct groupings according to the care demands of the newborn population.

In bringing about the goal of promoting the intact survival of all infants (intact in this context implies that the infant will function as a complete human being, both physically and intellectually) born in Florida, the Florida Neonatal Intensive Care Program plans to demonstrate the effectiveness of a well-coordinated statewide system of newborn care that will reduce infant mortality and morbidity.

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Operational Activities

Four major components are necessary to produce an effective newborn care program:

1. Identification of neonatal nurseries according to three levels of capabilities and assuring that they are properly staffed and equipped to meet newborn needs occurring in that particular nursery.
2. A communications system.
3. A transportation system.
4. An educational program.

Details of Each of the Four Major Components

Nurseries will be classified according to capabilities and patient population at three levels:

1. Basic Newborn Nurseries.
2. Subregional Neonatal Centers.
3. Regional Neonatal Intensive Care Centers

A basic newborn nursery is one located in the smaller hospitals with capabilities for providing effective care to normal newborns and for stabilizing the newborn in distress before transfer to a subregional or regional center. The basic newborn nursery will care for infants of appropriate gestational age greater than 37 weeks who are asymptomatic. Table 1 lists the resources and capabilities of a basic newborn nursery.

**TABLE 1.—BASIC NEWBORN NURSERY.
RECOMMENDED RESOURCES AND CAPABILITIES.**

The Nursery
Housed separately from general pediatric care unit

The Personnel
A professional nurse is in charge of the nursery
Twenty-four hour coverage is furnished by professional nurses or qualified licensed practical nurses
Physician: Pediatrician or general practitioner on call

The Services Provided
Resuscitative measures
Adequate airway
Adequate suctioning
Etc.
X-ray services
Basic laboratory studies
Blood counts
Blood chemistry
Routine newborn care procedures
Gavage
Lavage
Phototherapy
Etc.

The Education Program
An ongoing planned in-service educational program

Subregional neonatal centers will properly care for newborns and mothers with medical and/or surgical problems. The subregional center will care for the following types of babies:

1. Appropriate gestational age greater than 37 weeks, asymptomatic.
2. Infants greater than 32 weeks gestation and weighing more than 1500 grams, growing and convalescent.
3. Infants greater than 32 weeks gestation, weighing more than 1500 grams, moderately ill.

Table 2 lists the resources and capabilities of a subregional center.

Since the majority of neonatal deaths occur in premature infants from high-risk pregnancies, regional neonatal intensive care centers will be identified to provide the specialized care required for such infants. The type of infant cared for in a regional intensive care center will be as follows:

1. Appropriate gestational age greater than 37 weeks, asymptomatic.

2. Infants greater than 32 weeks gestation, weighing more than 1500 grams, growing and convalescent.

3. Infants less than 32 weeks gestation, weighing less than 1500 grams (until stable), moderately and severely ill neonates, neonatal surgery, ventilatory support.

TABLE 2.—SUBREGIONAL CENTER. RECOMMENDED RESOURCES AND CAPABILITIES.

The Nursery
High-risk nursery is housed separately from regular newborn nursery

The Personnel
A pediatrician specializing in the care of newborns is in charge of the high-risk nursery
A professional nurse is on duty at all times and may be assisted by qualified licensed practical nurses
Consultation specialists available on call 24-hours a day
X-ray
Surgery

The Services Provided
All services available in a basic newborn nursery
Oxygen therapy with automated monitoring
Automated monitoring of vital signs
T.P.R.
B/P
Fluid and electrolytes

Procedures as
Intravenous therapy including venous cut-downs
Umbilical vessel (venous and arterial) catheterizations
Spinal taps
Inhalation therapy
Exchange blood transfusions
Mechanical ventilation

Additional laboratory studies
Bilirubin concentrations
Blood gases
Blood cultures

The Educational Program
An ongoing educational program for physicians and nurses

Tables 3 and 4 list the resources and capabilities of the regional neonatal intensive care center. The only major difference between the Type I and Type II center is the presence of a full-time neonatologist at the Type I. These centers will be strategically located throughout the state in existing facilities in Pensacola, Jacksonville, Gainesville, Tampa and Miami. Initially the centers will be located at Jackson Memorial Hospital, Miami; University Hospital, Jacksonville; Sacred Heart Hospital, Pensacola; Shands Teaching Hospital, Gainesville, and Tampa General Hospital, Tampa. Additional centers may be designated in other locations where adequate personnel and facilities now exist or as they are developed in the future.

TABLE 3.—TYPE 1—REGIONAL NEWBORN INTENSIVE CARE CENTER. RECOMMENDED RESOURCES AND CAPABILITIES.

The Nursery
An intensive care nursery separate from other newborn nurseries

The Personnel
Full-time pediatric staff
Full-time neonatologist
Pediatric house-staff: 24-hour coverage
Newborn intensive care professional nurse in the ratio of one professional nurse to no more than 2 infants: 24-hour coverage
Pediatric specialists in
Anesthesiology
Cardiology
Radiology
Pathology
Urology
General surgery
Cardiac-thoracic surgery
Neurosurgery
Specialists for consultation and service in
Neurology
Nephrology
Hematology
Orthopedics
Infectious disease
Endocrinology
Genetics
Plastic surgery
Transplantation

The Services Provided
All services available in a
Basic newborn nursery
Subregional center
All services provided by physicians listed under personnel
Critical care services of all types including
Complicated fluid and electrolytes
Complicated diagnostic problems
Cardiac surgery
Transplantation
Plastic surgery
Consultation services to subregional and basic newborn nursery physicians and nurses

The Educational Program
Provides ongoing in-service education for physicians and nurses within its facility and educational programs for subregional and basic newborn nursery personnel

Communications System

It is essential that a communications network link the regional intensive care centers with the subregional centers and the basic newborn nurseries. Information essential to providing optimum care for each newborn must be communicated by the referring hospital to the receiving hospital. Another essential service is the need to provide consultant and guidance service to requesting physicians and nurses.

A communication system must be provided through which the referring physician at one nursery can easily contact the regional center for rapid initiation of patient transfer. We hope to accomplish this by means of the so-called "Hot Line" system. This is already in operation at the

University of Florida, and it is our plan to adapt this for the other regional centers in the state.

The communications system is essential in keeping parents and the infant's physician aware of the care their baby is receiving and his progress. If parents and referring physicians are not involved and do not have direct contact with the regional or subregional center, a concept of regionalized care will most probably fail.

Efforts will be made to tie into the statewide emergency medical services system communication network already in existence to avoid unnecessary duplication of equipment, personnel and expense.

Essential to facilitating the communications referral system is an adequate means of reporting and recording information. The system will need to provide standardized information and data regarding the status of a newborn upon transfer between centers, including diagnosis, treatment, patient outcome, follow-up information and care provided.

Transport System

Safe, efficient transport systems will be established including ground and air capabilities.

TABLE 4.—TYPE 2—REGIONAL NEWBORN INTENSIVE CARE CENTER. RECOMMENDED RESOURCES AND CAPABILITIES.

The Nursery
Same as Type 1

The Personnel
Full-time pediatric staff
A neonatologist
Pediatric house-staff : 24-hour coverage
Newborn intensive care professional nurses in the ratio of one professional nurse to no more than 2 infants: 24-hour coverage
Physician specialists in pediatric
Anesthesiology
Cardiology
Radiology
Pathology
Urology
General surgery
Specialists for consultation and service in
Neurology
Nephrology
Hematology
Orthopedics
Infectious diseases

The Services Provided
All services available in a
Basic newborn nursery
Subregional center
All services provided by physicians listed under personnel
Critical care services of all types *except*
Cardiac surgery
Transplantation
Plastic surgery
Consultation services to subregional and basic newborn nursery physicians and nurses

The Educational Program
Same as Type 1

The level of medical care available to infants enroute should not increase morbidity or mortality as a result of the transfer. Experiences with several regional newborn systems in the United States and Canada have indicated that this goal is realistic and obtainable. Modifications will need to be made to meet the care needs of distressed infants such as the addition of portable incubators to existing ambulance equipment. Other services of the Florida Emergency Medical Services System can and will be utilized in transporting infants.

A newborn transport system can be structured either as an autonomous unit based in a hospital or it can be affiliated with an existing ambulance system. The first approach is exemplified by the ambulance service presently sponsored by the Pensacola Educational Program. Another type system is represented by the one operated out of the University of Florida and the one operating in Tampa. Jacksonville utilizes the Emergency Squad Ambulance System. In Gainesville these services include charter ambulance aircraft, while in Tampa it includes the capabilities of McDill Air Force Base Helicopter Services. In either system the essential requirements are availability and adaptability to the specialized needs of newborn intensive care. The transport vehicle must be readily available at all times, day or night, with a minimum alert period. A neonatologist and/or neonatology nurse-specialist should accompany the ambulance to pick up the newborn and provide care enroute.

Educational Program

Development of an effective newborn intensive care system must involve the education of two major groups of individuals—health professionals and parents of high-risk and potential high-risk infants. The educational program for health professionals will include:

1. Updating the knowledge and skills of patient care provider teams (physicians, nurses, allied health personnel, hospital administrators) in all types of hospitals.
2. Developing physician-nurse teams to visit small hospitals to assist them in self-evaluation and to develop appropriate programs for their nursery staffs.

Educational programs for parents of high-risk and potential high-risk infants will include:

1. Informing parents of the purpose and value of different types of care facilities.

2. How these different facilities can provide the care the newborn may need or does need.
3. Situations requiring intensive care and why.

Knowledgeable, skilled and experienced physicians, nurses and other allied health personnel are essential to the success of any regional neonatal care system. They should be able to provide levels of care consistent with their resources and promptly recognize newborns with problems requiring transfer to more sophisticated centers and provide adequate care prior to transport.

Establishing and conducting regional education programs for physicians and nurses is an important and integral component of the program to reduce neonatal morbidity and mortality. Programs must be designed to meet the needs of those providing care to the newborn. Programs developed will utilize existing educational resources to augment the expertise presently available in existing intensive care nurseries. Curricula already available from the aforementioned regional neonatal intensive care centers will constitute a basis for developing the standard curricula for all courses initiated in the program.

Program Organization

Bringing about a coordinated neonatal program to solve medical and surgical problems of the newborn required the appointment of a project director for the program and several advisory committees.

The main committee for the program is the Steering Committee, and it is comprised of members of the Fetus and Newborn Committee of the Florida Pediatric Society. Other members include an obstetrician, hospital administrator, the head nurses of the intensive care nurseries throughout the state and also public health physicians and nurses involved in newborn care.

Four basic subcommittees have been appointed by the Steering Committee: Curriculum Committee, Records and Reports Committee, Policies and Procedures Committee, and Evaluation Committee.

The project director is a physician on 25% time with expertise in neonatology. He functions as overall administrator of the program according to the advice of the Steering Committee.

The nurse associate project director is a nurse on 100% time with expertise in neonatal nursing. She assists the project director in carrying out his responsibilities. The nurse associate project director provides the leadership and coordination for the educational program for nurses,

physicians and allied health personnel. She actively participates in determining learning needs, formulating objectives, selecting content and learning experiences, setting up evaluation tools and restructuring the educational program as the need arises. She assists regional center faculties, organize and implement their programs.

A full-time secretary provides the required secretarial support to the project director and the associate director.

Progress So Far

Since the program became a reality, both physically and financially about the middle of September, 1972, much groundwork has been covered. The project staff was appointed and an office established in Jacksonville. Committee members were appointed and the various committees were organized. It was decided it would be more feasible to geographically locate the various subcommittees; thus people who are in proximity to each other every day can get things done a lot better than particular subcommittee spread over the state. For this reason, the Curriculum Committee was established in Gainesville, Records and Reports Committee in Tampa, and a good percentage of the people involved in the Policies and Procedures Committee are from the Jacksonville area. It was clearly stated at the beginning, however, that this regionalization of the subcommittees did not and should not preclude feed-in to these committees from all areas of the state.

Once the committees were appointed and organized, the Curriculum Committee began its work of formulating the first nurse's course. During November, December and January the Committee worked diligently and this course is now underway at the various regional centers.

The Records and Reports Committee has been working equally as hard and has organized some of the statistical data that will be needed for the program and also certain forms needed to collect data.

Since the inception of the program, there have been five Steering Committee meetings and six such meetings are planned for the coming year. In addition, many members of the program have been meeting on a local level in order to implement the activities of the program.

Goals for Remainder of This Year

Our goals for the remainder of this fiscal year include (1) conduct the course for nurses at least twice at each regional center; (2) hold one or two-day seminars for physicians at the regional centers; (3) have a nurse-doctor team visit basic newborn nurseries for the purpose of evaluating these nurseries and conducting a half-day seminar at each nursery; (4) identify at least 18 sub-regional centers by the end of August, 1973 and identify at least ten basic newborn nurseries by the same time with communications and transportation systems established between all of these hospitals and the regional centers.

Summary

The Fetus and Newborn Committee of the Florida Pediatric Society, with support from Florida Regional Medical Program, has conducted a study and is developing a program to meet the needs of the high-risk infant in Florida. The program is based on a network of neonatal intensive care centers and extends through cooperative referral patterns and an educational program into each community hospital nursery. The Florida Regional Medical Program support is being provided through the Florida Medical Foundation for the implementation of the program which is under the direction of a project director. The main purpose of this program, as with others of its type throughout the United States and Canada, is to show that a reduction in neonatal mortality and morbidity can be accomplished by regionalization of newborn care.

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Florida Renal Disease Program

WILLIAM W. PFAFF, M.D., BEN A. VANDERWERF, M.D., AND DON RIEDESEL

A number of community and university hospitals throughout the state have long had the capacity to take the first step in the definitive management of renal failure. They had the machines and knowledgeable physicians to lower blood concentrations of the end products of metabolism and to reduce circulating blood volume by removing water and electrolytes. Yet, until 1965, this approach was practiced sporadically, generally for the short-term care of individuals with either acute renal failure or in preparation to transfer to a medical center in another area of the country where dialysis and/or transplantation were being developed as a systematic approach to the solution of irreversible uremia.

In 1965, dialysis programs were organized in Gainesville, Miami and Tampa, for the continuing care of patients with renal failure. With the cooperation of uncertain administrators, machines and supplies were purchased and nursing personnel trained to care for patients on a daily basis, assuming many of the responsibilities in the conduct of dialysis.

As predicted by the nephrologists, for indeed they had observed the phenomenon many times in individuals with reversible renal failure, individuals with chronic uremia awoke from coma, their blood pressure became manageable, anabolic functions returned and, in some, return to normal occupation became possible. By this success, a new problem was created. The availability of dialysis to sustain life in patients with end-stage renal disease created a potential logistic night-

mare. In the main, individuals enter a medical system with a serious illness and are either cured, ameliorated to the point that they can leave the immediate confines of the system, or succumb to the disease. An individual with renal failure who is to be managed by dialysis in a hospital setting has a one year life expectancy of 85% and a five year life expectancy approaching 50%. He is dependent upon a machine, supplies and personnel, and the more successful the therapy, the more rapidly must all of these resources be multiplied.

This phenomenon was soon apparent at the University of Florida to the point that no new patients could be absorbed into the dialysis program pending other disposition of patients who had been enlisted earlier. In early 1966, the sole alternative was transplantation. With the aid and support of the combined clinical departments as well as several basic science groups, and with the cooperation of the hospital and medical school administration, a small transplant program was begun. Restrictions on the number of transplants to be performed were initially created by the participants, for at the time the long term results of transplantation were uncertain, the facilities available were limited, and the expense in dollars and effort were sizeable for the numbers of individual patients to be benefited. We chose to use cadaver donors, feeling that this should be the ultimate approach and the problems attached to this route needed solving. The participating personnel were untried and thus a potential living related donor should not be asked to donate a kidney under circumstances that were not truly optimal for success, both because of the state of knowledge then available and the inexperience of the group. Finally, it was concluded that the reported experience at that time could be im-

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proved upon to the point that cadaver organ grafting might yield results similar to those reported with living related donors.

In the ensuing four years, 32 transplants were performed at the University of Florida, all but one from cadaver donors. Our expectations were not entirely met however. The three year survival of transplants was 31%. Patient survival was 40%. In the spring of 1970, reassessment of means, alternatives and new options seemed appropriate.

In the interval, scattered transplants had been performed at other institutions in the state. In 1970, a more formal group was formed at the University of Miami that included all of the components that might be ideally required for the varied and vexing problems that occur with transplantation. This included transplantation surgeons who had prior experience in organ grafting, a tissue typing laboratory to identify ideal pairing of donors and recipients for both living related donor transplantation as well as cadaver transplantation, consulting services to provide expertise in infectious disease, pharmacology, special techniques in radiology, and the cooperation of nephrology services with an extensive experience in several approaches to dialysis.

Kidney Disease Program

In 1970, the Regional Medical Program bill was altered in the senate by an amendment, introduced by Senator Yarborough, which added kidney disease to the previously benighted categories of cancer, heart disease and stroke. Programs aimed at controlling renal failure thus became eligible for funding under this federal approach.

Interested physicians from the state gathered to assess existing resources and deficiencies and then, gathering under the umbrella of RMP, sought funds to correct the recognized insufficiencies.

The strength of the state's resources was an ever-increasing number of nephrologists who were locating in most of the major cities of the state, with near adequate capability for dialysis in Miami and environs. As noted, there were transplantation programs at the universities in Miami and Gainesville. Facilities for tissue typing were identified in Gainesville, Tampa and Miami.

The principal deficiencies were a markedly inadequate dialysis capability in northern and central portions of the state. Using what now ap-

pears to be a very conservative estimate of 40 patients with remedial disease per one million population, only a small fraction of relatively young adults and older children could be managed at the existing facilities in Tampa and Gainesville. Further, individuals were forced to travel some distance from other major population centers for twice or thrice a week dialysis. Once there, dialysis was limited to direct care in a hospital center. Home training facilities and personnel were not available. To digress at this point, home dialysis was being introduced at that time and is a practical means of reducing the costs and expanding the availability of patient management. The patient and a responsible relative are taught the techniques of dialysis, freeing personnel to repeat this task with succeeding patients in cycles of approximately six weeks. Ten to \$20 thousand savings can be appreciated on a patient-year basis. One of the major aims then of the physicians and the Regional Medical Program was to create new dialysis centers in Orlando, Jacksonville and Pensacola, each with emphasis on home training. In addition, home training programs would be added to the units at Tampa and Gainesville.

A second critical area was transplantation. As a grant request was being organized, written, revised and discussed, only 25 transplants were performed at the two centers in the calendar year 1971. At the University of Florida, these were predominantly living related donors and reflected the change in direction elected in mid-1970. Indeed, the survival statistics with living related donors are more encouraging. Graft survival for patients at risk for one year has been 79%. Using world registry tables for comparison, this would foretell long term survival in the 50%-60% range.

At the University of Miami, emphasis at the same time was on cadaver transplantation. When appropriate and available, living related donors are preferable however in both programs, considering the improved survival statistics, expectations, quality and duration of rehabilitation.

It was the purpose of the grant to increase transplantation numbers by subsidizing whatever ingredients were in short supply to deal with a larger load. This included faculty support, nursing personnel, technical assistance and administrative help to tie the diverse efforts together.

A third major area relates to organ procurement, tissue typing and organ sharing. Tissue

typing utilizes serologic techniques to recognize cell membrane antigens that are one determinant of graft acceptance. Within a family, tissue typing, or histocompatibility correlates exceedingly well with transplant survival. Among nonrelated individuals, the logistics, practicality and benefits of tissue typing are not as certain but remain to be determined by continued utilization. It was and remains our intent to transplant organs with the most favorable antigen matching. In addition to identification of shared antigens among potential combinants, the immunologist who conducts a typing laboratory also determines the presence or absence of antibodies against a potential donor, an event that precludes successful transplantation.

Tissue typing and cross-matching require time. Often, the donor, recipient and the typing laboratory are in separate areas. To preserve the kidneys until all ingredients are brought together, the RMP grant has provided for organ perfusion equipment, which allows preservation for up to 72 hours. This has the added advantage in predicting viability when the nature of perfusion in antecedent terminal illness or injury may have produced irremedial damage.

Perhaps the most difficult and rate-limiting task common to all of the participants in the state program is the identification of adequate numbers of cadaveric kidney donors. Many patients with end-stage renal disease simply do not have an appropriate living related donor and the only potential alternative is thus a nonliving unrelated donor. Enlistment of the aid of physicians throughout the state is sought to give notification when individuals, particularly with mortal neurologic injury, might be used as kidney donors. The participating nephrologists and transplantation groups have repeatedly stressed their willingness to cooperate in clarifying the criteria under which a potential donor might be used and the steps to be followed in bringing about such a donation. Recent passage of the Uniform Anatomic Gift Act by the Florida legislature will surely ease this task over the years as larger numbers of our population participate in an elective program.

A number of other activities were proposed within the grant and certainly would be required to earn the adjective "comprehensive" that was initially used to designate the program. This in-

cluded screening programs, physician and public education and the production of antilymphocyte globulin, an immunosuppressive agent of some significant potential use in transplantation. The disallowance of the latter was on the basis of its still experimental nature.

Perhaps one of the more unique features of the RMP grant was co-funding of the administrative apparatus with the State of Florida, relying on a legislative appropriation that created the Florida Kidney Disease Board. Responsibility for administration was assigned to the Department of Health and Rehabilitative Services, and between the state and Florida Regional Medical Program administrations a coordinator was hired to link the activities of the federally financed grant. Abetted by additional financing from the state legislature, the efforts of physicians, scientists, nurses, technicians and volunteers in the state and private universities, community hospitals, county hospitals and independent dialysis units were combined to solve a medical problem that demanded effort, organization and funding.

Six months after the initiation of the RMP grant, the initial goals have been met. New dialysis units are in operation in Orlando, Pensacola and Jacksonville. The rate of transplantation has roughly tripled, and anticipated transplants within the state in the first year of the grant should total 60-75 grafts. The typing laboratories are using uniform techniques. Organ preservation equipment has been used and found workable. Kidneys have been transported from center to center, implanted and found to function. In short, the purposes for which we gathered are being met.

When a statewide program was envisioned, only a fraction of the individuals with renal failure were being recognized, a smaller fraction had dialysis and transplantation available to them. Physicians conducting such programs faced the unwholesome task of denying or postponing procedures that would give both comfort and life. The primary intent of the Florida Renal Disease Program was to ensure care, through dialysis and/or transplantation to any individual with end-stage renal disease. It would now appear certain that the goal can be achieved.

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Continuing Medical Education

MICHAEL J. PICKERING, M.D.

In May 1972 the House of Delegates of the Florida Medical Association voted to require a minimum of 30 hours of continuing education to become effective January 1974. The Committee on Continuing Medical Education was charged with developing the mechanism to implement those requirements. The final drafting has been done.

In the process of developing this document, many questions arose. What type, or types, of educational opportunities are best in producing a change in the behavior of the recipients? What educational needs are there in this state, the area or the community? How best is quality education made available to all physicians? There are many more such questions, but if answers to just these three could be found, great strides in continuing education for the Florida physician could be taken.

Attempting to solve the first question we were faced with little data. Internal evaluation of medical education is of rare vintage. Evaluation of continuing education opportunities is more of a rarity. Such statistics as members that attend or the number of times attended are of no help in determining if that attendance changed or upgraded the practice of the individual. The methods tried previously are each stated to be of value to some. Perusal of the literature has become practically prohibitive. Which of the voluminous articles are fact, fancy or fruitless? To attempt to stay current in a subspecialty in this manner is a Herculean task often not accomplished. Whether these change the practice of the reader is unknown.

Didactic seminars and meetings have been of

suspect value as continuing education for quite some time. Transferring the notes of the speaker to the note pad of the listener is usually a practice in speedwriting. How much is retained, or more importantly, used, is unknown.

Self-evaluation tests have recently been touted as a rewarding endeavor. At least the student has to do some of the work which, according to Sir George Pickering, is required for education. Does the successful completion of such work provide the stimulant and the ability to alter individual patient care?

There is no answer to the question, "What are the needs?" We have not had the mechanism to determine the needs at the point of contact with the patient, and only through this data can one find the remedy that is pertinent.

Pondering the last query leads one to the conclusion that the first two questions must be answered to provide adequate groundwork upon which to make rational decisions.

It is with these thoughts in mind that the Committee on Continuing Medical Education began looking for available mechanisms to provide the opportunity to gather the necessary facts. Ideally, one could gather the proper data by instituting educational opportunities of various types based on established data of needs, containing intrinsic internal evaluation that would be uniform. The FRMP with its functioning district offices, monies for initiating projects and expert advisors offers an excellent chance for a cooperative venture. Preliminary discussions have pointed to excellent cooperation and an exciting chance to gain real facts and thereby provide the patient proof that the physician is constantly attempting to provide him excellence in medical care.

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Dr. Pickering is Chairman of the Committee on Continuing Medical Education, Florida Medical Association.

Comment

ROBERT P. LAWTON

Dr. Pickering's statement accurately raises the specific questions and problems which bear on implementation of the FMA's program of a required minimum 30 hours of continuing education. The Florida Regional Medical Program has the capacity and the desire to assist with the answers to those questions, solution of those problems and general implementation of the FMA continuing education program.

PSRO, peer review, quality assurance and continuing education are all interrelated and have as their common mission continued improvement of the care of the patient through increases in the knowledge and skills of the physicians. The selection of the seminar, course, conference or article which will be of greatest relevance and value to the individual physician and hence to his patients will be determined by constructive peer review of the effectiveness of care. As Dr. Pickering states, some assessment of the impact of continuing education on the physician's practice and on the quality of care received by his patients is necessary and the knowledge that it brings about demonstrable change for the better is essential. Further, it is crucial to the preservation of the system of self-regulation by the profession.

The following may well be the prime principles of a program:

1. Continuing education programs should be related to the major health problems of the people of Florida.

2. Selection of programs, and curriculum de-

signed for new programs, should have major input from practitioners.

3. There should be a major, coordinated segment of program from the three medical schools, with appropriate compensation.

4. New techniques to bring continuing education to busy and/or isolated practitioners in their own practice settings should be devised, tested and implemented.

5. A central registry of accredited programs should be maintained.

6. There should be a central data bank to report the accumulated hourly totals of accredited continuing education for each FMA member.

7. There is widespread agreement that the cost of continuing education programs for physicians will be met by them.

There should be a compact, among the organizations and institutions concerned, pledging a concerted effort to coordinate and rationalize Florida's future system of continuing education for physicians, to implement the principles cited and, in effect, make positive response to Dr. Pickering's questions.

FRMP is drafting such a compact for consideration by the institutions and associations involved. If it continues to receive operational support, FRMP is prepared also to be responsible for the development and maintenance of a total, long range program and generally to work in the closest concert with the FMA.

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Mr. Lawton is Associate Director for Manpower Development and Continuing Education, Florida Regional Medical Program.

Coronary Care Unit Training Program

LOUIS LEMBERG, M.D., AND AZUCENA G. ARCEBAL, M.D.

The introduction of coronary care units (CCU) in the management of acute myocardial infarction has been recognized as one of the most important contributions to medical progress in the last decade. Through intensive monitoring of the patient with acute myocardial infarction, the early recognition and prompt therapy of potentially lethal derangements of heart rhythm have significantly and favorably altered morbidity and mortality. Since the advent of coronary care units hospital mortality from acute myocardial infarction has dropped from 33% to as low as 12%.

Reports indicate that the number of deaths from coronary heart disease in the State of Florida continued to rise from 1950 to 1966. This trend relates to the increasing number of Floridians in their 6th and 7th decade of life. Although a few hospital centers, mainly in the cities, had initiated one to two-week nurse training courses in coronary care and established coronary care units, there were rural areas of the state without facilities for this specialized care of patients. A major factor was the lack of trained nurses, as well as medical personnel to man such units.

In the hope of bringing this special type of medical care to the people in the smaller communities, a comprehensive coronary care training program was conceived for four teaching medical centers of the state. Since the keystone of success is a well trained and motivated nursing staff the course was made available only to qualified nurses.

Courses for Nurses

Through the Florida Heart Association (FHA) and the Florida Regional Medical Program (FRMP), 4-week courses were started in March 1969. The immediate and long-term results were judged to be excellent. Every course included fundamentals of cardiac nursing, basic sciences (anatomy and physiology of the cardiovascular system), electrophysiology and electrocardiography, pharmacology of cardiac drugs, cardiopulmonary resuscitation and the use of specialized electrical equipment for monitoring and treatment of cardiac emergencies.

The Florida Heart Association's Professional Education Committee with its previous two year experience in training nurses for coronary care was able to expand its role in coordinating courses of instruction in coronary care and provide a 4-week course with the help and cooperation of the FRMP. The role of the FRMP in this combined endeavor was significant and decisive in the success of the program.

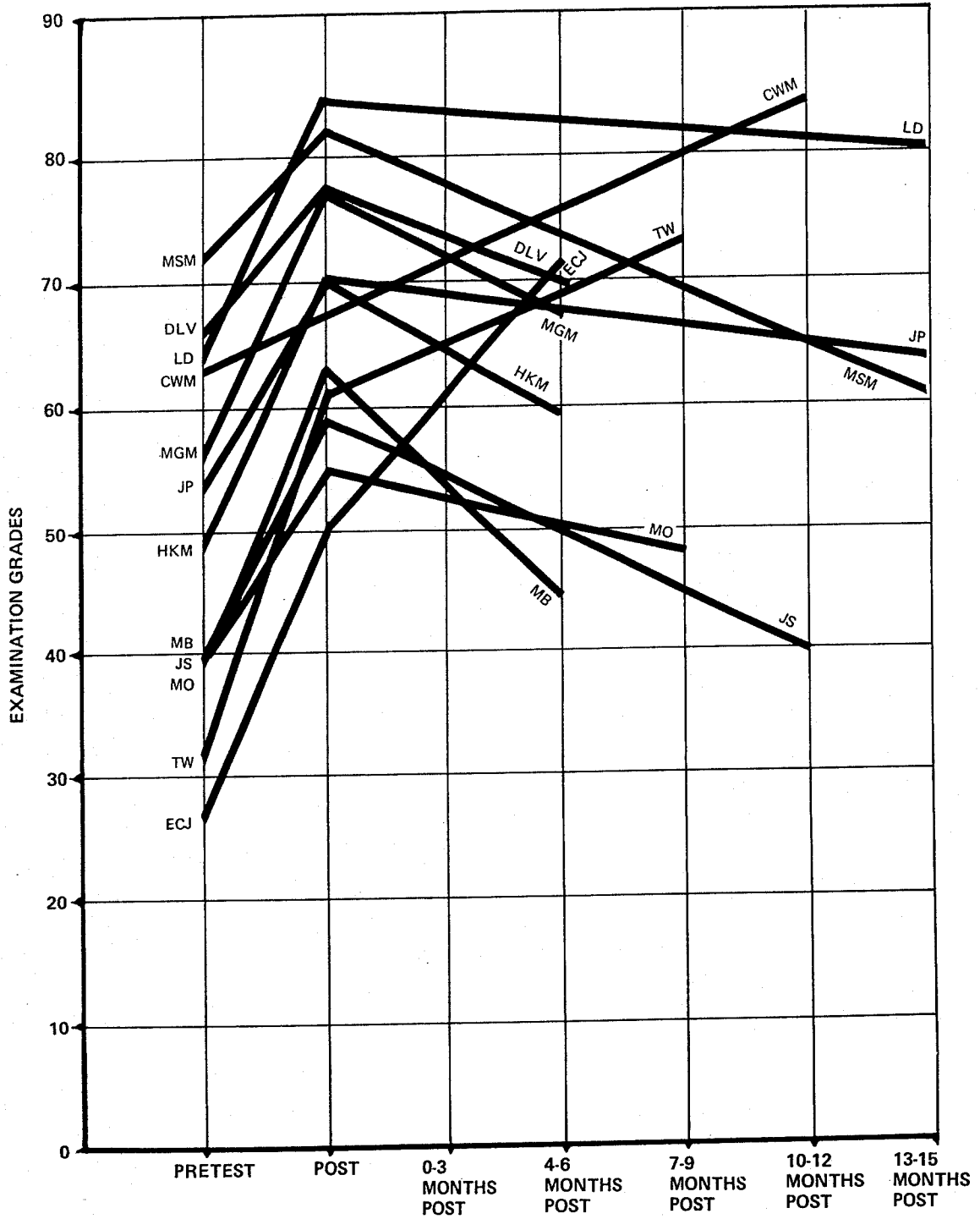
During the three year operation of this project 31 courses were given in Florida with RMP support and coordinated by FHA. Four hundred and seventy-five nurses completed the courses. In addition two multicounty courses were given and 18 nurses were graduated. As was done in the other three teaching centers, uniform pretests were given to each student at the onset of the course, with the objective of evaluating the level of knowledge of each nurse and helping identify future needs of the program. Besides formal lectures, ECG practices and clinical bedside rounds with the medical staff of the CCU, an examination was given at the end of each week in order to test the student's ability in applying the material learned during the preceding week to patient situations.

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FIGURE 1



Graph illustrating pre and post-testing scores. These are compared to the second post-test score given four to 12 months after completion of the CCU course. Note that two physicians showed an improved score in the last post-test.

At the completion of each course, a post-test was given in order to evaluate the level of knowledge attained and how this knowledge was applied in clinical situations. This was not considered to guarantee how well a nurse would function in a CCU but did serve as a measure of her newly acquired capabilities.

Following the completion of the course, these nurses were either employed in a CCU, participated in, or initiated training courses in coronary care in their areas. Many were instrumental in establishing coronary care units in their hospitals.

As an outgrowth of this program of CCU nurses training, courses in other fields of intensive medical and surgical care have emerged. In addition a number of manuscripts have been written by CCU nurses graduating from this program and these have been published in national journals. More recently a textbook in programmed instruction in coronary care has been published by nurses who had completed the program and subsequently became instructors. All of these are evidence of the stimulus this program had on its participants.

Courses for Physicians

A series of courses of instruction in coronary care for the practicing physician were initiated in September 1970. The program was designed to provide close teacher-student relationship to insure comprehensive training and thus the courses were limited to four physicians per session. Priority was given to the general practitioner from small communities in Florida.

The physicians' course consisted of six days of comprehensive lectures and coronary care training with emphasis upon the practical aspects of diagnosis and care of patients with acute myocardial infarction. The days were divided into ten hours of instruction which included two hours each morning of clinical bedside rounds in the CCU and 14 hours "on-call" during the night for problems arising in the CCU. As often as possible, the physician-student was exposed to practical demonstrations of techniques such as cut-downs, insertion of central venous pressure catheters, flow diverted pulmonary artery catheters and arterial needles, pacemakers and cardioversion. Current concepts in the treatment of

myocardial infarction, especially arrhythmias, were emphasized as well as applied electrocardiography, electronic monitoring, and CCU planning and administration.

A list of suggested reading material, together with a pretest was mailed to each physician-student accepted into the program. This served to evaluate the level of knowledge in cardiovascular medicine prior to the course. A post-test was given on the last day of the session. The main objective was to reemphasize points of clinical importance to the practicing physician. During the 16-month program 20 courses were given and 81 Florida physicians were trained.

Postgraduate Seminar

Fourteen months after the first course was given, a one-day postgraduate seminar was held at Jackson Memorial Hospital, Miami. Twelve physicians who had completed the course four to 12 months earlier attended. At the onset of the seminar the physicians were asked to take the same post-test that had been given to them during their CCU training. The order of questions was changed in order to eliminate the possibility of rote memory. The results (Fig. 1) showed that although the majority obtained more or less the same score a few made higher grades. This was gratifying since it was apparent that the retention level was high considering the length of time elapsed. A number of physicians were responsible for setting up CCUs in their local hospitals and also initiating coronary care classes for nurses and other physicians. Some have arranged programs for interesting cases or ECG's. All of these added dividends of this training program attest to its success.

Both the nurses and the physicians courses initially supported by FRMP are being continued on a self-support basis. This is in true keeping of RMP philosophy which was to help initiate and financially support local programs aimed at improving the health of the public primarily through physician or paramedical education and these programs if successful and well established would subsequently be continued on a local self-support basis.

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Intensive In-Service Education for Physicians

ARVEY I. ROGERS, M.D. AND SIDNEY BLUMENTHAL, M.D.

For many physicians, a highly desirable form of continuing medical education is an activity designed to fulfill identifiable needs, oriented around specific, well-defined objectives, and presented intensively in an educational atmosphere, preferably removed from daily work responsibilities. These features formed the basis for the "Intensive In-Service Postgraduate Education for Physicians" activity which has taken place at the University of Miami School of Medicine over the past two years. The program was sponsored by the Florida Regional Medical Program and coordinated through the Office of the Division of Continuing Education at the medical school. The following information is provided to summarize major aspects of this activity.

Basically, brochures mailed throughout Florida announced the program, described objectives, course offerings, and facilities. Interested applicants requested (1st year of mailing) or completed (2nd year of mailing) an application in which specific needs were solicited. If a program was available at the medical school, an appropriate faculty member was selected, the application discussed with him, and the request made that he review the application with a view toward possibly accepting the applicant. Frequently, personal phone calls between preceptor and preceptee ascertained more specifically preceptee needs and preceptor capabilities at the time. This "personal" approach was encouraged, as it provided an opportunity for meaningful communication between student and teacher at an early stage of program design. If agreement was reached, arrangements for specific time period were made; if none was reached, another faculty member was sought. Processing usually took 4-6 weeks. The Division

of Continuing Education coordinated all administrative arrangements pertinent to the trainee's use of medical center facilities and involvement in aspects of patient care. Total cost to the trainee included travel and living expenses as well as those related to leaving a practice for 1-2 weeks; no tuition was charged. With rare exception, trainees felt the experience worth the expense and indicated a willingness to provide a tuition if this became policy in the future.

Tables 1-5 present demographic data related to the 88 enrollments (85 physicians) in the intensive in-service activity. Slightly less than one half participated in programs devoted to cardiovascular and neurological diseases. Fifty-one of the registrants represented the major disciplines of family practice, internal medicine and pediatrics. Physicians tended to come from Dade and Broward Counties (33 of the 85), but 17 total counties were represented. Of the 72 physicians in which ages were known, 42 were between 41 and 55 years of age. Fifty-six had been in practice more than seven years; 46 had been practicing more than ten years. This is gratifying in view of the observation that the half-time for retention of medical knowledge is estimated to be between five and seven years. Of some interest is the appeal the program had for doctors of osteopathy; while less than 10% of Florida's physicians are represented by this group, 17 or 23% of the 88 physicians participating were D.O.'s.

A total of 233 applications were submitted for possible course enrollment. For a variety of reasons, all except 88 enrollments were not completed. The usual reasons were the inability to accommodate the "broad" requests of the individual seeking the educational experience; inability of the individual to narrow his needs to those which had the greatest chance of fulfillment within 1-2 weeks; program not being offered at the medical school; "personal" reasons. Further comment on several of these is appropriate. Many applicants expressed the view that they wanted to

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TABLE 1.—PHYSICIAN ENROLLMENT.

Total Enrolled:	88	(represents 85 individual physicians; 3 re-enrolled)
M.D.	71	
D.O.	17	
Total Course Hours Completed:	4,351	
Age Distribution of Enrollees:		
25-30	1	
30-35	6	
36-40	12	
41-45	13	
46-50	16	
51-55	13	
56-60	5	
61-65	3	
Over 65	3	
Unknown	16	
	—	
	88	

TABLE 2.—LENGTH OF PRACTICE OF ENROLLED PHYSICIANS.

YEARS	NUMBER OF PHYSICIANS
0- 1	5
1- 3	4
3- 5	10
5- 7	4
7-10	10
10-15	11
15-20	13
20+	22
Unknown	9
	—
	88

TABLE 3.—COUNTY DISTRIBUTION OF ENROLLED PHYSICIANS.

Broward	15
Charlotte	1
Dade	18
Duval	3
Escambia	3
Hillsborough	6
Indian River	2
Lake	1
Lee	3
Monroe	1
Okaloosa	1
Orange	8
Palm Beach	7
Pinellas	5
Polk	4
Sarasota	1
Volusia	8
Out-of-state	1
	—
	88

TABLE 4.—PRACTICE SPECIALTY OF ENROLLED PHYSICIANS.

Angiology	1
Anesthesiology	5
Cardiovascular Disease	3
Dermatology	1
Family Medicine	5
Emergency Medicine	2
General Practice	18
General Surgery	2
Internal Medicine	14
Neurology	1
Neurosurgery	1
Ophthalmology	11
Orthopedic Surgery	1
Otolaryngology	1
Pediatrics	11
Physical Medicine & Rehabilitation	1
Psychiatry	4
Radiology	3
Urology	4
Unspecified	2
	—
	88

TABLE 5.—MEDICAL SPECIALTIES IN WHICH PHYSICIANS WERE ENROLLED.

Anesthesiology	6
Cardiovascular Disease	24
Dermatology	1
Endocrinology	3
Family Medicine	1
Gastroenterology	1
Neurology	18
Ob-Gyn	1
Ophthalmology	11
Otolaryngology	2
Pediatrics	11
Psychiatry	1
Pulmonary Disease	3
Radiology	3
Renal Disease	1
Urology	1
	—
	88

get the most for the time and money spent; this was translated to mean that they preferred to review an entire specialty rather than a specific area of that specialty. An individual who desired to learn something about the EKG interpretation of cardiac arrhythmias was more likely to feel that his needs were met by program design than the individual who wanted to "review cardiology." Previous experiences in this approach to continu-

ing education had emphasized the importance of recognizing needs as the basis for realistic program design which offered the best chance to meet needs within the week's period of intensive study set aside. Every effort was made to adhere to this educational objective. We recognize that there are certain shortcomings when program design is based on a physician's subjective assessment of his needs; often, there is no parallel between expressed and objectively assessed needs. The objective assessment of physicians' needs as they relate to patient care is difficult, utilizing tools presently available to educators. Meaningful parameters for doing so will ultimately evolve.

The program was evaluated by questionnaire which attempted to elicit and compare faculty (preceptor) and enrollee (preceptee) responses to nearly identical questions. Questions concerned whether goals were attained, extent to which needs were met, educational tools utilized in the process, amount of time devoted to specific instruction as compared to self-instruction, whether the individuals would participate in similar undertakings in the future, etc. In general, there was agreement and affirmation. Major problem areas related to difficulty in determining specific needs and designing "personal" programs to fulfill the needs. The enrollees were asked whether they felt the experience improved their ability to take care of patients; with rare exception, the response was affirmative. Objective evaluations were not undertaken.

Continuing medical education is a complex process, involving teaching and learning. It is complicated by the many variables relating to methods and evaluation parameters applied to who teaches what, to whom, when, in what form, and for what purpose(s). The very complexity of the process has encouraged useful experimentation; newer methods have evolved. Increasing emphasis on the process of evaluation has forced a closer look at overall objectives, methods, and results. The truly accurate assessment of continuing medical education program effectiveness depends to a great extent on the ability to measure its effect on the overall objectives, methods and results. The truly accurate assessment of continuing medical education program effectiveness depends to a great extent on the ability to measure its effect on the overall quality of patient care. Sustained high quality or improvement in the quality of patient care is an acceptable goal of the continuing medical education process; though probably attained frequently, it is difficult to measure, since "quality" and "patient care" are not easy to define. Evaluation of the process of continuing medical education must await the evolution of an equally complex process, that of the establishment of criteria for quality patient care. The primacy of activities related to establishing such criteria, which must be relevant and sensible, is obvious.

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New Scalar Computer EKG Program for On-Line Central EKG Processing

LAMAR E. CREVASSE, M.D. AND MARIO ARIET, PH.D.

When one considers that nearly 100 million electrocardiograms are processed in this country each year the problem of their systematic analysis, storage, and retrieval is of considerable magnitude. The ever-increasing demands on the health care system for efficiency, cost control, and responsiveness make computers ideal for handling this type of medical data. The speed, accuracy, memory, and logic of the computer provides an excellent system for EKG analysis. The computer furthermore has a capability of handling large volumes of electrocardiograms with rapid turn-around.

A computerized EKG center must provide the necessary service for outlying hospitals with a responsive turn-around system which can return the electrocardiogram to the sending site within a few minutes. The responsiveness of this system is essential for emergency rooms, preoperative evaluation, and many other situations.

It is now possible with the new EKG programs to have a responsive system which is capable of acquiring, analyzing, and returning the EKG analysis to the sending site within three minutes with an accuracy that is comparable to that of physicians with the exception of complicated rhythm disturbances.

Systems

The regional computer EKG system as outlined here is located at the University of Florida College of Medicine in Gainesville and was funded through the Florida Regional Medical Program. It is designed for the acquisition, multi-lead transmission, reception, and recording of electrocardiographic signals from throughout

Florida. The total system consists of data acquisition carts, data transmission phones, and a sequential telephone answering interface which receives both local, WATS line, and emergency calls on a priority basis with tape recorder backup systems. The signals are received by a telephone receiving interface and fed directly into an IBM 1800 computer through an analogue to digital converter. The program analyzes the twelve-lead electrocardiogram¹ and the Frank vector system.² For the University and certain larger hospitals Frank lead vector plots are made available on all abnormal EKG's.

A telecommunication system automatically dials the sending hospital's teletype and returns the scalar analysis to the sending hospital within a three-minute period. The analysis time for both the scalar and vector system is approximately 60 seconds. We are currently processing EKG's from ten community hospitals, the University and VA hospitals, and several smaller clinics throughout the state.

Data Acquisition

Our EKG patient transmitter carts[®] acquire all of the standard twelve leads, three leads simultaneously for six seconds each, and 12 seconds for the Frank XYZ system. In dialing the computer with its sequential telephone priority answering service the call holds until the technician receives an answer signal from the computer. The EKG identification and transmission is now sent directly into our computer with analogue magnetic tape backup. We have a three-channel direct writer in the computer center for monitoring all EKG's or technical problems. In addition, a technical program for noise, missing interrupts, or measurement inconsistencies teletype back the failure of EKG acquisition and analysis. In addition, it signals the sending cart with three audiovisual signals

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This work is supported by Florida Regional Medical Program Project #3.

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that the tracing is unsatisfactory and to repeat. If the tracing is satisfactory, an audiovisual signal so informs the technician.

Computer Programs

A variety of computer programs are available and the major deterrent to the growth and acceptability of computer EKG analysis has been the lack of an EKG program with the reliability and consistency in any way comparable to physician analysis.

The previous first versions of various programs have been evaluated by a variety of groups and are not satisfactory for on-line turn-around without over-read.³ The occurrence of a high incidence of both false positive and false negatives require constant overview by a cardiologist. A perfect EKG program is obviously unlikely because of the multiple variables related to transmission, noise, faculty program logic, and electrocardiographic variations. However, a new EKG program and system with reasonable clinical correlation is now available for the routine analysis of electrocardiograms.¹

Data acquisition, EKG transmission, and computer capability are currently functioning in an efficient manner in a variety of settings.⁴ We have evaluated and refined this program in the University and affiliated VA hospital system utilizing it to service the needs of the regional hospitals and clinics. We have recently implemented the new scalar EKG program and have done a detailed test on a University hospital population of 1,000 consecutive EKG's with clinical interpretation read by two or more physicians and compared in retrospect with the computer EKG analysis. The computer exhibits a high degree of resolution in being able to differentiate normal from abnormal with 97% reliability. The overall computer contour statement accuracy is comparable to the 92% physician accuracy statements correctly stated. The false positives and false negatives are comparable and are related primarily to physician and computer logic criteria employed. The major flaw in our computer EKG programs is the inability to analyze complex arrhythmias such as AV dissociation, supraventricular tachycardia, varying block, multiple ectopic foci, or other complex arrhythmias. The program, however, states

IBM EXPERIMENTAL ELECTROCARDIOGRAM ANALYSIS PROGRAM
 PATIENT NUMBER 0942584 6192 DATE 02/07/72

SINUS TACHYCARDIA, RATE 110

RBBB PLUS LEFT ANTERIOR FASCICULAR BLOCK (BIFASCICULAR)

QRS ANGLE IS BETWEEN -60 AND -120 DEGREES

QRS WIDTH IS GREATER THAN OR EQUAL TO 125 MS

THERE ARE NOTCHED R WAVES IN V1 OR V2

INTRINSICOID DEFLECTION IS GREATER THAN 50 MS IN V1 AND V2

S OR S PRIME WIDTH IS MORE THAN 20 MS IN LEAD I (SINCE QRS ANGLE IS MORE NEGATIVE THAN -45) AND MORE THAN 30 MS IN LEAD V5 OR V6

CONSISTENT WITH ANTEROSEPTAL INFARCTION

Q DURATION IS 40 MS OR MORE IN LEAD V2 (TYPE I)

THERE IS ANY R IN V1 OR V2 PLUS QS IN V3, V4, OR V5 (TYPE I)

INFARCTION PROBABLY ACUTE

J IS ELEVATED MORE THAN .2 MV IN V1 AND V2 OR V2 AND V3, WITH ANTEROSEPTAL INFARCTION

INTERVALS IN MS										FRONTAL PLANE ANGLES IN DEGREES								
P-R	QRS	Q-T	T	P	QRS	P	T	J	QRST									
160	144	345	201	119	-74	64	98	NONE	-69									
---- AMPLITUDES IN TENTHS OF A MILLIVOLT ----										----- TIME IN MILLISECONDS -----								
LEAD ID	Q	R	S	RP	SP	J	P	T	QRS AREA	R WV NTCH	Q	R	S	RP	SP	INT DEF	WPH IND	ABN S-T
I	0.0	3.3	-0.5	0.0	0.0	0.1	0.8	-0.6	30	9	0	92	43	0	0	0	0	0
II	0.0	2.4	-12.9	0.0	0.0	0.6	1.9	3.6	-94	9	0	30	114	0	0	0	0	0
III	0.0	1.6	-16.3	0.0	0.0	0.4	1.3	4.2	-139	7	0	18	125	0	0	0	0	0
AVR	-2.0	4.7	0.0	0.0	0.0	-0.2	-1.3	-1.4	31	7	42	98	0	0	0	0	0	1
AVL	-0.6	9.8	0.0	0.0	0.0	0.0	0.5	-2.2	93	4	15	127	0	0	0	0	0	0
AVF	0.0	2.0	-14.5	0.0	0.0	0.5	1.6	3.7	-125	3	0	25	117	0	0	0	0	0
V1	-4.4	4.0	0.0	0.0	0.0	1.5	-0.6	-1.9	-3	4	70	75	0	0	0	101	0	0
V2	-6.3	6.1	0.0	0.0	0.0	3.5	-0.5	-2.7	2	8	68	76	0	0	0	99	0	0
V3	-12.8	0.0	0.0	0.0	0.0	6.5	0.6	7.0	-68	8	133	0	0	0	0	0	0	0
V4	0.0	4.3	-14.9	0.0	0.0	4.8	0.9	4.8	-56	5	0	28	113	0	0	21	0	0
V5	0.0	5.4	-11.8	0.0	0.0	2.0	0.9	2.0	-39	6	0	38	103	0	0	25	0	0
V6	0.0	5.3	-8.3	0.0	0.0	0.0	1.0	2.2	-30	2	0	48	93	0	0	35	0	0

Figure 1

undetermined rhythm, and these rhythms are then examined clinically at the center. We believe this new scalar EKG program with a 92% overall contour statement accuracy performs comparable to physicians in contour analysis in routine electrocardiographic diagnosis. It has a low percentage of false positive and false negative statements. We are comfortable with its reliability to turn-around with a reasonable answer for community hospitals providing an efficient economical system for electrocardiographic analysis.

In each of our contour statements the logic criteria is printed to indicate how the computer arrived at that specific diagnosis. We feel this is an important quality control mechanism as well as an educational vehicle for physicians interested in electrocardiography. A selected electrocardiogram and printout is illustrated in Figures 1 and 2.

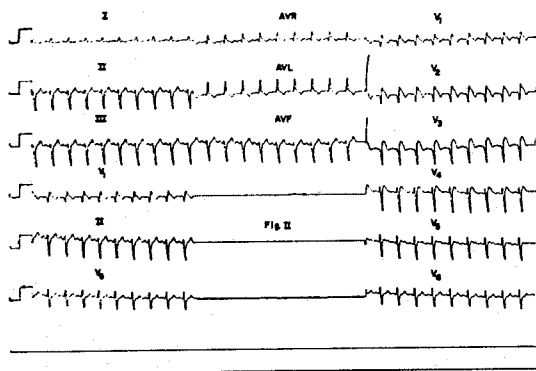


Figure 2

Summary

A regional computerized EKG processing center now provides automated efficiency for on-line analysis of electrocardiograms to a broad spectrum of hospitals and clinics throughout the state initiated by the Florida Regional Medical Program. It brings reasonable expertise in electrocardiographic assisted analysis to areas with and without cardiologists. It assists the cardiologist and physicians without cardiovascular expertise in measurements and contour suggestions. It provides an educational mechanism for physicians through statement of criteria used for each contour statement. Computer assisted analysis at this time provides an economic and rapid mechanism for analysis of the electrocardiogram and assists the physician in EKG diagnosis. However, the clinical judgment of a physician must prevail in relating the computer assisted analysis to the proper clinical situation.

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Cervical Cytology Revisited

JAMES E. FULGHUM, M.D. AND JOHN C. REAGAN, M.P.H.

Cervical cancer claimed the lives of an estimated 258 Florida women during 1972 and another 220 died from cancer of other parts of the uterus. These are, for the most part, preventable deaths. The lives of many are being saved through early detection by the Papanicolaou (Pap) test, a highly accurate, inexpensive and painless test for cancer of the uterine cervix.

Mortality

In Florida, as in the nation, early detection and adequate treatment have been responsible for a reduction in the number of women dying of uterine cancer during the past two decades. Figure 1 shows the death rate of Florida women from cervical cancer by race for 1960-1971. This shows that the mortality rate can be and has been favorably influenced.

A slight increase in the death rate among black females is noted for the year 1971; however, this does not offset the general downward trend of total uterine cancer deaths.

The mortality rate for both white and total has shown a downward trend with a 48% decline in the rate for white women in the past 11 years. Figure 2 shows death rate for cervical cancer among Florida females by age group for the years 1960, 1965 and 1970. There has been a remarkable decline in all age groups for the years 1965 and 1970, as compared with the year 1960. The age group of 65 and over has, however, shown the least amount of decline. Figure 3 shows the percent distribution of deaths of Florida women from cervical cancer by age during 1960, 1965 and 1970. This reveals that in 1970 over 40% of the deaths from cervical cancer were in the 65 and over age group. Concentrated effort must be applied towards the detection of cervical cancer in women over age 55. It should be noted, however, that 18.6% of the deaths from cervical cancer in Florida during 1970 occurred among

women aged 25-44 years, despite extensive cervical cytology screening being carried out in the state. This age group is quite valuable to the community and has the greatest responsibility for the care of many children.

The ADC Project

A monograph, "Cervical Cancer Detection through Cytology," was published by the Division of Health as monograph number 11, 1967.¹ This is a report of a study of 10,174 Aid to Dependent Children (ADC) recipients during the period of 1960-1963 carried out with the assistance of the U. S. Public Health Service. This was one of the first times that a program of this magnitude had been attempted within 18 counties of a state.

The program goal was to screen a large proportion of an indigent, underprivileged and high-risk group of women. During the period, 10,174 women were screened. About 400 or 4% were referred to tumor clinics because of abnormal cytology—Pap III, IV and V. This underprivileged group was biopsied and 205 or about 50% were positive for in situ or invasive cervical cancer; most were treated by indicated methods.

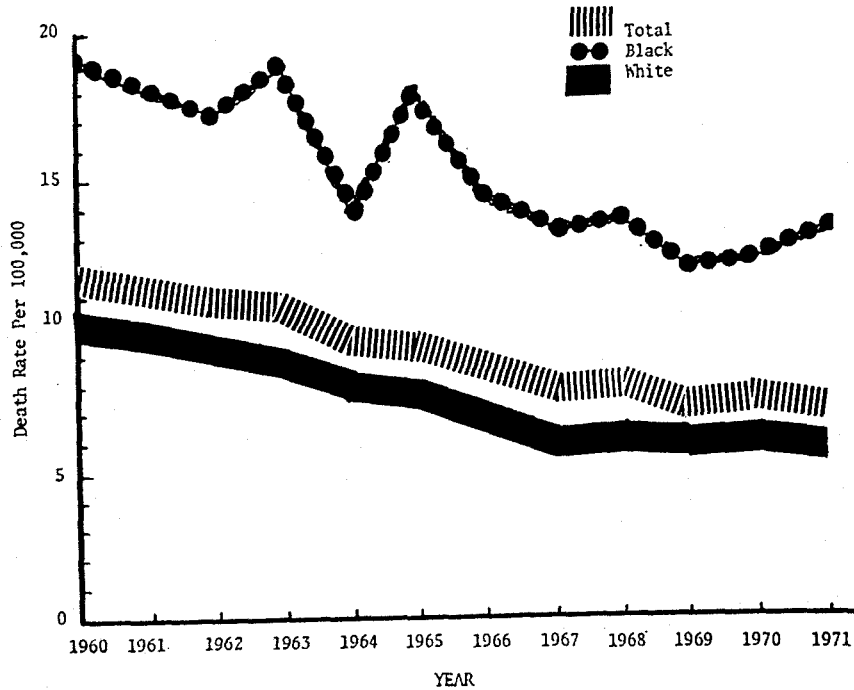
This project did much to raise the index of suspicion as to cervical cancer in Florida. Much valuable information was gained as to the natural history of cervical cancer and resulted in the refinement of techniques applicable to active mass screening.

The ADC Cancer Detection Program, whose influences extended into all sections of the state, has been a source of satisfaction for the official and voluntary health agencies who participated. Its beneficial aspects have continued through the years in many ways, but primarily in demonstrating to the county health departments that permanent ongoing cervical cytology programs for all indigent females could be established as an added service to their already ongoing disease control activities.

Since 1963, most directors of county health departments have established cervical cancer programs as a part of their county health department services. This has been accomplished with financial assistance from the Division of Health, American

Dr. Fulghum is Chief and Mr. Reagan is Health Program Specialist, Florida Division of Health, Jacksonville. Dr. Fulghum is also Director of Project #39, "Cervical Cytology for Certain Hospitals and Health Departments."

FIGURE 1
 CANCER OF CERVIX - DEATH RATE
 Per 100,000 Females by Race
 Florida 1960-1971



Cancer Society, Florida Division, Inc., U. S. Public Health Service, and in recent years—by a three-year grant from the Florida Regional Medical Program.

In 1967, the American Cancer Society, Florida Division, Inc., entered into the cytology program with the Division of Health, and it has been a valuable colleague in aiding with financial support in a number of Florida counties as well as providing excellent public education support to the program. The Florida Division of the American Cancer Society has provided its assistance to screen the underprivileged high-risk group of women through certain county health departments, as has the Division of Health. In 1971, some 63,000 medically indigent women were screened by county health departments or specially selected outpatient hospital clinics. In 1972, Pap examinations were performed on about 97,000 Florida women through the combined efforts of the Division of Health, county health departments, American Cancer Society, Florida Division, Inc., and Florida Regional Medical Program. This figure

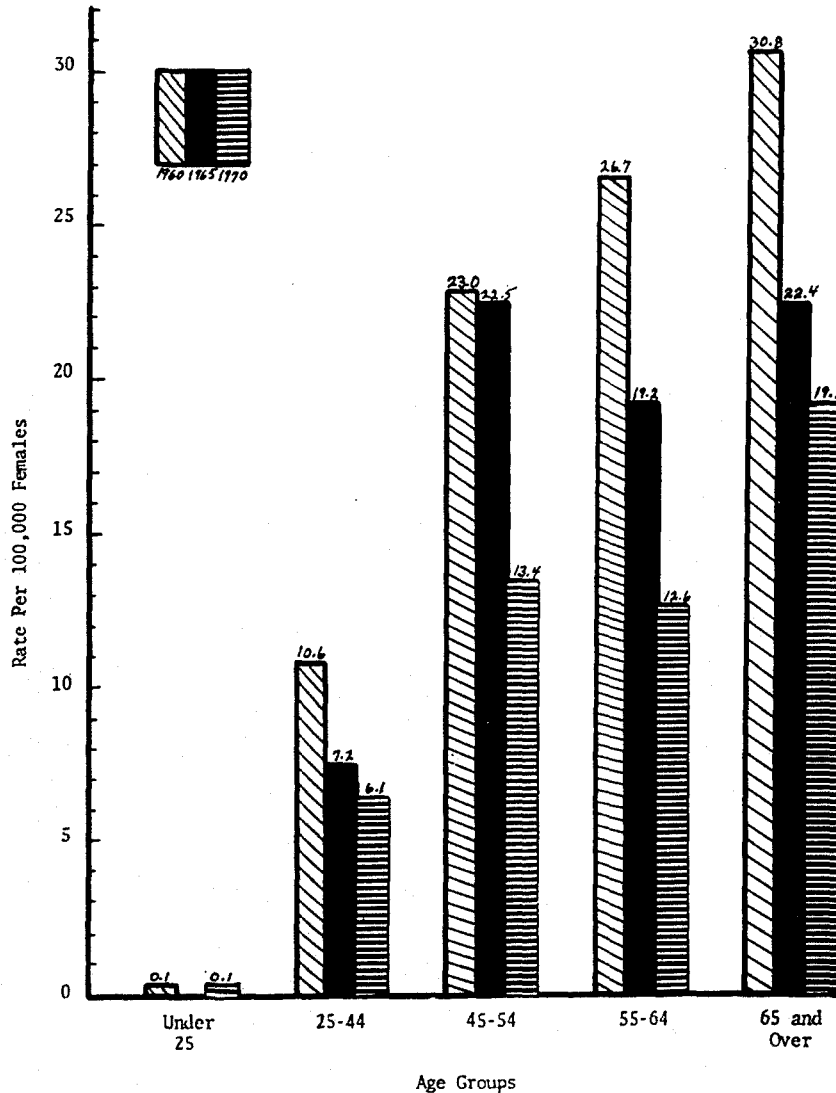
does not include the many thousands of examinations performed by physicians on private patients. Approximately 200 cases of previously unknown cervical cancer were diagnosed and brought to treatment during 1972 by sponsored cancer programs.

The FRMP Component

In 1967 and 1968, the U. S. Public Health Service, through its Cancer Control Program, funded several cytology projects directly to certain hospitals in the state. When the cancer program was sacrificed on the altar of economy by high-level decisions, this left the Public Health Service sponsored activity without support.

In 1969, the Division of Health, on the strong recommendation of the Florida Cancer Council and Cancer Task Force of the Florida Regional Medical Program, made application to FRMP and a three-year project grant was approved to operate cervical cytology programs in certain hospitals and health departments. This is known as Project #39.

FIGURE 2
 CERVICAL CANCER DEATH RATES PER 100,000
 Females by Age Group
 Florida 1960, 1965 and 1970



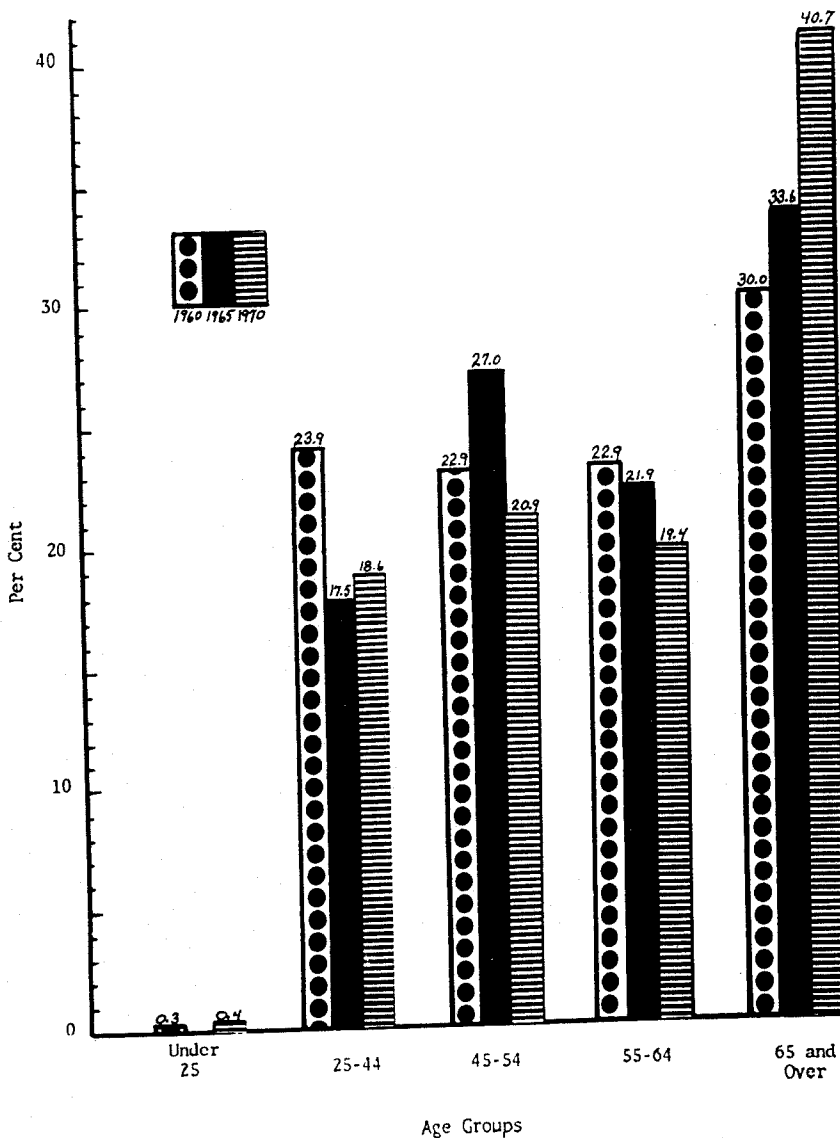
Three centers were established during the first year of the project's operation: Jacksonville, University Hospital of Jacksonville; Miami, Dade County Department of Public Health; and Tampa, Hillsborough County Health Department. During the second year of operation, the project added a fourth center, Pensacola located in the Escambia County Health Department. This expansion completed a statewide network of large scale cervical cytology screening centers. The Florida Regional Medical Program grant support is scheduled to terminate in April, 1974.

ORGANIZATION—Under the project director, each center has a codirector who is responsible for the program's operation. Each center has two

employees, a public health nurse (or clinic nurse) and a clerk or secretary. This seems to be the optimum number for staffing the centers. The average workload for the four centers is about 2,400 persons screened per month.

THE COSTS—Cost for screening to follow-up to treatment has been just under \$5 per person. Fifty-three cents of each dollar pays laboratory fees for slides processed. Each center has been free to negotiate with the local pathologist on a fee for service basis. Forty-two cents of each dollar pays the salaries of the eight full-time employees assigned to the four centers. The time to the project director, the four codirectors and other county health department personnel involved in the

FIGURE 3
 CERVICAL CANCER DEATHS PER CENT BY AGES
 Florida, 1960, 1965, 1970



follow-up and treatment of patients is not paid from nor charged to the project grant. Four cents of each dollar goes for expendable supplies used by the centers. These are purchased through state contracts and result in considerable savings to the project. One cent of each dollar goes for staff travel expenses.

Long Range Objective

The long-range objective of Project #39 is to reduce the mortality from cervical cancer among high-risk females, i.e., those from low socioeconomic backgrounds and/or minority groups. Minority groups include Indian, Spanish-American and Blacks.

Annual short range objectives of Project #39 are to screen approximately 12.6% (4,400) of the target population in Jacksonville; 11.5% (11,500) of the target population in Miami; 8.6% (3,000) of the target population in Tampa and 18.9% (3,000) of the target population in Pensacola.

Target Group

From its inception Project #39 has accepted for testing all females of sexual maturity presenting themselves to the screening clinics. All of these programs are readily accessible to the target population; i.e., medically indigent, high-risk, predominately minority group females. Studies indicate that 97% of the females served by the four

projects are classified as being in the target population.

The Tampa program utilizes another Florida Regional Medical Program Community Interaction Project which employs health guides for a model neighborhood area to make known to the women of the area the availability of the center's medical services. They are also of assistance in follow-up of the women who screened positive. Another center utilizes the local Voluntary Health Agency to provide follow-up services and transportation for many persons who require assistance to get to the center. In other instances, the assets and resources of the community were used effectively to further the program at no expense to the project.

Findings

Since the beginning of screening in June, 1971 some 40,368 persons have been screened for cervical cancer by the use of Papanicolaou examination. The total yield of positive biopsies for this group is 54 cervical cancers, most of which are in situ lesions. All patients have been referred for treatment and most have been treated or are awaiting treatment. These findings are somewhat above the number of previously undetected cervical cancer that we expected to find when the program was planned.

When we compare the rate of 1.3 cancers per thousand females tested for Project #39 to the rate of 20.4 per thousand found during the ADC Project, one might be somewhat disappointed with the yield today. It should be remembered that the ADC group had never been screened previously. The findings today are a tribute to the work previously carried out in the state from 1963 to 1971. Samuel Gunn, M.D., of the Department of Pathology, University of Miami School of Medicine, often refers to the phrase now being used in scientific cytology circles, the "Vanishing Positive Smear."² This is a desirable goal that we wish to attain—no more deaths from cervical cancer. In addition to the suspicious and positive Pap smears, many persons were found with moderate to severe dysplasia, inflammatory changes, trichomonas and other sources of chronic infections. These individuals were urged to seek gynecological care in the hope of preventing in situ lesions of cervical cancers.

Summary

In summary, the findings for Project #39 for the period, June 1, 1971, to December 31, 1972, are as follows:

Total persons screened	40,368
Total suspicious and positive Paps	102
Number referred	124
Positive biopsies for cancer	54
Number cancer cases treated	53
Number cancer cases pending treatment	1
Other chronic conditions such as moderate to severe dysplasia and trichomonas	327

The Florida Regional Medical Program, by providing financial assistance to the Division of Health, has been most helpful at a time when it appeared that some cytology programs would have to be discontinued. The Cervical Cytology Program has continued and expanded to include four active screening centers in populous areas of the state. It would appear at this time that the programs in the four individual centers, funded in part by FRMP, will be continued when the project is phased out.

Uterine Task Force

The Uterine Task Force of the American Cancer Society, Florida Division, Inc., in keeping with the trends of the American Cancer Society, has as its goal "to insure that by 1976 a Pap test is obtained by every woman over 19 years of age in Florida, including those women under 19 who are at special risk." The goal is 2,400,000 women to be tested in the next four years. Careful consideration must be given to how the medically indigent females with suspicious and positive findings can be followed to diagnosis and treatment.

Conclusion

In conclusion, it seems timely to point out that it costs about \$5 to screen a woman for cervical cancer. It costs \$17,500 to treat her for invasive carcinoma of the cervix and then she may very likely lose her life.

Which is the best public health approach? If one fourth of the money now spent by the state on medically indigent women with invasive carcinoma of the cervix and uterus could be used in an examination program utilizing the Papanicolaou method, society would gain considerable in tax dollars spent, not to mention the consideration of lives saved and happiness of the individuals at risk.

References

1. Fulghum, J. E.: Cervical Cancer Detection Through Cytology, Florida State Board of Health, Monograph Number 11, 1967.
2. Panel on Use of Epidemiology, American Society of Cytology Annual Meeting, Washington, D. C., November, 1971.

► Dr. Fulghum, P.O. Box 210, Jacksonville 32201.

RMP! - RIP?

H. PHILLIP HAMPTON, M.D.

The Congress enacted Regional Medical Programs legislation in 1965 following consideration of the report of a Presidential Commission appointed to study national health problems. The Commission recommended federal financial support to establish regional systems for health care delivery centered around medical school affiliated hospitals to provide diagnosis and treatment especially for heart disease, cancer and stroke.

The Congress rejected this proposal but enacted legislation providing federal funds to: "(1) assist in the establishment of regional cooperative arrangements among medical schools, research institutions, and hospitals for research and training, including continuing education, for medical data exchange, and for demonstrations of patient care in the fields of heart disease, cancer, stroke, and kidney disease, and other related diseases; (2) afford to the medical profession and medical institutions the opportunity of making available to their patients the latest advances in the prevention, diagnosis, treatment and rehabilitation of persons suffering from these diseases; (3) provide regional linkages among health care institutions and providers in order to improve primary care and the relationship between specialized and primary care; and (4) improve generally the quality and enhance the capacity of health manpower and facilities and to improve health services for persons residing in areas with limited health services and to accomplish this without interfering with the patterns, or the methods of financing, of patient care or professional practice or with the administration of hospitals, and in cooperation with practicing physicians, medical center officials, hospital administrators, and representatives from voluntary health agencies."*

Initial development of Regional Medical Programs was largely dominated by the faculty of medical schools who often were not entirely disabused of the original Commission proposal. Practicing physicians generally were wary of

federally financed influence on cooperative arrangements of health care providers.

Many of the initial projects were campus oriented and hardly apparent to the community physician and patient. Others were outstanding successes, such as aid to development of coronary care units. Some of the projects of the Florida Regional Medical Program are described in this special supplement to the Journal of the Florida Medical Association.

Gradually RMP regional organizations became more autonomous and oriented to their particular health care problems. RMP's were at their best in the low key role of support to health care and evaluation.

The recent decision of the Administration to deny continued federal financial support to RMP's was founded apparently on insufficient evidence of concrete results to justify the money spent and "because the regional system of health care as originally envisioned has not in fact been realized in the seven years of the programs' existence." The RMP law as enacted by the Congress forbids the program to develop regional systems of health care delivery and the action of a catalyst cannot be readily measured.

Need for the development of cooperative arrangements between health care providers and educational institutions is as great as ever. Now that government is directly financing the cost of health care for 38% of the population, the need for liaison between government and the private medical sector is greater than ever.

The recently enacted PSRO law gives physicians and medical societies the initial opportunity to formally assume enormous responsibilities for the evaluation and monitoring of health care delivery. They need expertise and technical support to fulfill the expectations.

RMP was beginning to develop the provider support to aid in meeting those needs. If the RMP organization is destroyed, what will take its place?

Dr. Hampton is Chairman of the Board of Directors of Florida Regional Medical Programs, Inc.

*From PL-89-239.

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A SURVEY ON

How Ohio Physicians Feel About Physician Assistants

THE USE OF NONPHYSICIANS as assistants has expanded greatly in recent years with the introduction of new allied health professions. This has resulted in new professional organizations which have certified and registered the graduates of programs as well as those experienced in various fields. In addition to being recognized by new or existing health professional organizations, many of these disciplines are referred to as "physician assistant" which is the most dominant of the new types of health manpower.

Much confusion exists regarding the purpose, definition and use of the physician assistant. The variance is so great that the term may be considered "generic" rather than referring to a "specific" discipline.

As of December 31, 1972, Health Careers of Ohio had identified 161 different types of "physician assistant" programs throughout the country. Courses of study range in length from 12 weeks to two years and more. In Ohio, nine programs have been identified. Others have been reported.

The definitions most generally accepted are those introduced in May, 1970 by the National Academy of Sciences which are:

Type A. Assistant has the ability to integrate and interpret findings on the basis of general medical knowledge and to exercise a degree of independent judgment.

Type B. Assistant possesses exceptional skills in one clinical specialty, or, more commonly in certain procedures within a specialty.

Type C. Assistant is capable of performing a variety of tasks over the whole range of medical care, but does not possess the medical knowledge necessary to integrate and interpret the findings.

In Ohio

Ohio currently has no provision for governmental licensing or registration of "Physicians' Assistants," and various health groups have been attempting to survey Ohio physicians to determine the present and future use of this form of health professional.

In 1970, the physician assistant and new types of health manpower were studied by the Health Manpower Committee of the State Advisory Council, Ohio Office of Comprehensive Health Planning, Department of Health, State of Ohio.

In January, 1971, the Ohio Office of Comprehensive Health Planning published a report prepared under a special projects grant titled, "The Contribution of Non-Physician Health Workers to the Delivery of Primary Care," by Amasa B. Ford, M.D., and David P. Ransohoff. Included in the text of the summary and conclusions were the following statements: "The new movement has the potential of opening up more rewarding careers for the increasing number of workers who have been entering the health care field in recent years. --- Training programs are beginning to admit and attract new recruits in addition to the nurses and medical corpsmen with which many started. --- Obstacles to the extensive participation of nonphysician workers in primary care exist, but can be removed if the need is great enough. --- Meanwhile, existing physician and nurse licensure laws, with minor modification, can be used to protect and encourage further experimentation."

Following this report, the Committee named Robert J. Atwell, M.D., Frances E. Williamson and Monica V. Brown to study surveys conducted in Ohio and other states on this subject. An instrument was to be devised for use in Ohio with the target population being Ohio physicians — Doctors of Medicine and Doctors of Osteopathic Medicine.

In 1970, the Ohio State Medical Association conducted an "Opinion Survey" which included among its questions: "Do you favor the employment of trained 'physician assistants' to work in physicians' offices performing such tasks as, (a) preliminary screening for illness; (b) well-baby examinations; (c) family planning.

An excellent return of 5,400 replies was received on that survey, representing 55 percent of forms mailed.

Of those responding, 46 percent said "yes" and 54 percent "no" on (a); 39 percent "yes" and 61 percent "no" on (b); and 47 percent "yes" and 53 percent "no" on (c).

No other attempt has been made in Ohio to obtain additional and comprehensive information despite concern exhibited by all involved in planning for, delivery of and education for delivery of health care.

The final draft of the Ohio instrument was approved in May, 1972. The project was imple-

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INDICATIONS: In the male: 1. Eunuchoidism and eunuchism. 2. Male climacteric symptoms when these are secondary to androgen deficiency. 3. Impotence due to androgenic deficiency. 4. Postpuberal cryptorchidism with evidence of hypogonadism. Cholestatic hepatitis with jaundice and altered liver function tests, such as increased BSP retention and rises in SGOT levels, have been reported after Methyltestosterone. These changes appear to be related to dosage of the drug. Therefore, in the presence of any changes in liver function tests, drug should be discontinued.

PRECAUTIONS: Prolonged dosage of androgen may result in sodium and fluid retention. This may present a problem, especially in patients with compromised cardiac reserve or renal disease. In treating males for symptoms of climacteric, avoid stimulation to the point of increasing the nervous, mental, and physical activities beyond the patient's cardiovascular capacity.

CONTRAINDICATIONS: Contraindicated in persons with known or suspected carcinoma of the prostate and in carcinoma of the male breast. Contraindicated in the presence of severe liver damage.

WARNINGS: If priapism or other signs of excessive sexual stimulation develop, discontinue therapy. In the male, prolonged administration or excessive dosage may cause inhibition of testicular function, with resultant oligospermia and decrease in ejaculatory volume. Use cautiously in young boys to avoid premature epiphyseal closure or precocious sexual development. Hypersensitivity and gynecomastia may occur rarely. PBI may be decreased in patients taking androgens. Hypercalcemia may occur, particularly during therapy for metastatic breast carcinoma. If this occurs, the drug should be discontinued.

ADVERSE REACTIONS: Cholestatic Jaundice • Oligospermia and decreased ejaculatory volume. • Hypercalcemia particularly in patients with metastatic breast carcinoma. This usually indicates progression of bone metastases. • Sodium and water retention. • Priapism • Virilization in female patients • Hypersensitivity and gynecomastia.

DOSAGE AND ADMINISTRATION: Dosage must be strictly individualized, as patients vary widely in requirements. Daily requirements are best administered in divided doses. The following chart is suggested as an average daily dosage guide.

INDICATION	Average Daily Dosage Tablets
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Eunuchoidism and eunuchism	10 to 40 mg.
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American Medical Association

The American Medical Association has approved guidelines for the Assistant to the Primary Care Physician. Seventeen programs have been approved. National Certification of Physician's Assistants by Uniform Examinations is now under study.

Federal Support

As of October, 1972, more than \$6 million dollars in contracts and grants had been awarded to institutions in 26 states and the District of Columbia by the Bureau of Health Manpower Education, National Institutes of Health, Public Health Service, U.S. Department of Health, Education and Welfare.

Table I. House Calls and Physician Assistants

	% YES	% NO
1. Could a trained assistant—		
(a) replace you in any of your house calls	18.5	38.9
<input type="checkbox"/> DO NOT make house calls. (19.5%)		
(b) help you in any of your house calls	26.9	28.3
(c) help in emergencies	58.9	15.3
(d) help in minor surgery	55.0	15.1

Table II. How Physician Assistants Would Affect Practice

2. Please check how you feel greater use of trained non-physicians in your practice would affect —			
(a) its quality <input type="checkbox"/> Increase <input type="checkbox"/> No change <input type="checkbox"/> Decrease	28.4%	40.3%	15.2%
(b) its volume <input type="checkbox"/> Increase <input type="checkbox"/> No change <input type="checkbox"/> Decrease	52.9%	27.2%	3.5%

Table III. Possible Obstacles to Use of Nonphysician Personnel

Factors	3. Do you regard the following factors as major obstacles to greater uses of trained nonphysician personnel in medical practice?	
	% YES	% NO
Shortage of trained workers . . .	53.6	24.9
Patient non-acceptance	43.7	36.5
Impairment of Physician-Patient relationship	42.5	37.8
Higher cost	33.8	45.2
Excess time for supervision	35.9	42.2
Legal and insurance problems	69.0	13.5
Lack of office space	29.4	48.4
High worker turnover	27.5	43.6

Table IV. Future Considerations Regarding Use of Nonphysician Personnel

Graduates of —	Would you consider interviewing, with a view to employing, the following graduates and persons with other specified training?	
	% YES	% NO
Four year programs	40.3	33.0
Three year programs	35.5	35.5
Two to three year programs	34.0	37.6
Two year programs	30.4	41.1
Other persons with specified training		
Persons with extensive on-the-job training	41.4	30.3
Allied health professionals and additional training	39.6	30.4
Registered nurses with additional training	51.5	23.6
Licensed practical nurses with additional training	42.1	31.0

Legislation

Twenty-five states now have legislation of different types for physician assistants. These are: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Iowa, Kansas, Maryland, Michigan, Montana, New Hampshire, New York, North Carolina, Oklahoma, Oregon, Utah, Vermont, Washington and West Virginia. In the absence of legislation, the role of physician assistants is determined by custom and usage.

Terminology

In discussion of the recognition of the physician assistant, and, in fact, with all of the health professions, much confusion exists regarding the definition of terms. Following is a glossary com-

piled by the Department of Health, Education and Welfare which defines various methods of acceptance.

Accreditation is the process by which an agency or an organization evaluates and recognizes a program of study or an institution as meeting certain predetermined qualifications or standards. Accreditation shall apply only to institutions and programs.

Certification is the process by which a non-governmental agency or association grants recognition to an individual who has met certain predetermined qualifications specified by that agency or association.

Licensure is the process by which an agency of government grants permission to persons meeting predetermined qualifications to engage in a given occupation and/or to use a particular title, or grants permission to institutions to perform specified functions.

Registration is the process by which qualified individuals are listed on an official roster maintained by a governmental or non-governmental agency.

Qualifying examination is a criterion for measuring an individual's ability to meet a predetermined standard.

Equivalency testing is the comprehensive evaluation of knowledge acquired through alternate learning experience as a substitute for established educational requirements.

Challenge examination is equivalency testing which leads to academic credit or advanced standing in lieu of course enrollment by candidate.

Proficiency testing assesses technical knowledge and skills related to the performance requirements of a specific job; such knowledge and skills may have been acquired through formal or informal means.

The survey was conducted by mail between July 15 and September 15, 1972. The number of questionnaires mailed (less those undeliverable and returned blank) was 12,908. Of that number, 3,472 responses were received, for a 27.0 percent return. Of Ohio's 88 counties, replies were received from 86, Vinton and Wyandot being the only counties from which no replies were received.

About two-thirds of replies were received from solo practitioners, and roughly one-third from physicians in group practice. Replies were received from physicians in 34 different fields of practice, indicating a cross section of Ohio physicians by type of practice as well as geographically. E.g., 988 replies were received from general practitioners, 333 from general surgeons, 404 from internists, etc.

Many of the respondents (38.9 percent) who make house calls indicated that physician assistants could not replace them on the house call, but the respondents were evenly divided on the subject of helping on house calls (See Table I). The majority (52.9 percent) of those responding felt that a physician assistant would increase the number of patients that a physician could see, and most (68.7 percent) indicated that the quality of medicine would either increase or not change (see Table II).

When questioned about possible obstacles, most respondents listed legal and insurance programs as the biggest obstacles (see Table III).

Conclusions

In conclusion, the survey was productive in throwing light on current practices in the use of physician assistants in the broad sense of that term, but is clouded as to future practices.

It appears that Ohio physicians are about equally divided on the issues of employing physician assistants. With the possible exception of Registered Nurses, the respondents were split on employing graduates of ancillary medical personnel training programs (see Table IV).

Perhaps, if the legal and insurance questions are solved in the near future, and if training programs continue to grow as they do now, the use of nonphysicians as assistants will increase.



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X-ray dosage aid sped by computer

EAST ORANGE, N.J.—To guarantee safe, precise, and effective radiation doses, 22 hospitals in New Jersey belong to a statewide teletype network linked to the Dose Distribution Computation Service at New York's Memorial Hospital for Cancer and Allied Diseases.

Data on patients are sent to Memorial's computer, which evaluates the information and returns a treatment plan to the originating hospital.

The New Jersey Regional Medical Program's (NJRMP) Radiation Automated Dosimetry in its first year of operation has upgraded the treatment of 9,500 of the state's annual total of 26,000 new cancer patients, notes Dr. Alvin A. Florin, NJRMP coordinator.

Dr. Florin says the project "permits patients to be treated in facilities near their homes and, because the project can compute treatment plans in one fourth to one tenth the time it took in the past, more patients can be treated."

Bold New Programs Fill 'Country Doctor' Role

Playing hard as usual, 8-year-old Juan flailed his arms in a diving lunge at the thrown football. One hand came down hard against a rock hidden in the grass, and Juan yelled in pain. He had to leave the game and go home. Soon the hand began to swell, and Juan's parents worried. They put Juan in the car and took him into the nearby town for medical attention—a town that hasn't had a doctor in five years.

The town happens to be Estancia, New Mexico, where a new kind of rural health care is being practiced.

Juan's parents drove to a one-story building off the main street, where the hand was x-rayed and found to be broken. The lady in charge splinted the hand and directed Juan's parents to a hospital in another town, where a cast could be applied.

The lady was not a doctor, nor a nurse. She was a nurse-practitioner, a new type of medical worker . . .

Far to the east of Estancia, a minibus stopped on a road in the Maine woods. A woman got in, for a ride to the Rural Health Associates clinic, a "doctor's office" for not just one town, but a couple of dozen towns . . .

In Salem, Mo., a heart patient got an electrocardiogram. Within minutes, a specialist at the University of Missouri medical center, 130 miles away, was analyzing the EKG . . .

Those are three examples of areas where totally new methods of health care have replaced—or augmented—the traditional "country doctor."

Another new approach may prove to be the most widely applicable of all for doctor-short areas—satellite clinics scattered around a county and staffed by physicians from the county's primary city or town. This method is being inaugurated in Fresno County, Calif., home of Dr. Leopold J. Snyder, chairman of the Council on Rural Health of the

American Medical Association, who conceived the idea.

It is to these new approaches that rural America must look for health care, rather than waiting and hoping for a doctor to settle in their midst, Dr. Snyder says.

Why?

"Because it is obvious that many small communities that once had their own physician will never again have one," he said. "There are a number of reasons why: Economic conditions of the area, isolation from professional associates and cultural activities, plus the demands put on a single doctor when he has to serve a whole community and the surrounding area."

It is not that young physicians are not dedicated—they are, and that very fact deters them from settling in a country town, Dr. Snyder said.

"These young doctors have been brought up in an era of sophisticated medicine, sophisticated technology, communication and transportation . . . all of which can sometimes mean the difference between life and death for a patient, and they are aware of this. They want to be equipped to practice the best medicine they can."

How, then, can the wants of both rural residents and physicians be satisfied?

One answer is found in the Rural Health Associates in Farmington, Maine, a group practice headed by Dr. David C. Dixon, a 36-year-old surgeon. After he finished his residency a few years ago, he says, "I wouldn't go to a little town as the sole physician."

"The reason I and other doctors don't want to do that is a great fear of intellectual sterility, although some physicians may give other reasons—such as not wanting to be on call 24 hours a day. It's not the work—what

(Continued on Page 787)

PESTICIDE INTOXICATION

Treatment:	Atropine	2-PAM
	12:30 a. m. 4 mg IV	2:00 a. m. 1,000- mg IV
	1:30 a. m. 2 mg IV	
	2:30 a. m. 2 mg IV	
	5:30 a. m. 1 mg IV	
	10:00 a. m. .8 mg oral	
	2:00 p. m. .8 mg oral	
	Total: 10.6 mg	
Later Course:	Fully recovered.	

¹All patients exhibited symptoms similar to those described for Case No. 1; only the most pronounced symptoms are mentioned for patients 2 through 9.

Discussion

The patients showed marked recovery by 6 a. m., March 10, and were discharged from the hospital at 5:10 p. m. that day to the Mt. Meig's Medical Treatment Center for prisoners. After observation at the Center for two days, they were returned to Draper Prison and kept in the infirmary for two more days.

Of particular interest is the fact that only one of the nine prisoners had an abnormally low cholinesterase level; levels in the other eight were low but still in the normal range of cholinesterase values. It was also interesting to note that all nine showed higher than normal levels of glucose. Fortunately, none of the victims were diabetic. All the patients recovered quickly and were returned to normal duties at the prison.

Although the prisoners disclaimed any knowledge that an insecticide had been used as the masking agent, they admitted this would not have deterred them from drinking the homemade brew since they were unaware of the toxicity of insecticides to humans.

Conclusion

The inherent dangers of pesticides should be made known to all persons who may come in contact with these compounds. The incident described in this paper exemplifies the importance of physicians being familiar with

this type of poisoning and thereby avoiding fatalities through prompt diagnosis and treatment.

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A temporary, artificial vitreous for the eye is being used at several medical research centers. Vitreous is the clear gel material inside the eye which gives it shape and helps hold its parts in place. Shrinking vitreous is a major cause of retina detachment, which affects the vision of many Americans every year. The retina lines the inner wall of the eye and transmits light to the brain via the optic nerve.

(Continued from Page 782)

they are really saying is that they wouldn't be able to maintain their skills to take care of patients in the way they want to take care of them.

"But if a man is involved in a health delivery system like ours, it's a different story. Our system is on call 24 hours a day, but an individual physician is only on call every fifth night. You get days off. And you can figure on taking two weeks off for continuing medical education."

The opportunity for consultation with other physicians—whether in a group practice or with other solo practitioners—also is important, Dr. Dixon said.

"Medicine is so sophisticated now that you can take the brightest doctor in the world, and if he doesn't have constant interplay with other physicians, and a chance to get back to academic medicine now and then, the quality of his care is inevitably going to decline."

Dr. Snyder and Dr. Dixon emphasize the importance of each community or rural area designing its own health care plan. It should be done with all interested parties—doctors, business and civic leaders and consumers—discussing various wants and needs, they say.

"A program applicable in one place may not be applicable in another," Dr. Dixon said. "And there has to be somebody to take the lead."

The logical leader, added Dr. Snyder, is the local medical society, as in Fresno, where Dr. Snyder was the catalyst for action.

After "playing with the idea for 15 years and trying to sell it for 10 years," he got a \$10,000 grant from the California Medical Association to get started.

"We went out to two adjoining communities in northwest Fresno County, Firebaugh and Mendota, about 40 miles from Fresno," he said.

The health care situation there, according to a local newspaper, ranked with "the worst anywhere."

Fresno County—bigger than Rhode Island and Delaware combined—is farming country ("half the cantaloupe America eats comes from the Mendota area," Dr. Snyder said). The permanent Firebaugh-Mendota population of 15,000 is doubled by seasonal influxes of migrant workers.

Only three badly overworked doctors have been available, and the county health department has held two evening clinics a week in Firebaugh, one a general clinic and the other devoted to obstetrics, gynecology and family planning. Each session draws 80 to 90 people. Others make the long round trip to Fresno for treatment, "but since many of them don't have transportation, this means that many of them don't get health care, except in emergencies," Dr. Snyder said.

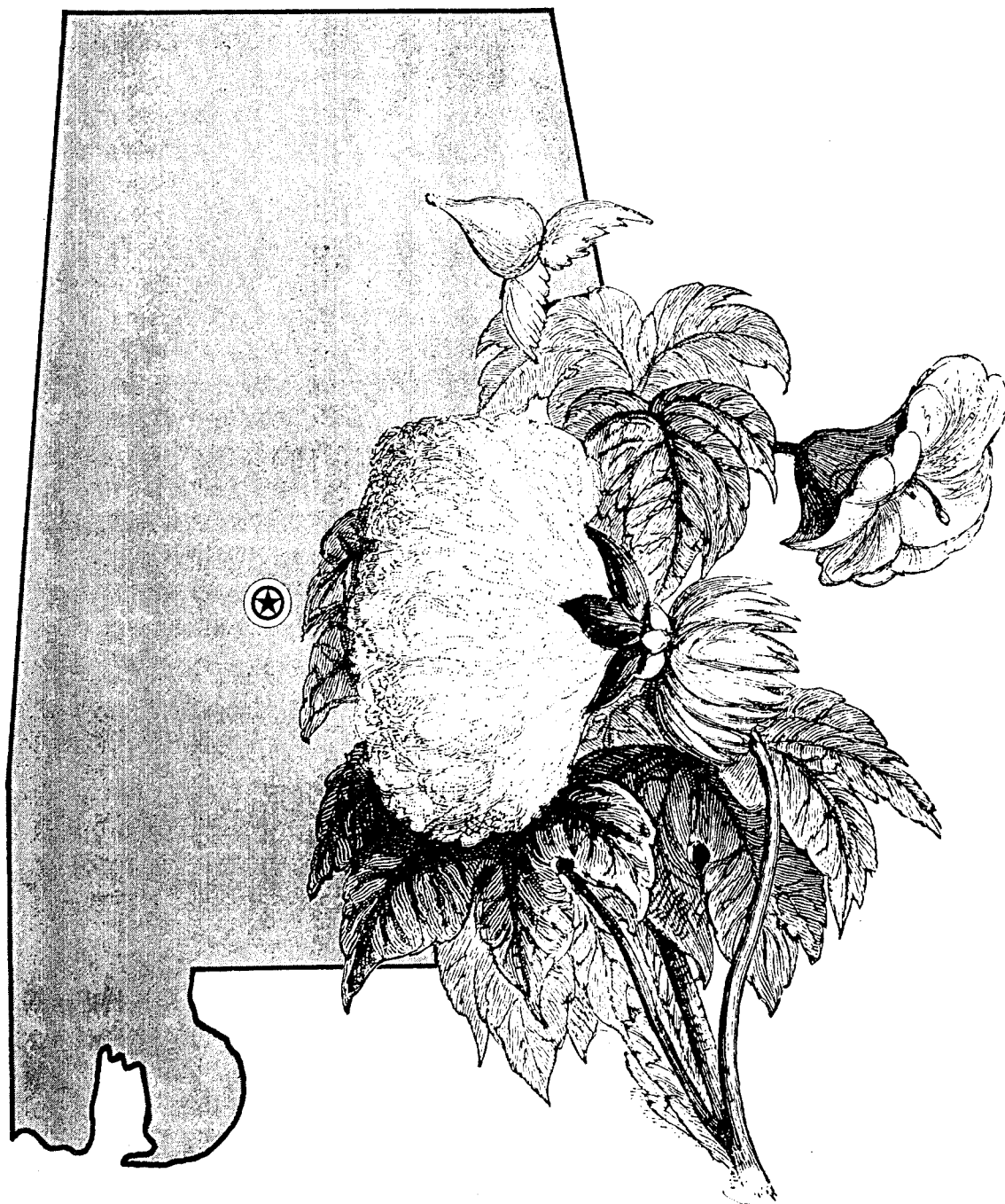
The problem was obvious. But the solution was decided only after extensive discussion with residents, to get them involved in the planning and make sure that whatever program materialized would be acceptable to them.

"All health programs should be worked out as we worked this one out, at the county level, with county people," Dr. Snyder said. People like Fidel De La Cruz, mayor of Mendota, and John Witworth, who has lived in the area almost 30 years. The views of everyone—from physicians to potential patients—were sought.

The rich, the poor, the middle class; whites, blacks and Mexican-Americans. All were asked what was needed. And their reply was: Availability of more physician and dental services; emergency service at nights and on weekends; transportation to local health facilities as well as to facilities in Fresno; health education, especially in hygiene and nutrition; social and rehabilitation services, and payment for services on

(Continued on Page 790)

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'COUNTRY DOCTOR'

(Continued from Page 787)

a sliding fee scale, based on income.

With the help of more grant money from the federal Regional Medical Program, the California Medical Association, and the communities, a comprehensive health care center will open this month (November).

It occupies a former doctor's office which was renovated by community labor, and much of the equipment has been donated by doctors and dentists. Two mobile structures, one a dental office and the other administrative headquarters, flank the center.

The medical unit will provide a full range of care, plus immunizations, health education and family planning information.

"We have close to 100 doctors from the county medical society who have said they will either help regularly staff the clinic (on a volunteer rotating basis) at the start, or come out for specialty clinics," Dr. Snyder said. However, he added, "we will try to develop a permanent staff of doctors for the center, and rely on society volunteers only for back-up purposes.

"We are arranging with the community hospital in Fresno to provide x-ray and laboratory services and we also are arranging what is probably as important as anything else—transportation."

Transportation is a special need of the rural poor, he said. "Usually a family has to wait until the father gets home from the fields with the family car, late at night. Then they will come in with a child who has been sick all day. This happens over and over again."

Now, minibuses will be used to carry patients to and from the health center and other facilities.

Dr. Snyder, a specialist in internal medicine who expects to spend one evening a week at the center, said it will not be just for poor people, but for everyone.

"The community has agreed that every-

one should receive care through one door," he said. (The same philosophy applies at the Maine clinic).

"There won't be two doors, two classes of service—only one class, the best quality. Those who can pay will pay, others won't. This is the kind of thing we would like to see all over."

Although "every area has to deal with its own problems," Dr. Snyder feels that a program such as Fresno County's should be widely applicable, with leadership or strong participation by the local medical society and other health care professionals. (One of the leading backers of the project was Dr. Tal Carter, a dentist, of neighboring Madera, who offered equipment and staffing services for the dental unit).

"You can put all the funds you want to in an area, and if the health care providers don't assume responsibility for the project, nothing is going to happen," Dr. Snyder said.

"The important thing to me is that our medical society has accepted the fact that it is responsible for the medical care of the whole county. And from that attitude we developed this program—to give everyone access to care."

Practicing physicians, he added, also have an obligation to young doctors in helping to solve the dilemma mentioned earlier—of young doctors wanting to serve rural patients but not wanting to be stuck in some isolated community. Innovative projects such as Firebaugh-Mendota and Rural Health Associates in Maine provide the answer, Dr. Snyder said.

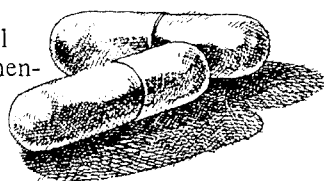
"If we are able to develop systems which will enable young people to fulfill the social commitment they feel, and yet remain with their peers and maintain their skills, then they will be able to settle in very comfortably and carry on after us," Dr. Snyder said. "The young person hardly has the knowhow or the backing to develop such a system, so

(Continued on Page 798)

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Precautions: In elderly and debilitated, limit dosage to smallest effective amount to preclude development of ataxia, oversedation or confusion (not more than two capsules per day initially; increase gradually as needed and tolerated). Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider individual pharmacologic effects, particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions (e.g., excitement, stimulation and acute rage) have been reported in psychiatric patients. Employ usual precautions

in treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation have been reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship has not been established clinically.

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(Continued from Page 790)

that is our responsibility, ~~the~~ responsibility of organized medicine."

Some of those systems will utilize physicians fulltime or only part time, and others will utilize physicians' assistants or nurses only, with physicians acting as advisors, he added.

Here is a brief look at some other programs:

—RURAL HEALTH ASSOCIATES, FARMINGTON, MAINE. Organized a year ago by Dr. Dixon and four other physicians to provide care in a doctor-short area of 1,900-square miles and 29 towns around Farmington, Maine. Physicians, business and labor leaders and consumers reviewed needs before deciding on a non-profit corporation, which was started with financial aid from the Office of Economic Opportunity.

RHA runs a central clinic in Farmington, and satellite clinics have opened or will open soon in Rangely, Jay and Kingfield. All clinics have a physician, and all will soon be linked by a television communication system, providing instant consultation. Here, as in Fresno County, the "one door" concept applies for rich and poor among the 30,000 residents served. The doctors and two dentists are unaware of who is paying and who isn't.

The medical staff also has grown, instead of losing doctors as is usually the case in rural areas. "The thing that is gratifying to me," Dr. Dixon said, "is that we have attracted three really fine physicians in just one year."

—NURSE-PRACTITIONER, ESTANCIA, NEW MEXICO. One recent morning was fairly typical for Mrs. Martha Schwebach, the nurse-practitioner at Hope Medical Center. Besides the little boy with the broken hand, she saw eight other patients, including a woman with tuberculosis and a young man with flu.

"In summer I do a lot of suturing, of cuts

and bruises," said the attractive mother of four, "but that slows down when the children go back to school."

The center was formerly occupied by a doctor. After he moved away, the town of 800 could not attract a replacement. So, with a grant from the federal Regional Medical Program, the University of New Mexico medical school trained Mrs. Schwebach, the nation's first nurse-practitioner. She was a registered nurse living in Estancia with her rancher-husband. Mrs. Schwebach got seven months of special training at the medical school, enabling her to provide "first line" care such as suturing, physical examinations, x-rays and splinting.

She does not diagnose illness but "sorts out the normal from the abnormal," and is linked by special telephone to physicians at the medical school. Doctors are always available to her. Two physicians, one a pediatrician, and a dentist also visit the center weekly. Each Wednesday morning, Mrs. Schwebach is at the medical school, conferring with doctors and collecting reading matter, all part of her continuing education.

As a new type of health professional, Mrs. Schwebach has met with enthusiastic acceptance, although patients still are a little unsure of what to call her. "Some call me nurse, some call me doctor—and some just call me Martha!" she laughed.

—AUTOMATED DEVICES. In the Ozark town of Salem, Mo., Dr. Billy Jack Bass has a unique "medical assistant"—a computer-telephone linkup with the University of Missouri medical school 130 miles away. The arrangement helps him in several ways: by connecting him with medical specialists, for consultation (he used to have to refer difficult cases to St. Louis specialists and "the trip and expenses are hard for people living on hard-scrabble farms"); by storing medical records, and by increasing the efficiency of his office.

The equipment enables a patient to get a full battery of tests in less than 3 hours,

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Antivert[®] (meclizine HCl) has been found useful in the management of vertigo associated with diseases affecting the vestibular system. It is available as Antivert (12.5 mg. meclizine HCl) and Antivert/25 (25 mg. meclizine HCl) scored tablets for convenience and flexibility of dosage. Antivert/25 (25 mg. meclizine HCl) Chewable Tablets are available for the management of nausea, vomiting, and dizziness associated with motion sickness.

*INDICATIONS. Based on a review of this drug by the National Academy of Sciences-National Research Council and/or other information, FDA has classified the indications as follows:

Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

Possibly Effective: Management of vertigo associated with diseases affecting the vestibular system.

Final classification of the less than effective indications requires further investigation.

CONTRAINDICATIONS. Administration of Antivert during pregnancy or to women who may become pregnant is contraindicated in view of the teratogenic effect of the drug in rats.

The administration of meclizine to pregnant rats during the 12th-15th day of gestation has produced cleft palate in the offspring. Limited studies using doses of over 100 mg./kg./day in rabbits and 10 mg./kg./day in pigs and monkeys did not show cleft palate. Congeners of meclizine have caused cleft palate in species other than the rat.

Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

Usage in Pregnancy: See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported.

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'COUNTRY DOCTOR'

and all data is stored on the computer for quick retrieval. Formerly, patients had to travel up to 90 miles for comparable services, and it took two or three days to run the tests and get results.

Another machine in Dr. Bass' office "interviews" patients—through audio tape, cartoons and printed questions—for their medical histories. All the devices, in use for a year and a half, have proven "100% acceptable to patients," Dr. Bass said.

The equipment was developed by the Missouri Regional Medical Program and the University of Missouri's schools of medicine and engineering. The RMP plans to extend

the experiment by setting up a no-physician satellite clinic 30 miles from Salem, linked by computer to the existing clinic.

"These few models represent a great range of situations, needs and action to meet those needs," Dr. Snyder said. "And this is because there is no one simplistic solution applicable to all areas. Each area will need to develop its own plan."

He urged interested residents of doctor-short areas to write to the American Medical Association's Department of Rural Health for informational guidelines on setting up health care systems. (AMA, 535 N. Dearborn, Chicago, Ill. 60610).

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MAY '73

May 11, 1973

Wyo. State Tribune

State Hospitals Upgrade Laboratory Performance

Dr. Lee first saw the need for such a program when he joined the health department staff five years ago, but lacked the funds to support other than a minimal testing program.

"A clinical laboratory is a vital component of a community's medical resources because of the importance of lab tests in diagnosing illness," he said. "But to really be effective, a lab and the physicians it serves must know that the tests are done properly and that the results are accurate.

"This is why a good testing program is important," he continued.

Dr. Lee explained that the CWRMP-supported project enables Wyoming hospitals and clinics to participate in a highly successful laboratory quality control program which has been sponsored for several years by the Colorado State Health Department.

Each four to six weeks a number of laboratory test preparations, including blood serums, microscope slides and bacterial specimens, are sent from the Colorado health department in Denver to Dr. Lee's lab in Cheyenne. The test samples are identical to those sent to Colorado hospitals for testing and are typical of the types of specimens routinely analyzed by clinical labs.

Walt Castle, a medical technologist in the Cheyenne lab, examines samples of the test

program. Each lab has about a week to analyze the specimens and report their findings to Castle, who in turn sends the results to Denver.

Test results from all participating hospitals in the two states are scored and compared statistically, and each lab is told how it compares with all other labs for each of the tests.

"The proficiency testing component of our project tells us which labs need help and in what areas they need assistance," Dr. Lee said. "This is where the consultation and continuing education aspects of the project come in.

"For example," he continued, "we have been able to spot laboratory equipment which has needed adjustment, repair or even replacement. And, in some instances, we have suggested that labs change their techniques for certain tests.

"We have recommended that some labs not attempt to do certain test, and we have encouraged others to expand their services," he pointed out.

"And most importantly, we have noticed a definite increase in laboratory proficiency in the state during the past year," he said. "This is especially true in the cases of some labs which showed only marginal performance when the project began."

The state's hospitals appear quite pleased with the program, which was originally designed to



WALT CASTLE, medical technologist in the Wyoming State Health Department laboratory, checks a test sample of a chemical unknown prior to sending specimens to Wyoming hospital laboratories for analysis. Watching is Dr. Donald

T. Lee, laboratory director and director of the state-wide program to upgrade clinical lab performance in the state. The program is funded by a grant from the Denver-based Colorado-Wyoming Regional Medical Program.

laboratories asked to be included.

The project, one of several sponsored by CWRMP in Colorado and Wyoming to improve the quality and delivery of health care, was originally programmed to continue through 1974 with CWRMP funding support. It was anticipated that state funds would be able to take over full support of the lab improvement program beginning in 1975.

Now, however, with the threatened phase-out of RMPs

assured only until Dec. 31, 1973.

Dr. Lee is hoping for state funds to take over project support beginning in January, 1974.

All hospital labs in the state are participating in the program, with the exception of those in Cheyenne, Casper and Sheridan, where the labs are involved in other proficiency programs.

Non-hospital labs participating include the Laboratory of Clinical Medicine, Cody; Lander Medical Clinic, Lander; Medical Arts Association, Laramie; Wind



MRS. NELL Maguire, senior microbiologist in the Colorado State Health Department's laboratory evaluation and consultation section, prepares bacteriology specimens for shipment to Wyoming hospitals participating in the laboratory improvement program. A

project grant from the Colorado-Wyoming Regional Medical Program enables hospitals in Wyoming to take part in a highly successful program sponsored for several years by the Colorado Health Department for Colorado hospitals.

About two years ago, a Wyoming public health official and a Denver microbiologist met to discuss their mutual concern for the quality of clinical laboratory services in rural Wyoming hospitals.

That meeting, and several others, led to the establishment of a state-wide laboratory improvement project which today is bringing about continuous and measurable improvements in the quality of medical laboratory work in hospitals across the state.

The ultimate goal of the project is to insure that Wyoming patients, through their physicians, have access to the best possible laboratory services throughout the state.

Headquartered at the Wyoming State Health Department laboratory in Cheyenne and funded by the Denver-based Colorado-Wyoming Regional Medical Program (CWRMP), the project was designed by Donald T. Lee, D.P.H., director of the state health laboratory, and W. C. Morse, Ph.D., a microbiologist

and associate director of CWRMP.

After less than a year of actual operation, the project seems to be well on its way to meeting its goal. Twenty-three of Wyoming's 728 hospitals are voluntarily participating in the program, as are five private clinical labs in the state.

Officially entitled "Wyoming Clinical Laboratory Improvement Program," the project is intended to help hospitals reach and maintain high performance standards through three mechanisms:

—A proficiency testing program for clinical labs in the state.

—Professional consultation to participating labs, and

—Continuing education programs for laboratory personnel.

Improved patient care is goal of local nurses

A group of Sheridan nurses are attending a course of instruction designed to improve their professional skills and make them better able to evaluate patient health-illness status.

Martha Stoner, senior instructor, coordinator for rural nursing from Colorado University Nursing School continuing education services, is in Sheridan this week conducting the course with the assistance of several area physicians and the hospital.

"The ultimate goal of this program is improved patient care," Mrs. Stoner said.

She said the program is a part of the nurses' continuing education. The instructions will enable the nurse to increase her skills and to observe the patient more accurately and in turn relate more accurately to the physician, Mrs. Stoner said.

She has given the course three times in Colorado and once in Wyoming, in Fremont County.

"This course is the first one which has included hospital-based nurses. Generally I have worked with public health nurses and nursing home nurses," Mrs. Stoner said.

She said she believes the nurse is capable of doing more

and that it is just being recognized and ways are being sought to equip the nurse with additional skills.

"We are not educating doctor substitutes — this is not the purpose — but rather we hope to increase the competence of the nursing skills," Mrs. Stoner said.

Mrs. Stoner said she believes there is a very real need for continuing education for nurses and in some states there are mandatory programs but most states have voluntary programs of continuing education.

"This program is unique in that it brings the courses to the community where nurses can participate without leaving their job or family," Mrs. Stoner said.

Several of the participants taking the course are also fulfilling their job requirements.

The program is funded by Colorado and Wyoming regional medical program and although the funds have been curtailed, Mrs. Stoner said other sources are being sought for funding.

Those taking the course are Opal Arnoux, Virginia Bowen, Mary Brayton, Lucille Byers, Vivian Harris, Mary Lou Kober, Barbara Sales, Nola Wallace and Ellen Hutt and public

health nurses Mary Jane Lord and Esther McKenzie.

In addition to those persons listed in an article last week, others helping with the course are Pat Carbone, Jim Loughery and Margaret Berry, Denver, a resource person assisting Mrs. Stoner.

Medical Program Receives

The Colorado-Wyoming Regional Medical Program (CWRMP) headquartered in Denver has received a \$750,000 phase-out grant which will keep it in operation—though with a reduced staff—until Feb. 14, 1974. Dr. Thomas Nicholas, CWRMP executive director, said the grant notice came in a telegram from Dr. Harold Margulies, director of the Regional Medical Programs Service of the U.S. Department of Health, Education and Welfare (HEW). Before news of the grant came, the CWRMP and 56 other regional medical programs had

Phase-Out Grant

been informed they would receive no further funds after June 30, because of the termination of the program and nine other health programs as a result of President Nixon's budget cuts.

STAFF CUTS

A CWRMP spokesman, J.P. Smith, said the grant will support six of nine projects originally proposed through Dec. 31, and continue 10 contract activities to completion. But about half the agency's 22 professional staff members, including two physicians, two nurses and three administrators, will be terminated beginning June 30, he added.

Smith said the six projects to be funded through the end of the year include a Wyoming program to share support and administrative services among hospitals, another Wyoming program to improve clinical laboratories, a third Wyoming program for providing physician support personnel, a Colorado program for expanded role training for nurses, a Colorado adult health care practitioner program and a regional pediatric dialysis center at the University of Colorado Medical Center.

The three projects to be terminated June 30 include a rural and urban genetic counseling and screening program, a student health program for migrants and rural poor and a program to provide radiation therapy and planning by time-sharing computer.

Smith said the decision not to fund the latter three programs was made in Washington, D.C.

He described the funding as "phase-out" money "to effect a more orderly termination of projects."

A proposal in Congress to extend the Public Health Services Act which includes the regional medical programs and nine other health programs has passed the Senate but is still awaiting House action. If passed and not vetoed by the president, the bill would extend the Public Health Services Act through June 30, 1974, during which time the act would be rewritten.

Among the bill's sponsors in the Senate was Sen. Peter Dominick, R-Colo.

NORTHEAST COLORADO

Anti-Strep Plan Praised

STERLING, Colo.—An extensive streptococcus detection and control program begun last fall in Logan, Morgan and Yuma Counties by the Northeast Colorado Health Department here has resulted in a more than 50 per cent reduction in strep

infections among the 4,500 grade-school children it serves.

More important, the program has shown it can be effective without abnormally high costs, according to the health department.

Supported by \$11,000 in grant funds from the Colorado-Wyoming Regional Medical Program and the Colorado Heart Association, the program has two goals—to reduce strep in the three counties and to test its own effectiveness.

“Even though the program has another month to run, preliminary statistics indicate that our effort has been highly successful and that both goals are being met,” said Pat W. Freeburg, laboratory director for the health department and co-director of the strep program.

Strep is a highly contagious bacterial infection which generally manifests itself as a sore throat. The rate in Colorado is among the highest in the nation, especially during the winter months.

When detected early, it easily can be treated with penicillin or other antibiotics. Untreated, it can lead to rheumatic fever, permanent heart or kidney damage and other serious conditions. School children under 12 years of age are especially susceptible to strep and its complications.

Freeburg said the best method for detecting strep is to perform frequent throat cultures for those most susceptible. However, he said the cost of doing this is prohibitive.

“We wanted to discover the optimum number of school children to culture . . . to have the best possible detection program at the lowest cost,” he said. “And, by optimum, we mean the smallest number that would allow us to effectively monitor the prevalence of strep in the schools.”

Schools in the three counties were divided into two test groups. In one group, all students received throat cultures once a month. In the other group, only 16 per cent were cultured. If a school in which 16 per cent were cultured showed an unusually high rate of strep, then all students in that school were cultured.

In the schools where all students were cultured monthly, the average percentage of positive infections declined from 20.2 per cent in October to only 6.4 per cent in March. In the schools in which 16 per cent of the students were cultured, the positive percentage dropped from 19 per cent in October to 9.2 per cent in March.

Freeburg said the program could become a model for other detection and control efforts across the country, particularly in areas of high strep rates where health officials are sampling large numbers of students.

The program will be continued next year in Logan County with funding from the RE-1 Valley School Board. School officials in the other counties haven't decided whether to continue.