

THE BEER SHEVA EXPERIMENT

Edited by

S. Glick/ L. Naggan/ M. Prywes

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THE BEER SHEVA EXPERIMENT

An Interim Assessment

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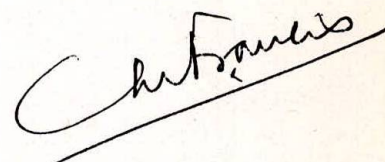
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THE BEER SHEVA EXPERIMENT: AN INTERIM ASSESSMENT

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PREFACE

Thirteen years of age is the age of transition at which, by Jewish tradition, a young man celebrates his *Bar Mitzvah** and enters into adulthood. So too in 1987, 13 years after the Ben-Gurion University Center for Health Sciences and Services opened its doors in 1974, its first graduates have begun to complete their various residency programs and reach professional maturity. This juncture represents an ideal opportunity for a review and critical assessment of the accomplishment in what has become widely known as the "Beer Sheva Experiment." Indeed we are in the process of such a detailed detailed evaluation (pages 1093-1101 in this issue).

The present volume is an attempt to bring together over 30 articles describing various facets of our program. The institution has attracted enormous interest over the years, has been visited by hundreds of distinguished scientists and educators from all over the world, and has been repeatedly reviewed by different experts, agencies and groups. We are subjected to many inquiries about one or another aspect of our program, and the present volume is a partial attempt to share our experience with others. We make no claim for comprehensiveness in the present volume as not all areas of our activities are described. In some cases, the failure is simply because we have not made major innovations worthy of note. Thus, we have only a small section on research, but not because we consider it unimportant. On the contrary, we feel it is essential, and almost from the very start we have offered many small research grants to students to stimulate such efforts. But the scope and magnitude of our research effort is not unique and so we have not devoted much space to it. Other areas may not be discussed for technical reasons—we found no one to describe them well. Nevertheless, most areas in which we have demonstrated some creativity and feel that there may be a useful message beyond the confines of Beer Sheva are included.

The articles vary in their length, scope and depth, depending on the inclination of the authors. Some are self-critical, others more optimistic, some scholarly and perhaps even pedantic, and others more narrative in nature, each reflecting different personalities and outlooks. We hope that they will all, individually and collectively, convey a common thread of commitment, enthusiasm and devotion to major educational goals, which we hope have borne fruit.

We should like to take this opportunity to express our appreciation as Dean and former Deans of this institution, to our professional, administrative and technical staff, who have made Ben-Gurion University their labor of love. They have carried work loads well beyond accepted norms, and have had to adapt constantly to the stresses of ever-changing demands upon them. All that we have achieved is the result of their enthusiasm, persistence and devotion.

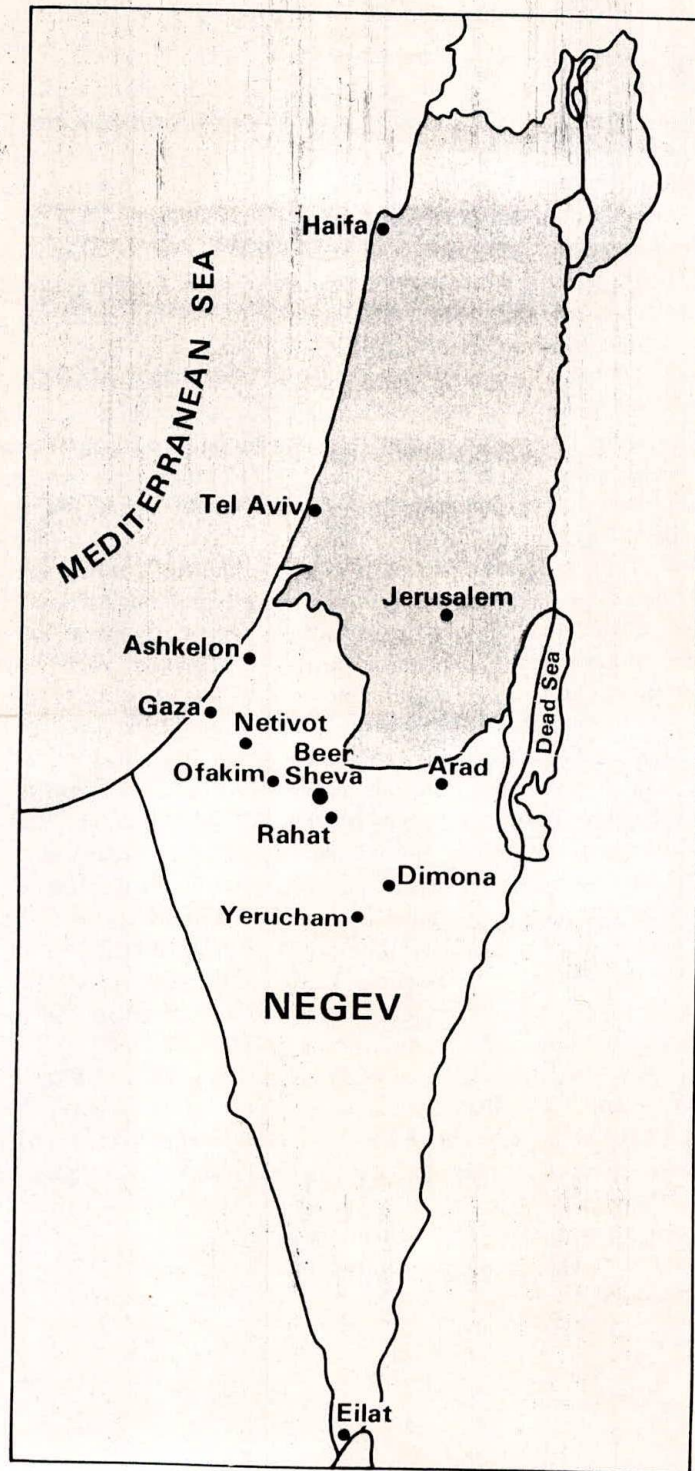
The students in particular have made the endeavor worthwhile, and have been a constant source of stimulation, usually most constructive—albeit occasionally abrasive. They have kept us honest, prevented backsliding and been true partners in every sense of the word. In addition, it is worth noting that seven of our authors in this volume are graduates of our medical school.

Finally this issue bears the unmistakable imprint of Caroline Simon whose indefatigable efforts to get this issue typed represent only a fraction of her devoted efforts on behalf of the Center in diverse ways.

Thanks are also due to the staff of the ISRAEL JOURNAL OF MEDICAL SCIENCES whose labor of love enabled them to work under difficult time constraints, tolerate our shortcomings, and manage to publish the Journal within our stated deadline.

Shimon Glick
Lechaim Naggan
Moshe Prywes

* *Bar Mitzvah*—religious rite accompanied by celebration to signify a young man's passage into adulthood with assumption of personal responsibility for fulfillment of *mitzvot*, ethical and ritual duties enjoined by the Jewish religion.



INTRODUCTION

CONTEXT AND PURPOSE OF THE VOLUME

The Beer Sheva Experiment: an Assessment of the First 13 Years

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Key Words: Beer Sheva Experiment; medical education; assessment

Confronted with a problem of atavistic racial hatred among his crew members, the space ship's captain consults with the ship's doctor, since "Israelis are good at sensing that sort of thing." The doctor's name was Yitzhak Villin. He was an Israeli, a graduate of the new medical school at Beer Sheva.

From "Holdout," by Robert Sheckley. *Fantasy and Science Fiction*, December 1957, p 292.

Mrs. Sheckley, the source of any "Jewish" elements in her husband's science fiction stories, told us in 1977 that she had no recollection of how the imaginative element arose when the book was written in 1957. But surely, no one else at that time entertained the idea of a medical school in Beer Sheva. It was strictly in the realm of science fiction then and for a decade to come. Not until publication of the Gillis report in September 1969 by the committee planning the University of the Negev is reference found: "in due course of time, there will be a need to establish a school of medicine in the Negev, based on the Central Negev Hospital." Thereafter, matters moved rapidly. In February 1970, at the initiative of the Rector of the University, Haim Hanani, and the Medical Director of Kupat Holim (Health Insurance Institution of the General Federation of Labor), Haim Doron, the Kleeman Committee was constituted. Its report, submitted in May 1970, served as the first draft of the proposal ultimately submitted formally by the University to

the Council on Higher Education of the Government of Israel.

The Kleeman report noted some of the particularistic features of this medical school about to be born: the special health care needs of the Negev; the "growing difficulty in providing high-quality medical care in the local and regional clinics, particularly in the outlying communities"; the "need to integrate the ambulatory care and hospital-based services"; and the "possibility of a co-operative arrangement between the University of the Negev and Kupat Holim." But the full ideological-conceptual clarification received concrete embodiment only in February 1972, when Moshe Prywes, the long-time Associate Dean at the Hebrew University-Hadassah School of Medicine, was asked to chair the Committee to Plan the Establishment of the Center for Health Sciences in the Negev. Dr. Prywes' paper, which opens this volume, sets forth the basic concepts that emerged from the deliberations of the Committee he headed, and which provided the spirit and paradigm of the medical school, as described in this volume.

The Feldman Committee, established by the Council on Higher Education*, considered the

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* The bulk of university budgets in Israel is provided by the Government, which set up the Council to make formal recommendations (in practice, decisions) concerning university requests to establish a degree-granting department or program, since these always have financial and educational policy implications. The Council, chaired by the Minister of Education and Culture, is comprised of individuals appointed from universities and cultural institutions as well as from public life. A specific request is first considered by a committee of the Council, which in this case was headed by Michael Feldman, one of the leading scientists at the Weizmann Institute of Science, Rehovot.

detailed proposal of the Prywes Committee. Its positive recommendation to the Council, submitted in October 1972, specified that "the supply and demand forecast of physicians for the next 10 years indicated that no more physicians than will be available are needed. Hence *quantitatively*, there is no need to increase the number of medical students in the country." Its recommendation was based on the core premise of the Prywes proposal: "...a different quality of physician: the education of physicians different from those educated today in the country...a new medical school whose establishment will be integrally related from its inception to a substantive and basic transformation of the structure of medicine in the Negev." Feldman and his colleagues were sceptical; high-sounding promises had been made before. They were, however, evidently persuaded that the goal was so important and that both the objective conditions in the Negev and all the persons involved—at the University, in Kupat Holim (particularly Haim Doron, the director), and a growing number of people in Israel and abroad who expressed interest, enthusiasm and commitment—augured well.

The Feldman Committee report to the Council was adopted in March 1973 after fierce debate not devoid of vested interests. The Israeli cabinet, from all reports more enthusiastic than the Council, placed its final stamp of approval on the proposal to set up what came to be known as the regional University Center for Health Sciences and Services (UCHSS) in the Negev. The onus to transform words into deeds now lay on Moshe Prywes, on Haim Doron, on their colleagues serving in the Negev and on newcomers attracted to the new institution, and—to anticipate an important theme of this volume—on the students, the first 34 of whom started their studies in August 1974. Would the new medical school in Beer Sheva rapidly become a replica of its very respectable but traditional predecessors in Jerusalem, Tel Aviv and Haifa, or would it fulfill its promises?

THE NEGEV

The Negev, then, was to be the site for this experiment. The Negev is a semi-arid district in the south of Israel, comprising 67.9% of its land mass. In Zionist ideology at the time, particularly as expressed repeatedly by David Ben-Gurion and symbolized by his own settling in Kibbutz Sde Boker on retirement from active politics, the Negev was the future of Israel, much as the West had been in American history. But in 1973, no more than 11.6% (385,000 persons) of the Israeli population lived in the Negev.

Administratively, the Southern District of Israel was divided into the smaller but more densely settled (132.3 persons/km²) Ashkelon subdistrict and the vast (by Israeli terms) Beer Sheva subdistrict (16.9 persons/km²). Table 1 gives a sense of the population distribution in the district. The Negev consisted of substantially smaller communities than those of the rest of Israel. Even its capital, Beer Sheva, located in the center of the northern Negev, was relatively provincial. Distances between communities were far greater than elsewhere in Israel.

Health services in the Negev

Health services in Israel are overwhelmingly institutionalized, and private practice is marginal. As part of the heritage of the British Mandate (1917-48), ambulatory and hospital services are sharply divided. Most of the former are provided in primary care neighborhood clinics or regional clinics with specialized services, though hospitals also provide specialized outpatient services. The great majority of the 9,143 licensed physicians in 1973 (362 persons per doctor) were employed either in a neighborhood health center or a hospital, or were responsible for providing medical services in rural communities. The other crucial datum relevant at this point is that the average Israeli, as an outpatient, saw a physician no fewer than 10 times/year—a visit rate far higher than anywhere else in the world.

A few Israelis, largely of higher income, choose to pay privately for medical services. Over 95%, however, obtain near-total coverage by membership in one of the five (in 1973) health insurance organizations. Kupat Holim means "sick fund" and can refer to any one of the five organizations. In practice, however, when an Israeli says Kupat Holim, reference is to the sick fund of the General Federation of Labor. Health insurance coverage is

Table 1. Population of the Negev by administrative status 1973

Status	Population	% of Negev population	Population range
Beer Sheva (city)	90,400	23.4	—
5 other cities	155,600	40.3	13,000-45,000
7 municipal councils	46,900	12.2	2,000-9,000
13 regional councils	60,200	15.6	800-9,000
91 moshavim	35,500*	—	—
56 kibbutzim	17,600*	—	—
16 villages or institutions	7,100*	—	—
Bedouin tribes	32,600	8.5	—
Total	385,700	100.0	—

* This number is included in the population of the 13 regional councils.

one of the benefits of trade union membership; nonunion members are also covered by Kupat Holim, through contract with organizations, (e.g., as self-employed individuals) or with government, (e.g., welfare cases and Bedouins). In 1973, 21.6% of the Israeli population were covered by one of the four smaller organizations. Almost all others (~ 75%) received medical services from Kupat Holim. Moreover, none of the four directly provide inpatient services, whereas Kupat Holim has 14 hospitals (general, psychiatric, and geriatric).

In 1973, there were 26,117 beds in 157 hospitals in Israel (1 bed/7.87 people). With the exception of a few small proprietary hospitals, largely for the chronically ill aged, Israeli hospitals are publicly owned and nonprofit. In 1972, 28.4% of all general hospital beds were in Kupat Holim general hospitals.

Kupat Holim was by far the single most important deliverer of health services nationally, and it has an almost total monopoly on health service delivery in the Negev, particularly in the Beer Sheva subdistrict. This fact is crucial to understanding the Beer Sheva Experiment. Well over 90% of the subdistrict population received health services through Kupat Holim. The 653-bed (now ~ 800) Soroka Medical Center in Beer Sheva and the 64-bed Yoseftal Hospital in Eilat—both Kupat Holim owned—were the only hospitals in the Negev. The Negev residents, then, almost without exception, saw their family doctor in a Kupat Holim neighborhood primary care clinic (or in rural areas, when the Kupat Holim doctor visited the community in which a Kupat Holim nurse was on daily duty); saw a specialist either at the hospital or at a Kupat Holim regional clinic or hospital outpatient clinic; and were hospitalized at a Kupat Holim hospital. It should be noted that Kupat Holim in most of the Negev (except Eilat) administered its hospital services via a self-contained administrative structure separate from its ambulatory services.

The enthusiastic support of Kupat Holim for the creation of the UCHSS was therefore crucial, and the formal agreement that was later signed between Ben-Gurion University and Kupat Holim has since then been the basis for all constitutional and organizational development of the UCHSS. This agreement is a unique document signed between a health maintenance organization and an academic institution.

But this was not the total picture. The Negev region of Kupat Holim was not coextensive with government administrative boundaries. Part of the Ashkelon subdistrict belonged to a different region of Kupat Holim, and the 311-bed Barzilai Hospital

in Ashkelon was owned by the Ministry of Health. Mental health services in the Negev were provided by two small Kupat Holim and Ministry of Health outpatient units until 1977, when the Ministry's Center for Mental Health in Beer Sheva, including a hospital with 180 beds, was opened.

Public health and preventive services in the Negev, as throughout Israel, are the responsibility of the Ministry of Health. By far the major focus of activity of the Ministry's regional office was what is still most often known in Israel as "*Tipat Halav*" (literally, a drop of milk)—a network of Maternal and Child Health clinics. Ministry nurses were also responsible for school health and for chronically ill patients in the community. The regional office also had a sanitation unit and a public health laboratory, a mental health center, a child development station and an epidemiology unit. In addition, the office provided some curative and preventive services for the Bedouins in the Negev.

Kupat Holim did, however, provide preventive and child health services for all kibbutzim and some other rural settlements in the region. Further, its Department of Occupational Medicine was responsible for problems of occupational health and industrial medicine, on the individual and plant levels, in the Negev, where a fair number of heavy industries are located.

Thus the context in which the Beer Sheva Experiment was to take place comprised: 1) near-total health service coverage provided overwhelmingly by Kupat Holim; 2) a strong structural separation of ambulatory from hospital services; 3) a conceptual distinction, expressed structurally, between preventive and curative services (in practice, between the Ministry of Health and Kupat Holim); and 4) a distinction between physical and mental health.

The one major additional component was a very young university, committed to science and knowledge, but with an expressed strong commitment to service in the region, which it saw as the heart of the future of Israel.

PURPOSE OF THIS VOLUME

In the fall of 1986, the 13th class of the Ben-Gurion UCHSS embarked on its studies.* At the same ceremony, members of the 6th class were awarded

* North American readers should note that the UCHSS, as almost all schools outside the United States and Canada, has a 6-year curriculum. Entering students have completed secondary school. Starting with the 5th class, we have accepted 50 students. Ten of them are army reserve students, aged 18; all the others are over the age of 20, and almost all, men and women alike, have completed army service.

the MD [one of the symbolic innovations of the school is a true commencement ceremony: the entering class is asked to avow the Israeli physician's oath (composed by the late Israeli physician and scholar Dr. Halperin) at the same time that the graduating class is given the right to practice medicine]. The 13th or *Bar Mitzvah* (confirmation) year is a good point to take stock. Indeed, recent years have seen various seminars and symposia devoted to stocktaking. There is little doubt that the subjective motivation of the editors and contributors is one of self-assessment.

But this volume appears as a special issue of a scientific journal with worldwide circulation. We are acutely aware of the fact that we are not our own audience. Our planning has been guided by the consciousness that the volume is legitimate and significant only if it speaks to our colleagues the world over. We see them as located in a series of concentric circles. First, there are those who, for professional and personal reasons, have taken a particular interest in the Beer Sheva medical school and who, for the most part, have had some personal contact with the school. Second, there are the colleagues who are fellow experimenters, organized in 1979 into the Network of Community-Oriented Educational Institutions for Health Sciences of which the Ben-Gurion University, in collaboration with WHO, was a founding member. The third circle would include colleagues in institutions that are consciously concerned with the inadequacies of medical education, and its relation to the delivery of health services, as we move toward the close of the century. And finally, there are many individuals deeply involved in medical education and health service delivery who are not only disturbed by the deficiencies, but are also disturbed by the relative complacency and conservatism of their own institutions.

The image of concentric circles should not mislead. We address ourselves equally to one who has been a guest lecturer at Beer Sheva as to one who feels himself or herself isolated in a strongly traditional medical school, and who may not even have heard of Beer Sheva. But we would go further; because medicine is both a scientific and humanistic profession, we should like to think that even those who are unshaken in their pride in medical education today will be open to a serious consideration of the issues raised in this volume. So much for our intended audience, from whom we expect the same critical and sceptical, though open-minded, attitude and judgmental criteria that are extended to any professional communication. We turn now to the intended contents of this com-

munication, which in turn will explain its structure.

It would have been pleasing had we been able to present a series of research papers, using strict scientific canons, with sound data to evaluate the Beer Sheva Experiment. Several such papers have indeed been published, and others are under way, focusing on one issue or another. But for the most part, many of the appropriate studies have not yet been done, and may never be. Alternatively, a historical case study analysis might have been appropriate. We would be delighted were this to be undertaken in the near future.

What we do have in this volume is, in a sense, the outcome of applying one of the cardinal principles of medical education as it is conducted in Beer Sheva: the specification and clarification of a problem, and the presentation of the solution which has been adopted in Beer Sheva, concluded by a tentative evaluation of the adequacy of that solution. Obviously, the Beer Sheva Experiment is not an ideal experiment in that there has not been a variety of experimental treatments and controls except for "historical" controls. The creation of an entire medical school does not lend itself readily to a rigorous comparison with an identically matched control.

This volume is intended as a presentation of concrete issues that we in Beer Sheva have defined as highly germane to medical education and health service delivery. These issues confront every reader of the ISRAEL JOURNAL OF MEDICAL SCIENCES; some default by ignoring or denying the issue, others have proposed answers that differ considerably from those adopted in Beer Sheva, and still others have gone in directions similar to ours. We hope that by providing a clear presentation of each problem, a comprehensive analysis of the reasoning underlying the solution adopted, and a relatively objective evaluation of the outcome, each paper in this volume will contribute constructively to the intellectual ferment we regard as essential today, perhaps more than ever, in the realm of medical education.

Two further comments are in order. On the one hand, we have intentionally excluded from this volume the fair number of questions that are not particularly controversial or to the resolution of which the UCHSS has nothing particularly new or exciting to say. A catalog of the school's courses is not of major interest. On the other hand, there is a danger of losing sight of the forest by concentrating on the trees. The issues identified and the solutions adopted are not isolated particles. They derive from an overall, hopefully integrated, action-directed philosophy. It would be painfully wearisome to the reader had each author explicitly linked the issue

discussed to the overall concept. We ask the reader to create the link. In fact, failure to perceive the link would indeed suggest that the terms in which the question was conceived and the solution adopted were *ad hoc*—in itself an expression of failure.

STRUCTURE AND CONTENTS

Moshe Prywes would be the first to assert that the Beer Sheva Experiment is a collective enterprise. But there is no doubt that he is *primus inter pares*. He first fully formulated the guiding ideology and the educational organizational principles that flow from it; his will, skills and reputation were crucial in transforming theory into practice; he gave up the presidency of the University to devote himself to being the founding Dean of the Faculty and Director of Health Services in the Negev; his spirit touched all of us, faculty and students, in time of crisis; and his name is near-synonymous with Beer Sheva throughout the world. What should be added is that Dr. Prywes came to Beer Sheva after two decades of serving as Associate Dean (elected deans serve for 3-year terms) of the Hebrew University-Hadassah Medical School in Jerusalem, years devoted to building a medical school in the best tradition of establishment medicine. This is not the place to discuss this revolutionary transformation. But it is relevant to note that Dr. Prywes had come to Jerusalem after serving during the years following World War II as the medical director of the Union-Ose, the medical arm of the American Joint Distribution Committee, which was responsible for rebuilding the health services of the Jewish communities in Europe and North Africa.

Haim Doron, Chairman and Medical Director of Kupat Holim, was Moshe Prywes's partner in the creation of the UCHSS. Without the full cooperation and financial and moral support of Kupat Holim, the full "merging of medical education and medical care" could not have become a reality. He considers as unique the relationship between Kupat Holim, "its" medical school, and the grove of academe, Ben-Gurion University of the Negev, within which the medical school is located.

Dr. Prywes's paper opens this volume. He specifies the core issues confronting Israeli medical education and health service delivery as we move toward the last quarter of the century, issues largely shared though not often confronted throughout the Western world of modern scientific medicine. His analysis, presenting the perspective that guided the faculty when it opened its doors, focuses on the "anatomy of change," leading consequently to the emerging concept of coexistence between the diversifying and increasingly fragmented parts in

modern medicine. The idea is to bring together into a more harmonious relationship the often juxtaposed elements of which medicine is composed today. The molding of this coexistence may be considered as the basic "credo" of Beer Sheva, demonstrating how far-going changes may flourish out of a linkage between the systems of medical education and medical care.

Dr. Prywes's paper sets the stage for everything that follows. But before turning to detailed issues, we thought it appropriate to provide, as a touchstone, the statement adopted at the meeting in Arad 2 days before the outbreak of the Yom Kippur War in October 1973. I am referring to a special task force whose assignment was the formulation, in succinct and behavioral terms, of the educational and institutional objectives of the medical school soon to be opened. The date is important, for it reminds the reader that the school was not opened after years of careful planning, recruitment, acquisition of buildings and accumulation of resources. It was during the period between the Arad meeting, held in the lovely but isolated town from which one looks out at the Negev wilderness towards Massada, and the opening of the summer course of 1974, that Israel experienced the profound trauma of the Yom Kippur War and its aftermath.

The volume is essentially divided into two parts—Educational Issues and Health Services. In the first half of Educational Issues, consideration is given to a variety of problems that are intermediate between the overall ideology and its application to specific substantive matters. Thus, for example, Ascher Segall, the key architect of the curriculum and for many years Associate Dean for Education, discusses together with his colleagues Dan Benor and Oded Susskind some of the code words soon learned by (and soon generating anxiety in) new students, such as spiral, vertical and horizontal integration, the clinician as consumer, interdisciplinary planning, the natural history of disease, etc. The first author (A.A.), Chairman of the Student Admissions Committee, which bore the responsibility for accepting the first nine classes, analyzes the strategy, tactics and consequences of a procedure that varies radically from that adopted in most medical schools throughout the world. Dan Benor, Vice Dean for Educational Development, considers the problems that emerge when teachers are asked to be learning facilitators and to teach in ways that are considerably different to the way in which they themselves had been taught and had been used to teaching. Shimon Moses, the first Chairman of the Division of Pediatrics, discusses the role of research in a faculty committed to both maintaining

high academic standards and to heavy involvement of teachers in a complex curriculum as well as in transforming the delivery of health services.

Section III then focuses on substantive matters in education. Again, we remind the reader that we have intentionally omitted presentation of many matters that are "unexciting"—not because they are unimportant, but because Beer Sheva has nothing particularly new to say either in formulation of the issue or in proposing an answer. The chapters included are designed to meet this criterion, at least in part. That is, no contention is made that Beer Sheva was committed to change for the sake of change, that what is done elsewhere is invariably inadequate, that we have not had a great deal to learn from the experience of others. Thus, for example, the chapter by Shimon Weitzman, Chairman of the Epidemiology Unit, points to no major transformation in the content and methods of teaching epidemiology. His focus, rather, is on the relatively rare integration, and not just inclusion, of the approach, concepts and tools of epidemiology into the curriculum of a medical school. Carmi Margolis, Chairman of the Division of Health in the Community, goes beyond the discussion of the relatively prominent place of the primary care clerkship, and points to the aspiration, not necessarily realized, of primary care principles being applied in the early clinical training and the other clinical clerkships. The second author (S.G.), first Chairman of the Division of Internal Medicine and present Dean, concludes Section III with a *mea culpa*: he considers those subject matters to which we, whatever the theoretical commitment, have given minimal, if any, attention.

Implied throughout this introductory paper, though not stated specifically, is that the UCHSS from its inception was seen as a means towards improving the level of health of the Negev population. We have, as yet, no way of knowing to what extent this end has been achieved. One of the early profound lessons our students learn is the complexity of the chain "medical education... health services... level of health," and that many other factors, in addition to the crucial component of formal health services, influence the level of health. Section IV of this volume, then, is devoted to a consideration of what has happened in these 13 years to the health services in the Negev, and how the changes are linked to the school.

Again, we give only a few examples of the subjects in Section IV. It opens with a paper by Lechaim Naggan, second Dean and Director of Health Services, whose training as an epidemiologist (a clue

to the Beer Sheva Experiment: few schools of medicine have epidemiologists as deans) is germane to an attempt at global assessment of what we have defined as the "\$64,000 question"—Has the quality of health care in the Negev improved? Yair Shapiro, former Director of the Soroka Medical Center, considers the extent to which the barriers between hospital-based specialties and ambulatory care have been affected. David Singer, Administrative Director of the UCHSS, focuses on the work of the committee whose responsibility it was to try and restructure the services in the Negev, so that the training of the Beer Sheva graduate could be translated into practice. As a final example of the papers in this section, we cite that by Benjamin Maoz, the second Chairman of the Division of Psychiatry and Mental Health; he discusses the relation between psychiatry and other medical services, the former often being ignored, particularly in primary care.

Partial success, failure, and success are the respective themes of three stories of experiments in development towns, as told by: 1) Rafi Boehm, an internist who took the revolutionary step of integrating his work in the hospital with primary care service in one of the most neglected towns in Israel; 2) Basil Porter, a pediatrician who sought to eliminate the distinction between sick and healthy children and the separate services designed for them; and 3) Doron Hermoni and David Mankouta, Beer Sheva graduates who, working in a primary care clinic, became enthusiastic about the idea that people from the community can be trained to be effective health educators.

We have sought in this section to do no more than give a flavor of what the volume contains. As is evident, it moves from the global to the principled to the detailed. It is only fitting, we thought, that the volume close with the two papers in Section V. First, Moshe Prywes and Miriam Friedman, research associate of the Center for Medical Education, profile the 132 Beer Sheva graduates to date. Finally, Moshe Prywes looks back at his dream and ours, in as sober an attempt as possible to make an interim evaluation. And, as those of us who know Moshe Prywes would expect, he also looks forward, guided by the Saying of the Fathers: "Yours is not to finish the labor, but neither are you free to desist from it."

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COEXISTENCE: THE RATIONALE OF THE BEERSHEVA EXPERIMENT

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Medical education is not an aim in itself. It is a mission-oriented endeavor that can be judged only by its contribution to society, mainly through improving a nation's health and developing new models of medical care. However, the two systems—medical education and medical care—are moved by different ideologies and too often turn in separate orbits.

In view of the deep involvement of medical education in the ever-growing needs and demands of a changing society, it appears inevitable that the academic medical center will bring the two systems into a more harmonious coexistence. This involvement will increasingly impose on medical schools the responsibility of searching for new models of health care delivery in addition to their traditional roles of expert clinical performance and developing new models of molecular biology. Academic medicine too often complains that it has not been given the opportunity to regulate or the responsibility to direct health care delivery systems outside its own sphere. Actually, only seldom has it tried to assume this responsibility, and often has turned its back on such opportunities when they presented themselves. Medical academicians have preferred to remain within the comfortable microenvironment of their university hospital and research laboratories.

If the academic medical community would fight for the privilege of molding medical care delivery systems with the same strength and vigor it has traditionally employed in defending its research and

teaching privileges, a balance might be found, not only between medicine and science, but between medicine and society as well. If, however, the academic medical community continues to disregard society's demand for better, cheaper, and more easily accessible health care, and if it does not educate health care professionals who are aware of their community role, medical education will not fulfill its objectives and will retreat into a no-man's-land.

Israel, although fortunate in having well-developed health services with direct and free accessibility for all, one of the world's highest ratio of physicians to population and four medical schools for a population of some four million, has not escaped the common pitfalls in the delivery of health care. Its health services today are split into three areas, each with its own facets: 1) between government, health insurance, and public and voluntary institutions; 2) between highly specialized hospitals and primary care facilities in the community, and 3) between the system of health care delivery and the academic institutions of medical education.

Fragmentation has become a common trait of our times. The universe is split and we discovered space; the five continents of the globe have been divided into a multitude of new nations, some of which are not even monolithic; society is split into a plethora of political parties and systems; the four leading religions not only differentiate between themselves but are also fragmented within themselves; families are losing their cohesiveness, and we face a growing disruption of family life. Arts and music, technology and science, education and culture—none escaped the process of differentiation. An additional look at both contemporary health systems and health sci-

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ces educational institutions reveals an amazing conglomeration of split elements: We face a mosaic of dispersed health agencies, institutions, departments, units, disciplines—each encircled by a hard shell and living a separate life, with its own jargon not understandable to those that were once its bed-fellows. The health arena is full of conflicts, many of which contribute to the paradoxical reality of confusion in the current period of great crisis in the world health system. This in turn calls for safeguards to preserve the essential nature of medicine as a science and an art. In this context, and aware of medicine's humane and social obligations, the Beer Sheva Experiment emerged as an effort to restore coexistence between the dispersed elements. The linkage between the systems of medical education and medical care became the cornerstone of the new institution.

It is impossible to change the education of physicians until the health care delivery system in which they work is changed. Therefore, the Beer Sheva Experiment has been conceived to respond to the double challenge of: 1) joining all health care services in the region onto one integrated system in order to provide comprehensive medical care for the entire population through better use of organizational, financial, and manpower resources, and 2) merging this system with the academic responsibility for medical education by attempting to educate physicians and other health workers who are aware of the system's needs and who wish to work in community hospitals and primary care clinics.

LINKAGE OF MEDICAL EDUCATION AND MEDICAL CARE

Rarely has an academic institution with responsibilities in health manpower training participated in the planning and implementation of all levels of health services for an entire region. This has been the intent in Beer Sheva. There is an implication here of mutual benefit: the potential impact of the academic community on the quality of health services through direct involvement can improve the health care system. Concurrently, health manpower training, anchored in all facets of health care delivery for the community, makes instruction more relevant since instructional objectives are derived from the real world of professional practice. This interface between health manpower education and health care enables the educational process to both stimulate and reflect changes in the patterns of health services. Both challenges can be met only through their synthesis within one integrated institution, under one administrative authority with equal responsibility for both the functions of health care services and

medical education. Thus, no true changes in the system of medical education is possible until the medical school accepts responsibility for the provision of medical services within its geographic region. This acceptance appears to be feasible only when the objectives are incorporated equally within one regional center for health sciences.

The University Center for Health Sciences (UCHS) in Beer Sheva provides a unique model for studying the deployment of academic resources in the development of an integrated health care system. In addition to the preparation of qualified manpower, members of the UCHS actively participate in the planning and implementation of all levels of health care for an entire region. To achieve the goal of integrated health care, a regional consortium was established and granted a charter. It consisted originally of the health-related agencies operating in the Negev—Kupat Holim (KH) (Health Insurance Institution of the General Federation of Labor), the Ministry of Health, and the Ben-Gurion University of the Negev. Its purpose is to ensure effective communication among the various agencies and to provide a regional framework for the coordination, administration, and sharing of resources. The Dean of the UCHS of the Ben-Gurion University of the Negev serves as the Director of the health services and chairman of the regional health authority. Recently, an important Jewish welfare agency (Joint-Israel) joined the consortium, making community health care more comprehensive by adding the dimension of social welfare and consumer participation.

A network of model primary care clinics is gradually becoming a community-based counterpart to the clinical facilities of the teaching hospital. The scope of the clinics extends beyond the provision of curative services, which was their main function in the past. Greater emphasis is now placed on prevention, on the continuity of care throughout the various phases of illness, and on outreach programs to meet those needs of the community that are less than effectively served within the confines of traditional health care. The slogan of the Center is "All who serve teach and all who teach serve," and the staff employed by the health services and the educational system are becoming accustomed to the collaborative nature of their functions. Academic titles are granted to primary care physicians and community nurses. Thus, real partnership has evolved through appointing staff with joint academic and service responsibilities and introducing an appropriate reward system. Identification with the precept that health care should respond to community needs is being encouraged as a means of cultivating profes-

sional pride in community health work. Of the first batch of 30 graduates in medicine, 21 volunteered to serve for at least 1 year in a primary care clinic before starting residency training and, in 1981, 18 of those decided to work in clinics in the Negev. In all, 59 of the 135 graduates of the first four classes followed this pattern achieving more in 4 years by their participation than was achieved in the 7 years prior to 1980.

The Dean of the Center realizes (as did the deans before him) that his dual function is Dean of the health sciences faculty and head of the health services, the latter constituting the main source of power. Many of the problems that confront the medical school of the Ben-Gurion University of the Negev resemble those encountered in medical schools in other parts of the world. The experience at Beer Sheva demonstrates that effective cooperation between the health and educational systems may be difficult but is possible (1).

While generalization should be approached with caution, it may be noted that some of the lessons learned in Beer Sheva have found applicability elsewhere. Besides the advice and guidance given to medical schools abroad, Beer Sheva was also one of the founders of the Network of Community-Oriented Educational Institutions for Health Sciences, and has been one of its leading members. The potential contribution of the Beer Sheva Experiment has been recognized by the World Health Organization. The UCHS has been designated by WHO as a Collaborating Center for Integrated Health Services and Manpower Development for the last 13 years (since 1973).

ADDITIONAL CHARACTERISTICS OF THE UCHS

Besides the permanently ongoing effort to sustain the linkage of medical education and medical care, there are as well some factors within the UCHS that contribute in a great measure to its existence and progress. To enumerate just a few:

1) The UCHS is a multischool institution. It contains the Recanati School for Allied Health Professions in the Community (including a nursing school and a physiotherapy school), a School for Health Administration and Health Economics and a School for Continuing Education; in order to safeguard integration, all of these schools, including the medical school, are part of a *single faculty of health sciences*. While each school is administered individually and has independent admissions and curriculum committees, all the teachers are members of one faculty under one Dean and all the service facilities are common to the entire Center.

2) Basic sciences are grouped in small (five tenured members) teaching-research units with a strong health-applied orientation. There is no departmental structure in the basic sciences.

3) All clinical departments integrate hospital and community responsibilities. Department heads are charged with the supervision of patient care in their particular specialties throughout the region. The establishment of divisions (comprising a number of departments) with broad areas of responsibility reduces the chances for the formation of multiple feudal "empires." Physicians of the hospital are encouraged to become involved in the community services. Today, as a result of this policy, dozens of the 300 hospital doctors and many other health workers spend considerable amounts of time in regional clinics, some of which are quite remote from Beer Sheva. Numerous general and family physicians from the region are affiliated with different hospital departments and hold academic titles. This two-way flow of medical personnel constitutes a principal feature of the UCHS.

4) Attaching medical students to practitioners in urban and rural clinics is the best form of continuing education for community-based doctors. Since the physician is expected to teach students, he must continue to learn in order to function as a teacher.

5) The UCHS operates an independent Regional Unit for Health Care Evaluation and Planning, which is headed by the Professor of Epidemiology. Its findings serve as feedback in the assessment of the ongoing service facilities and needs.

6) The curriculum, the admissions policy and student participation are very basic components of the Beer Sheva Experiment, and each one of them is described in separate papers in this issue (Segall et al., Antonovsky; Henkin).

7) A major outcome of the UCHS has been the closing of the gap between preaching and practice. It becomes clear that it is not the charter of proclaimed aims and goals of a medical school that affects motivation for learning; rather what counts is the commitment of the teaching staff to such aims. It is the performance of teachers that enhances the students' will, enthusiasm and devotion to learning. Many medical schools today talk about community medicine, primary care, comprehensive and family health, and epidemiology, but neither the student nor the young doctor sees his teacher working outside the university hospital or the research laboratory. Indeed, if some efforts are made to expose students to the community and its health problems, it almost always is "too little and too late"; even this drop-in-the-bucket is never under the supervision of the head or senior person of a main clinical depart-

ment with whom the students naturally identify. How many medical schools have a clerkship in primary care and how many family doctors are members of the main faculty committee? It has recently become quite fashionable (fashion may also influence motivation for learning) to stress self-learning and a problem-solving approach in medical education. Again, many schools talk about it but forget to provide the students with the main tool: FREE TIME. "In many outstanding medical schools, students are still lectured to death—hours and hours a day. What kind of 'continuing learner' can such a student become when he does not find fun in studying and learns a lot for his examinations from his fellow paid note-taker. Ask medical students what they would like more of, and their answer will be free time" (2). But if the curiosity of the student is evoked by making the learning relevant, joyful and full of responsibility towards *their* patients from the very first year, then they will respond with great motivation, identifying themselves individually and collectively with the social objectives of the school. The same is true of members of the teaching staff. If you demand service but reward research by counting the number of published papers, the most dangerous conflict in a university medical institution is created: between science and service. The two must go together. They cannot be separated because one serves the other, and by no means are they exclusive. The higher the scientific standards the higher should be the standard of the service provided. To be more scientifically oriented a medical school must not be less society minded, and vice versa—a more society-oriented medical school must not be *eo ipso* less scientific minded. There is no either/or; there is no white or black. Any antithesis between sciences and service is false (3).

8) Another asset of the UCHS is its multinational faculty, by origin and education. Over 60% of our faculty were born and educated abroad and came to Israel as new immigrants. Only less than 40% are Israeli-born, some of whom were trained abroad. Thus, we have teachers of European, American, Asian and African origin. It is fascinating to see how their past training, language and educational psychology absorbed the concepts of Beer Sheva, and how many of them became not only participants of the program but leaders of high prestige and standards. All of us speak 14 languages, and yet we all speak one language.

AND SOME CONSTRAINTS AND PROBLEMS...

The barriers that separate the University from the service institution, the hospital from the primary

care clinic in the community, and the basic scientist from the clinician, continue to exist because of inertia. The creation of a regional consortium to achieve cohesion is a significant step in overcoming the inertia. In the 13 years of its existence, the innovation at Beer Sheva has acquired direction and momentum.

The consortium fulfils a utopian dream that has become a reality, but has not always functioned as well as it should. Some of the agencies involved have not always been fully committed in word and deed to the concept of merging academic and service responsibilities. Even when agreement has been reached at the highest national policy level, local functionaries and organizations with their own plans and habits have frustrated directives. Despite such setbacks, collaboration between the educational systems and the health services in the Negev has become a reality and is taking root in other parts of the country.

Let us take a closer look at the fate of a medical school that finds itself in a situation of double loyalty towards its two big patrons—the university and the health service organization. We need both and we would like both to leave us alone, from time to time. In our case we have to deal with two separate administrations that have different approaches: the Ben-Gurion University, with its headquarters in Beer Sheva, where we had to compete with the conflicting priorities of a University system, and KH, with its headquarters in Tel Aviv. To them we were only one of some 20 regions in the country, all bureaucratically controlled from the center (all our health facilities, hospitals and ambulatory clinics belong to KH). It is no wonder that living in such a schizophrenic atmosphere we eventually developed a great talent for acrobatics, trying to keep balance between the two.

The University setting

The advent of modern times, with the spectacular results of scientific and technological progress, and the social and political upheavals that resulted in broad educational and social welfare legislation, brought about a great change in the University's role in society. The modern university, be it state or private, developed a kind of schizophrenic personality. In Eric Ashby's description, "Round every Senate table sit men for whom the word university stands for... the kingdom of the mind. At the same Senate table sit men for whom the university is an institution with urgent and essential obligations to modern society... Both kinds of men... are right" (4). We live, today, in the congruence of what Alvin Weinberg calls "mission-oriented society" and "discipline-minded universities" (5). Academic medical institutions have, besides their traditional

university objectives of teaching and research, a third most vital social component—service to the sick. Society at large, consumers and students, numerous types of health insurance agencies, hospitals and community councils, medical professional organizations, and private foundations and charities all intervene within our medical centers. As a result, we are called to create a "mission-discipline duality."

We, in medicine, having been part of the university setting for a long time, have been fortunate enough to live and observe this split personality. We have much experience in this regard and perhaps have developed some biased opinions. We know that association with a university works both ways. While the natural and social sciences and the humanities have made and continue to make a decisive contribution to modern medical education, the development of the basic medical and clinical sciences has broadened the academic framework of the university and strengthened the interrelation with various faculties.

This challenge is, however, not devoid of some serious conflicts; let us enumerate a few. The basic science departments in medical school are called upon to assume broad educational functions beyond those involving medical students; they are participating in the preparation of a growing number of personnel for the allied health professions. Graduate education for the MSc and PhD degrees has grown in all basic science departments. Thus, though they are under the aegis of the medical school, basic science departments have come to function as university "life-sciences" departments. This is a somewhat new concept that may be regarded by their colleagues from the Faculty of Natural Sciences as usurpation of a long-standing tradition and becomes a source of friction based mainly on jealousy. A deeper and much more relevant cause for tensions may lie in the fact that a medical school differs from other faculties in one important aspect: in addition to teaching and research it fulfils a third important function: serving the sick. Service, in the eyes of university scholars, is a kind of nonacademic activity, thought to be of secondary importance by many colleagues from other faculties which ignore its preeminent educational value. Another source of occasional difficulty is the fact that the teaching hospital, one of the most valuable instruments in medical instruction and research, is not an integral part of the University but has its own administration and budget. Finally, there is the fact that research in the fields of health and medicine attracts a constantly growing flow of new "extra-university" resources. This sometimes enables us to extend facil-

ities beyond the balance-minded university person which does not favor the creation of what may termed a "medical empire." The University professors might fear that the UCHS personnel are promoted too rapidly and that consequently they will gain too much influence in the Senate.

Within the UCHS itself one has to keep in mind that there is a danger of a growing gap between the clinicians and the scientists due to the fact that they face different criteria in recruitment and promotion. The scientists, like other academics, are promoted by a general university committee, while the clinicians' promotions are determined by a special clinical committee. Regardless of these difficulties, which we may face as a result of our integration within the university, there is no road back, and there is no substitute for the University in keeping the profession tied to scholarship.

The service setting

Although the Ministry of Health's medical facilities in the Negev are *de facto* a part of the UCHS, the Ministry never signed a formal agreement with the University and KH. The main health service agency in the Negev is KH with its 750-bed Soroka Medical Center in Beer Sheva—the Yosephthal Hospital in Eilat, all primary care clinics in the region (about 160), laboratories, health centers etc. KH is the major health services associate of the UCHS; without it the Beer Sheva Experiment could neither have been conceived nor established.

The Gordian knot, which symbolizes our deeply interwoven relationship with external health service factors, is a result of the inseparable interaction between medical education and medical care organization in modern society. Weinerman sounds right when stating that:

The method and quality of medical education define the potential competence of the physician, but it is *the system of medical care organization* within which he actually works that determines the degree to which this potential is translated into effective performance... A good organizational system can maintain an effective level of performance among practitioners of only average quality, but a poorly organized health service will ultimately negate the value of even well-trained personnel (6).

The Negev is only one of 20 regions serving 85% of Israel's population whose health activities are controlled by KH. The doctrine of "parity and equality" prevails in Israeli public institutions. It limits KH's special relationship towards the UCHS. In addition, the four trade unions of physicians and workers, separate in the hospital and in the community, do

not facilitate easy decision making. Nonetheless, KH's contribution, both moral and material, is crucial for the existence and function of the UCHS. It is important that the director of KH, who was a close associate and a devoted initiator of the Beer Sheva Experiment, is still the functioning Director General of KH headquarters in Tel Aviv and has developed a deep commitment to the UCHS despite all the constraints under which he acts and the pressures exerted upon him from all sides.

It is noteworthy that since 1972 KH has appointed three national special committees to study reorganization of its structures. Each of the three have been chaired by one of the three deans of Beer Sheva. Some members of the foreign faculty of the Beer Sheva UCHS also serve as advisors to KH headquarters. It may also be said that the deans of the UCHS contributed financial support in equipment, building or research funds for the clinical departments of KH in the Negev. In addition, it was the first opportunity for KH to enter an equal partnership with a university in the field of academic medicine. This made the KH a total health care system including health manpower development. Thanks to KH the UCHS was able to fulfill its concept of not erecting a building of its own and currently does not intend to build one. Instruction and research are conducted in all the medical facilities in the region's hospitals, rural and urban clinics, preventive centers, etc. When one asks: "Where is the medical school?" The answer is: "nowhere and everywhere." Wherever there is a teaching or research activity going on, be it in a laboratory, clinic room, ambulance, or Bedouin tent—there is the medical school.

Because of the rigid centralization of KH, there is still no single authority for the Negev; the UCHS is not yet an organizational entity.

A RETROSPECTIVE LOOK

When KH and the University of the Negev in 1970 approached me, then Professor of Medical Education at the Hebrew University-Hadassah Medical School in Jerusalem, and asked me to prepare a draft for a new medical school in Beer Sheva, I have to admit that it was rather an easy task. I prepared a list of all the shortcomings of the highly scientifically oriented medical school in Jerusalem (which I headed for 22 years), the reverse of which became the draft program for Beer Sheva. I did believe then that this dream may become a reality. It happened indeed, and I was asked to implement it. Now, after 15 years in Beer Sheva and the school's 13th birthday, I think one can say that we survived quite well. I see three dangers: routine, fatigue, and deception. Is it hidden in the system or in the people? What is the

big threat that can stop us or jeopardize our plans? It is not easy to stay alert all the time; it is not easy to maintain local relevance in order to achieve international eminence (7).

It seems to me that we did not discover America. What we did in essence was to shift the emphasis from exclusively hospital-based clinical education to primary care, from "bedside" education to "community-side" approach. Consequently, population needs in health gain in value, and humane and comprehensive medicine becomes a pattern of medical practice in health and disease. Rather, the introduction of change in our own old but sound medical tradition created a new tradition for the medicine of tomorrow.

TRADITION AND CHANGE

When we pronounce the word tradition or traditional medical schools, we immediately have in mind something old and outmoded, something to be ashamed of, something that was beautiful and attractive a long time ago, but now is covered with dust or rust.

Medical schools throughout the world are categorized today as "traditional" or "innovative." The term "innovative" was not conferred on them by anybody; they simply call themselves that, implying a pretentiousness. However, we learned that in order to introduce a new look, it is not obligatory to start from scratch. There is never an excuse for not introducing new aims and goals into old well-established medical schools. Let us consider "tradition" in medical education. To our great amazement, the basic academic freedom in the selection of students and staff, in shaping a curriculum rich in electives, in close teacher-student relationships, and in independent research—all accompanied by state financing and reasonable student participation and control—were included in the statutes, published in 1589, of the first state university medical school in Padua, Italy, which flourished between the 13th and 16th centuries (8). It was a "student university" originally controlled and wholly financed by the students, who hired their professors and kept them in unbelievable servitude, though they had the good sense to leave to their professors the responsibility of conducting the examinations. All that, together with academic freedom and a degree of student control that would be considered revolutionary today, comprised the system that allowed the ascendancy of Padua over Paris and Oxford, where the students had but little or no authority. The facts are that these well-motivated and ambitious students founded a university which they controlled over several centuries, and which

surpassed in academic excellence the other universities of Europe that were controlled by the students' masters only. It was a State university, as long as the State did not interfere with academic affairs; it was a highly successful cooperative venture of teachers, students and the State (8).

Such a medical school, if it could only be found today, would easily deserve the denomination "innovative." But looking back some 50 years when I started my medical studies in France, we had some wonderful experiences: it was fun to be a medical student and it was exciting to study medicine and be a member of the "congregation." Already in the second year we spent much of the morning in the hospital wards. Not that we understood too much, but we began to breathe the atmosphere of clinical medicine. Since we did not know medicine, we tried very hard to care about patients' comforts, rather than to cure them.

Before approaching proposals for change let us always be rather cautious, since tradition for the sake of tradition and change for the sake of change is a curse, a misfortune.

In this regard, it is useful to recall the conflict of interest in health care, the responsibility for the health of the individual in contrast to the responsibility for the health of society. This dualism is the heritage of physicians, either by tradition or default. While some aspects of both responsibilities may appropriately rest with physicians, they must also be shared with experts from a variety of disciplines beyond those with which medicine has traditionally interacted, such as law, ethics, economics, sociology, management and information sciences, etc. (9).

Let us return for one moment more to the past. The famous Flexner report in 1910 was crucial in shaping American medical education by placing American medical schools under the auspices of universities and giving them the sound basis of sciences. However, his report is not always cited to its very end. I would like to quote his final remark:

"The physician's function is fast becoming social and preventive rather than individual and curative. Upon him society relies to ascertain and to enforce the conditions that prevent diseases and make positively for physical and moral well-being. It goes without saying that this type of doctor is first of all an educated man."

Tradition and change live within ourselves constantly. The changes that we introduced, supported strongly by student participation, have their roots in both international and our national tradition in

medical education. We would like our students to learn that not everything new is better and not everything published is correct. The two, tradition and change, are not contradictory; they may, or even should be, complementary. This is seen today in many medical schools throughout the world. There must not be an either/or. An antithesis between the two is false, although they may well work in tandem. We love classical music but we may love it even more while listening to a modern stereophonic recording. Some of us love modern art but we all visit museums in Italy, Spain, France, England and elsewhere to get the inspiration of eternal beauty. Looking at Chagall's paintings we see how the traditional and the modern create a harmonious perfection. We all love Jerusalem with its unique mixture of tradition and change.

We hate servitude, feudalism and compartmentalization—there is no place for them in our medical schools. We fight for individual academic freedom for each of our teachers and students. Institutionally, however, we are committed, each one of us, to our country's and population's health needs. Let us not copy others but establish different approaches from which others may learn. Both tradition and change have elements of truth in themselves. Let us, therefore, cherish and respect our great heritage but not use it as an excuse for not encouraging and breeding innovations and changes.

CONCLUSIONS

It is perhaps justified to ask ourselves, on this 13th birthday and before concluding, whether we did commit mistakes. Yes, of course we did. Only those who do nothing do not commit mistakes. It is my impression that we have made mistakes or misjudgments in strategy here and there, but not mistakes in ideology. The built-in systems of evaluation and debriefing in both education and services have always been alert to put on the "red light" in time, so that, using feedback, we could correct the mistakes. I would rather restrain myself from going into details. During the 13 years of the existence of the Beer Sheva medical school, we have had three deans. I was the first and would prefer others to speak about my mistakes. My successors have enough insight to see their mistakes, if any. In any case, the effort to maintain the momentum and to care for the strengthening of coexistence in both the different and multiple elements of the Beer Sheva Experiment has been one continuous collective process of survival and dynamic progress.

Notwithstanding the important structural arrangements made to enhance integration, the success of the project is most dependent on the spirit of

the team and its leadership. The structure provided a conducive framework, but the dedication of the staff and the commitment to collaboration could not have been achieved through design of structures alone.

It appears to us that the single most important force in the Beer Sheva Experiment is its student body. A critical mass of strongly committed graduates could be expected to become the guardians of the Beer Sheva concepts and not allow the program to stagnate. They will keep the faculty honest with regard to the institutional goals. They are bridging the gap between the clinics and the hospitals. The students are not permitted to stop with their critical evaluation, but they are required to participate in designing corrective measures and implementing them. Certain conditions seem to be essential. The partners to any collaboration must want, and know how, to work together. Within a flexible framework of agreement there is a need for much negotiation, consultation and mutual adjustment. The motivation to work together in Beer Sheva is based on a team spirit, proud of its achievement and convinced in its directions. It is inevitable that as the organization grows older some of its original goals may be

displaced. But it is hard for us to conceive of the Beer Sheva UCHS turning into a traditional, departmentalized, fragmented health center. The momentum for integration is definitely there.

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Willoughby Lathem

Editor

"The future of academic community medicine in developing countries."

Rockefeller Foundation, New York, 1973

"This extraordinary development in Israel is without parallel: It is most unlikely that the events which have taken place there could occur in any other country. One may look for causes and explanations, but these can only be general and speculative. It is the history of Israel, the culture of the Jewish people, with its emphasis on health and admiration for the medical profession, and the nature of Israeli society, that have created the Beer Sheva experience. No two countries are the same but no country has any greater claim to uniqueness than Israel has."

THE ARAD STATEMENT

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Key words: Beer Sheva Experiment; medical education; task force

The year of 1972 and early 1973 might best be called the year of the faith. Well before the official government decision approving the establishment of the Center for Health Sciences was taken in May 1973, extensive preparatory activities were under way. Many meetings were held with Negev health practitioners, including "pre-faculty council" assemblies. Politicians, key University faculty and other public figures became involved. Visitors from abroad and colleagues from the north of Israel came to Beer Sheva. The first draft of a curriculum was prepared. An international symposium was held on health services. An atmosphere of intense excitement and enthusiasm was generated.

One finds varying ideas in the documents that appeared in those heady days:

The primary objective of the Medical School is best expressed in the word "service"—to turn out service-minded physicians, trained and dedicated to serving the community... We shall fail should less than 50% of our graduates go into primary care and will likewise fail should all 100% restrict themselves to primary care, for we want our philosophy of "service" also to spill over into the specialities which by and large control the tone of the world of medicine... (although in a sense primary care is itself a highly specialized area)...

The intention is not to create an institution for the training of general practitioners or family physicians (although many may follow this pattern), but to educate physicians whose initial interest in comprehensive medicine has been systematically rein-

forced by encouragement and appropriate training. Graduates will be able to work in both the hospital and the community and provide high-quality health care in any organization or institutional framework. Those who became traditional specialists at least will have had experience in comprehensive medicine...

By the summer of 1973 a core group had been established at the University. The time had come to begin translating generalities into specifics. Moshe Prywes convened a Special Task Force Meeting, held in Arad on 4 October 1973, whose assigned mission was to formulate the educational objectives of the medical school of the University Center for Health Sciences and Services in the Negev. The professions of the nine task force members are worth noting. In addition to Moshe Prywes, a trained surgeon and a long-time medical educator, the force comprised a pediatrician/cell biologist, an epidemiologist, a child psychiatrist, a veterinarian/immunologist, a neurobiologist, a medical sociologist, a nurse administrator/educator, and a health services administrator.

By the end of the day's discussions, what has come to be known in the local jargon as "The Arad Statement" was formulated:

Upon completion of the formal course of studies, a graduate of the M.D. program will have acquired or developed knowledge, abilities and attitudes so that he* will be able to:

* Note that in 1973 we spoke of "he:" today we would probably write "he/she." As a matter of fact, however, there was some consensus in the Student Admissions Committee that the traits we were looking for among candidates would favor the selection of women. This has not turned out to be true. Over the years, the proportion of women in the class has been around one-third, which is just a few percent more than the proportion of women applicants.

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A. Perform professional services within a community health care system compatible with the overall policies of University Center for Health Sciences and Services:

1. Identify and define present and future community health problems and work to resolve such problems by the planning, implementation and evaluation of preventative or remedial programs.

2. Use clinical skills, knowledge, original observations and appropriate records to identify, diagnose, manage (prevent, refer, treat rationally) and follow up health problems of his patients, taking into account the physical, psychological and sociocultural aspects.

3. Work as a leading partner in a health care team.

4. Educate the population and motivate them to improve their health.

1. Take part in postgraduate training (residency program, specialization, courses, etc.) and teaching (students and colleagues).

2. Periodically evaluate his professional activities, recognize his educational needs, select appropriate learning resources and evaluate his progress.

C. Aid the development of the health sciences by engaging in teaching and research:

1. Seek solutions to new health problems of his patients, community or health care system with which he is not familiar.

D. Maintain and develop personal characteristics and attitudes required for professional life, such as personal integrity, sense of responsibility and dependability, and ability to relate to, communicate with and show concern for and respect to his patients and colleagues.

Frederick C. Robbins

President

Institute of Medicine, National Academy of Sciences,

Washington DC

Moshe Prywes Distinguished Lecturer, 1982

"Dr. Prywes is one of the best known medical educators in the world. This school, which many of you have helped him create, is looked to as one of the boldest and most imaginative innovations in medical education in a very long time. The combining of the service and educational activities in a truly integrated way, and the inclusion of services other than those that are hospital based are important efforts that are significant to all parts of the world. From what I know of the educational program of the Ben-Gurion University Medical School, it would seem to me to be designed to prepare its graduates to deal with the rapidly evolving and not entirely predictable future. The combination of education and responsibility for medical and health care of a defined population within one organization offers a unique opportunity to conduct epidemiologic and sociologic research in combination with the more traditional biomedical investigations and avoids the preoccupation so prevalent in many medical schools throughout the world with tertiary hospital-based care."

THE CURRICULUM: A 13-YEAR PERSPECTIVE

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Key words: Beer Sheva Experiment; medical education; curriculum; regional orientation; health care delivery

The University Center for Health Sciences and Services at the Ben-Gurion University of the Negev accepted a dual mandate when it was established in 1974: to serve as a catalyst for the development of an integrated community and hospital system of health care in the Negev, and, in parallel, to educate students to be motivated and competent to function within this system. Implied were basic changes in the pattern of health services, calling for physicians, nurses and other health personnel to assume unfamiliar roles and responsibilities. Traditional attitudes would need to be modified and new professional competencies acquired. Recognition of the interdependence of innovations in health care and in medical education gave rise to what has become known as the Beer Sheva Experiment (1-3).

It was in this context that a 6-year program of medical studies was designed. Two facets of the Beer Sheva Experiment have had a particular impact on curriculum development: a regional orientation based on the merging of medical education with the delivery of health care in the Negev, and a commitment to address the broader issues confronting medical education throughout the world. Interaction between the two is reflected throughout the educational program. Indeed, the thread of curricular continuity over the past 13 years is represented by the values that underlie both the regional orientation and the concern with student learning. As circumstances change, so do the form and content of the curriculum; but now, as in 1974, both reflect the basic social, educational and professional values

that informed the process of curriculum development at its outset.

REGIONAL ORIENTATION

Responsibility for coordinating both service and training is vested in a single health authority, the University Center for Health Sciences and Health Services in the Negev. This is a consortium established by the Ben-Gurion University of the Negev, through agreement with Kupat Holim (Health Insurance Institution of the General Federation of Labor) and the Ministry of Health. The Center provides a framework for integration of services, collaboration in teaching and, of particular relevance to curriculum development, defining the professional roles of the medical school graduates.

This interface between medical education and health care enables the medical school to both stimulate and reflect changes in the patterns of health services. By participating in the consortium, it can mobilize academic resources for the improvement of regional health care. Changes in the delivery of services remain the responsibility of the health care agencies (4-8).

Impact on the curriculum

Medical education is anchored in all facets of health care delivery represented in the consortium. Educational objectives are derived from professional practice in the Negev, based on analysis of the competencies needed for effective physician performance. This approach to curriculum development has had a significant impact on the program of medical studies. Rather than focusing exclusively on hospital-based episodic care, the educational perspective encompasses the full spectrum of health and

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disease, ranging from early prevention through acute care to rehabilitation. It is postulated that a comprehensive and balanced study of all phases of the natural history of disease will better prepare students to function in the type of integrated hospital and community health care system being developed in the Negev.

Consequently, teaching takes place in a wide range of primary and secondary health care settings. They include community health clinics, hospital wards and outpatient services, rehabilitation facilities, public health stations and occupational health clinics. Not only does the curriculum bear the stamp of a general community orientation but also a significant proportion of learning experiences are community based (9-11).

Judicious sequencing of these experiences exposes students to the intellectual challenge and opportunities for service, associated with the primary care dimension of successive stages in the natural history of disease. This dimension is of particular importance in resolving the health problems of the Negev. It enables the patient to have ready access to health care, it integrates health care and assures its continuity through the various phases of illness, and it makes use of community outreach programs (12-15).

This perspective emphasizes the acquisition of competencies in prevention and rehabilitation as well as in acute care. It is therefore appropriate that the natural history of disease constitutes a major theme in the curriculum. As used for curriculum planning at Beer Sheva, it refers to the progress of disability resulting from disease. Intervals can be identified along the time axis during which intervention may prevent the onset of disease, lead to its reversal, slow its progress and reduce personal and social disability.

Two consequences are anticipated. One, a significant proportion of graduates will consider career pathways in primary care. Two, it is expected that all students, whatever their eventual career choices, will have acquired sensitivity to the primary care dimension of all types of medical practice, as well as basic competencies in primary care.

Impact on services

Clearly, the integration of the regional health care system with the curriculum has strongly influenced the program of medical studies. This is reflected in the educational objectives, the content of teaching, methods of instruction and the settings in which learning takes place. To what extent is the converse true? Has the curriculum influenced the delivery of health care? (16)

At the level of undergraduate medical studies, the curriculum helps shape the health care system and serves as a stimulus for change in several ways. The multifaceted curriculum results in the creation of many new links between the health care facilities involved. Collaborative teaching tends to stimulate new patterns of interaction in the delivery of service.

The influence of contact with students on their clinical teachers has not been negligible. For some, professional practice in the hospital or in the community had become an unquestioned routine. In the climate of enquiry generated by contact with students, many have been spurred to reexamine long-established patterns of practice and, in the process, set higher standards for patient care. For others, participation in teaching within the community has opened new vistas for meeting those health needs of the population that are less effectively served in traditional medical care settings.

Student involvement in health care often helps to highlight unmet health needs of the population, which, in turn, leads to the initiation of needed health care programs. In addition, public health projects conducted by students often provide basic data that can be used in the planning and evaluation of health care (17).

What long-term consequences can be expected of the collaboration between the educational and service sectors? The answer, in great measure, lies with those graduates who will choose to practice medicine in the Negev. During the early years it was thought that changes in health care delivery could be synchronized with the educational process: it was expected that the environment in which new graduates would practice would permit them to provide the comprehensive health care they had been taught in the curriculum.

The reality proved to be different. Changes in health care were introduced more slowly than had been projected. The early graduates opting for careers in primary care had to choose between two apparently irreconcilable alternatives: to serve communities in the Negev by working within the constraints of existing community-based clinics or to achieve a higher standard of patient care by leaving the Negev to practice less restrictive forms of primary care elsewhere. Both service in the Negev and high-quality primary care are values that the curriculum seeks to transmit.

The original expectations were therefore revised. Accelerating change in the regional health care system now became one of the foremost challenges to graduates. (Ways in which they have met the challenge are described elsewhere.) Whether the momentum generated by these efforts can be sustained

depends only in part on the curriculum. Limiting factors may be unrelated to what happens in undergraduate medical education (18, 19).

EDUCATIONAL ISSUES AND RESPONSES

Scope of the curriculum

While the Beer Sheva curriculum is designed to reflect regional priorities in health, these are addressed within the wider context of medical education in the world today.

Among the key issues is the scope of the curriculum and the relative weight allocated to its various components. While the duration of undergraduate medical curricula has remained relatively constant over many years, the rate at which new knowledge accumulates in the basic sciences and the clinical fields is increasing rapidly. The resulting pressures towards ever-increasing specialization give rise to new demands for representation in a curriculum that is already limited by time constraints. Often, the problem is resolved arbitrarily. The outcome is determined by the interaction of faculty interests with the power structures of institutions.

A more rational approach is to set criteria for deciding what a curriculum should include. There are both qualitative and quantitative dimensions to these decisions, and they affect the depth as well as the breadth of teaching in each component of the program. Beyond these considerations of curriculum content, there is a need to address the nature of the learning process itself as a means of preparing students to adapt to the constantly changing technological and social basis of medical practice.

Curriculum development at Beer Sheva requires that decisions concerning each area of study be made according to explicit criteria. For the most part, these are expressed through instructional objectives that define the outcome of student learning in terms of competencies to be acquired. Specification of objectives encourages systematic course planning and promotes accountability in the allocation of time and other instructional resources. Methods of teaching and evaluation can then be selected in relation to specific objectives, rather than on *a priori* grounds (20).

Since the program of studies is designed to facilitate achievement of competency-based objectives, the way in which these are derived assumes considerable importance. The approach adopted at Beer Sheva is to base the competencies expected of students on those that practitioners need. Many are generic in that physicians need them wherever they practice and in whatever specialty. They include problem solving, self-assessment, independent study and communication skills. Others are categorical,

reflecting more situation-specific determinants. Geographic variation in patterns of disease prevalence, modalities of health care or available technology, for example, give rise to differences in the range of specific diagnostic and therapeutic skills needed. Categorical objectives at Beer Sheva reflect, in part, the health and health care characteristics of the Negev (21).

Of no less concern than technical competencies are the values that will guide students in applying knowledge and skills. These values are equally amenable to performance analysis. Attitudinal objectives are thus grounded both in the values espoused by the medical school and in the reality of medical practice in the Negev.

This approach responds to student needs as currently perceived. It does not, however, by itself, prepare graduates who will be able to cope in the future with the rapidly evolving scientific and social basis of medical practice. Undergraduate medical education is but the first phase of a lifelong continuing education for the physician. Study habits and patterns of reasoning are important determinants of the future practitioner's ability to adapt to new circumstances and problems. Concern at Beer Sheva with these dimensions of education has had several significant consequences.

Developing capabilities for self-assessment and self-education have been designated as generic objectives throughout the curriculum. The evaluation system provides continuous opportunities for self-assessment by students, supported by resources for remedial intervention. Individual initiative is thereby encouraged and reliance on external sources of motivation diminished.

Another, related, generic objective that transcends course boundaries within the curriculum is the development of problem-solving skills. These involve application of the following sequential steps: 1) problem identification and formulation of objectives for intervention; 2) selection of an intervention from among possible alternatives; 3) implementation of the intervention selected; 4) evaluation of outcome in terms of objectives and unplanned consequences (22).

The curriculum gives prominence to how problems are identified and structured. Problem definition impinges on all subsequent stages of problem solving, as it circumscribes both the objectives and the modalities of intervention. In the clinical context, for example, delineating patient problems exclusively in terms of their pathophysiologic components will result in interventions directed solely at these components. Hence, emphasis from the first year of medical studies is on a more comprehensive

framework for diagnosing clinical problems, in which the psychological, social and pathophysiologic dimensions are integrated.

A comprehensive approach is also encouraged in dealing with health problems in the community. These are defined not only in medical terms but also in relation to other factors that affect the well-being of communities. Social, economic or educational interventions, for example, may be critical to the solution of a particular public health problem. They are liable to be overlooked, however, if the frame of reference for problem identification is confined to medical considerations alone.

Problem-based learning has also found increasing application in the teaching of basic sciences, where it has led to a shift in emphasis from memorizing details to critical thinking. It should be noted, however, that the Beer Sheva curriculum uses various methods of instruction, from didactic lectures to independent, problem-based learning.

Selecting instructional methods for a particular segment of studies is generally influenced by several considerations. These include the educational goals, the learning resources available, and the teaching styles and competencies of instructors. The emphasis on selected generic objectives, for example, varies according to instructor preferences and course time allocated.

Relevance of the curriculum

The widespread debate in recent years on the issue of relevance in medical education has challenged the traditional curriculum structure as being inadequately responsive to students' learning needs. Although at times more rhetorical than reflective, this debate has stimulated reassessment of undergraduate medical education by students as well as by the administration and the teachers.

The operational context in which the question of relevance arises is the relationship between parts of the curriculum and their sequencing. The main issues concern the interval separating the acquisition of knowledge from its application under conditions that stimulate professional practice. In the traditional curriculum, courses are taught in relative isolation and layers of basic studies are separated in time from layers of clinical application. While this strictly hierarchical approach may seem logical and have administrative advantages, how students perceive it has important motivational consequences and affects retention of knowledge and skills acquired.

The spiral concept of the Beer Sheva curriculum is based on the premise that learning and its retention occur more effectively when reinforced concurrently

across diverse components of the curriculum and longitudinally over its successive phases. Basic sciences, clinical medicine and public health are the three principal areas of teaching. Instruction in each begins in the first year and continues throughout the 6 years. Just as clinical studies begin in the first year and continue until graduation, so the basic sciences are not confined to the early years. Both proceed in tandem, drawing on whatever fields of knowledge can contribute to solving the particular problem under consideration. This approach stresses the continuing utilization of knowledge from the basic sciences for solving problems similar to, or identical with, those of clinical practice. The complexity of problems and level of simulation increase progressively as students advance through the several phases of the curriculum.

As the students gradually acquire new knowledge and skills, they progressively assume independent responsibility for patient care. This begins in the first year with the early clinical program, when it is limited and exercised under direct supervision. As the student progresses, the scope of responsibility is gradually enlarged and the degree of student autonomy increases. This is in contrast to the more traditional, sharp demarcation between preclinical and clinical studies, which results in students assuming clinical responsibilities in large, and at times overwhelming, increments.

The emphasis on problem solving calls for considerable interdisciplinary learning. It is postulated that this occurs best after students have acquired a basic foundation in each of the relevant disciplines. This implies a sequence in which relatively short introductory courses in the various disciplines appropriate to each phase of the curriculum precede blocks of problem-based interdisciplinary learning. These courses enable students to acquire the essential vocabulary, basic concepts and principles, as well as the methodological tools of the respective disciplines, before proceeding to their integration.

Sequencing components of the curriculum is generally guided by the principle that the knowledge base underlying clinical or public health measures should be acquired prior to experience in their application. At times, however, an approach more akin to the discovery method is used. Students are exposed to problems for which they have not learned the theoretical background. The premise is that, under circumstances in which questions arise out of personal experience, students will use their own initiative in seeking answers. Resources for this purpose, including formal instruction and informal access to teachers and libraries, are made available. This approach introduced early in the curriculum is

designed to channel experiential sources of student motivation into the development of patterns of independent study.

The clarity with which expectations concerning academic performance are communicated to students is an important determinant of how they distribute their time and effort. Often, considerable student effort is misdirected because of lack of understanding of what is expected. The process of curriculum development at Beer Sheva encourages the preparation of units of instruction for each subject area, clinical internship or field assignment. These may include explicit competency-based objectives, recommended learning activities and instruments for self-assessment.

It is recognized that the various measures taken to achieve relevance of the curriculum to learning needs require validation through examination of their consequences. To this end, the evaluation system provides for students, teachers and members of the curriculum development unit to review together each segment of the curriculum. The "debriefing" sessions are based both on learning outcomes related to the specific objectives, as measured by examination, and on analysis of the teaching/learning process, as perceived by both students and instructors. After each review, steps may be recommended to improve conditions for learning, and these suggestions serve as a basis for the revision of instruction.

The role of students is broader than merely providing feedback as "consumers" of the educational process. They are encouraged to participate in developing solutions to the problems identified at the debriefings and, with members of the teaching staff, to assume operational responsibilities in their implementation. In this way, students can acquire problem-solving skills in relation to the first professional problem which they face—their own medical education. In the process, they provide a self-renewing source of energy to counterbalance the entropic tendency of a complex curriculum to become simpler and less demanding.

Introducing and sustaining innovation

In the climate of change in medical education today, questions related to introducing and sustaining curriculum innovation are of increasing concern. Established medical schools in the process of reassessing their educational programs are affected, as are new schools, which are perhaps less constrained in their efforts to respond to the forces of social and technological change.

The interplay of factors is complex, involving overt and more subtle pressures and counterpressures from outside, as well as from within the

institution. Available resources and the degree of flexibility in their allocation often set limits to innovation. The organizational structure and relationships among the various administrative units determine the routes by which it occurs. Attitudes and vested interests of faculty members who are called upon to implement the changes either facilitate or impede the process. Academic leadership may play a decisive role by creating a climate in which teachers and students accept the risks of innovation.

A decade of experience at Beer Sheva provides a case history of an attempt to introduce innovation in medical education under circumstances characterized by meager resources, an unstable infrastructure, an atmosphere of openness to change, and strong leadership.

It should be noted that the context within which innovation at Beer Sheva occurs is determined by the goals of the medical school. These set the terms of reference for assessment of all curriculum proposals. In considering possible educational alternatives, the effort is to select those, whether traditional or innovative, that facilitate attainment of the institutional goals. There is no commitment to novelty as an end in itself.

The process of curriculum development itself has helped to introduce and sustain an environment within which the program of studies can respond to changes in health priorities, student needs and institutional resources. It has been characterized consistently by a wide base for decision making. Broad participation of teachers and students is encouraged, and opportunities are provided to express and exchange opinions before decisions are taken. Although the criteria for curricular decisions form part of institutional policy, responsibility for their application is broadly delegated.

In matters involving issues of policy, decisions are taken by interdisciplinary committees acting for the medical school as a whole, rather than on behalf of any particular department. The committees have authority to require changes in instructional objectives, to redelineate subject area boundaries, and to determine how instructional resources, including curricular time, are distributed. The specific mechanisms whereby this is accomplished have varied over the years with changing faculty resources and constraints.

This process has tended to increase the overall coherence of the curriculum and facilitates both horizontal and vertical integration. However, individual departments are apt to perceive it as an infringement on their academic freedom. This view has changed gradually as a growing proportion of

faculty members have internalized the values underlying the Beer Sheva Experiment. It has therefore been possible, over the past 13 years, to progressively increase the degree of decentralization in curriculum development without compromising its basic principles. This trend is likely to continue as more graduates of the school become members of the faculty and take part in curriculum development.

The rate at which innovation has been introduced over the first decade is related to the notion of proceeding by successive approximations. A potential pitfall in planning for change is to regard the outcome in dichotomous terms: either the innovation in its entirety will be accomplished immediately, or it will never occur. Often, it is neither feasible nor desirable to institute all aspects of an innovative measure at the same time. Unrealistic expectations can lead to premature and unwarranted pessimism and to the abandonment of effort. The approach by successive approximations, utilized at Beer Sheva, adapts the rate of change to the resources available and the constraints not immediately amenable to control. Objectives are phased over an appropriate period of time and motivation is reinforced as each successive approximation is achieved.

In this way, modifications can be made continuously in the light of cumulative experience. The evaluation procedures built into curriculum development ensure a periodic review of each instructional segment, which results in its retention, revision or elimination.

Innovation almost invariably results in greater demands on faculty time. Most members of the relatively small faculty would find teaching in a traditional curriculum difficult. This is particularly true of the clinical teachers, who must cope with an overwhelming clinical load. Although most are prepared to accept the added burden associated with the experimental nature of the medical curriculum, without sufficient staff support, their best intentions would be of little avail. This was recognized and a curriculum development unit was established when the medical school opened. It provides technical consultation and staff support to individual teachers, planning committees, coordinating councils and their executive committees. It mobilizes instructional resources, assumes responsibility for the training of the teachers for their educational functions and oversees evaluation. The unit takes the lead in curriculum development and, at the same time, responds to the needs of faculty and students. The Beer Sheva experience underscores the importance of this type of leadership and staff support in translating innovative educational ideas into viable programs.

A sense of commitment and involvement among the teaching staff is a necessary, but insufficient, condition for successful introduction of innovation into the curriculum. This must be complemented by the ability to apply new skills to the design and implementation of instruction. Otherwise, the rhetoric of curriculum change is unlikely to result in educationally valid programs. Enthusiasm cannot substitute for competency, and teachers who do not have these skills cannot be expected to apply them.

At Beer Sheva the need to train teachers for their educational tasks was recognized from the beginning. Initially, short introductory workshops in educational methods were offered several times a year. As the number of these workshops grows, opportunities for more advanced training are being provided. In addition, in-service training in the form of technical consultation by the curriculum development unit is provided throughout the year to individual teachers, as well as to committees responsible for educational planning. The result of these efforts is a steady increase in the proportion of faculty members with the background and skills to implement innovative aspects of the curriculum (23).

It would be simplistic to maintain that the impact of the curriculum can be completely explained in terms of the variables discussed above. Human factors and interaction between students and faculty are more difficult to delineate and assess. Their influence on outcomes of the Beer Sheva Experiment, however, has been crucial. In the early years there was a sense of shared purpose and determination to succeed in the face of overwhelming odds. This ethos arose, in part, as a response to the difficulties encountered, including a fragile academic infrastructure, the dearth of clinical role models (particularly in primary care), and the inertia encountered in changing patterns of health care.

To a significant extent, the atmosphere of challenge and excitement has been sustained by quasi-mythical perceptions of the medical school's mission, which transcend the realities at any point in time. The result has been numerous individual and group initiatives on the part of teachers and students to improve both health care and education. These have gone far beyond the structured opportunities for introducing changes that the curriculum provides.

Towards the end of the first decade, the initial high level of enthusiasm had started to taper off. Commitment to the basic values that had characterized the medical schools at its inception was, however, still very much in evidence. Many of the early innovations had become institutionalized and were now firmly anchored in the curriculum. Others, such

as those imposing unrealistic or excessive demands on students, could not be sustained and were either modified or discarded. Continuity in the curriculum has therefore been more in terms of the values it reflects than in specific patterns of instruction.

Innovation in medical education often develops out of circumstances that are specific to individual institutions rather than as a result of planning for change at a national or international level. The impact of an innovative curriculum must therefore be judged against the goals set by the particular medical school and the constellation of resources and constraints within which it is implemented. Considerable caution is necessary when attempting to generalize from the results obtained at any one institution.

Evaluating the outcomes

Of primary concern is the effect of innovation in medical education on the accessibility and quality of health care. Curricular change, for example, may result in graduates being better able to meet health priorities of the community. The distribution of career choices may become more responsive to the needs of the health care system, and the standard of care may improve. These outcomes, however, are affected by determinants other than the nature of undergraduate medical studies. Choice of specialty and of place of practice may depend more on such factors as personal background, economic incentives and family considerations. The relative contribution of undergraduate medical education to the quality of ultimate physician performance, as compared with that of subsequent postgraduate studies, has yet to be clearly established. Longitudinal studies of Beer Sheva graduates to elucidate these relationships are currently in progress (24, 25).

With these considerations in mind, the evaluation system is designed to assess student progress through successive phases of the curriculum and afterwards to monitor the professional activities of graduates at subsequent stages of their careers. A principal concern has been to adapt the method of evaluation to the school's educational goals. This has probably caused more controversy over the past decade than any other aspect of curriculum development. Initial attempts to use formative evaluation as a learning tool, rather than for certification, met with considerable resistance. It clearly ran counter to deeply ingrained habits of most students and teachers. Efforts to introduce integrative, problem-based, rather than disciplinary, examinations in the early phases of the curriculum met with a similar fate.

Towards the end of the decade the evaluation

dialectic had brought about a more empirical approach to student evaluation. Concern for consonance between educational objectives and the way they are evaluated was balanced by an increased sensitivity to the amount of change that could be absorbed without jeopardizing other important elements of the curriculum (26).

In addition to its impact on students and graduates, the curriculum is also expected to have a direct influence on the regional system of health services in the Negev. As described earlier, physicians, nurses and other health workers in community health clinics, hospitals and public health centers collaborate in the teaching programs. Linkages among health care facilities for educational purposes foster communication and open the way for the development of new functional relationships. Interaction between practitioners and academic staff tends to stimulate reassessment of current practice, preparing the way for change. As part of several large-scale studies currently under way, the qualitative and quantitative dimensions of these service-related outcomes of the curriculum are being explored.

CONCLUSION

During the first decade the medical curriculum at the Beer Sheva medical school has acquired both direction and momentum. The direction has been consistent with the regional orientation of the University Center for Health Sciences and Services, as well as with its commitment to addressing the broader issues that confront medical education. It is reflected in the responsive environment brought about by the process of curriculum development and in the form and content of the study program. Both have evolved with changing circumstances; new health priorities have emerged, as have fresh educational insights. The resources and constraints that impinge on implementation of the curriculum are continuously recast.

Adapting to these changes has called for both procedural and substantive flexibility. As a result, the potential for innovation has not been transient, limited to the early years, but has extended throughout the first decade. Innovations, however, have not been arbitrary. Rather, they have been shaped consistently by the same set of basic values upon which the medical school was founded.

Curriculum momentum, in turn, has largely been a consequence of the direction that the school has taken. The high level of commitment among faculty and students would have been unlikely without such a challenge as the Beer Sheva Experiment. Strong academic leadership, an ethos that stimulates collaborative educational and service initiatives among

teachers and students, and a relatively high level of technical support for curriculum development, have also contributed significantly to the momentum. Continuing rather than episodic evaluation has tended to produce gradual rather than abrupt changes, and much of what was new and tentative has become customary and stable.

What has the impact been? To what extent have expectations of the curriculum been met? As regards impact on health services, two limiting factors were encountered: inertia and resistance of the health care system to change, and the lack of a critical mass of practitioners with the credibility and leadership qualities needed to overcome these barriers. Certainly, changes have taken place in the climate of opinion, and even individual instances of "break-throughs" brought about by the efforts of students or graduates can be cited. However, the system can absorb these without changing fundamentally. Innovation is occurring, but more slowly than was originally anticipated, probably reflecting national trends more than regional determinants. Under these circumstances, the role of the curriculum, as one element of the Beer Sheva Experiment, in bringing about change has been quite modest.

The educational impact is more evident. Follow-up of the first cohorts of graduates suggests that their attitudes and performance during early post-graduate years bear the imprint of the curriculum. However, the effect of medical studies is probably confounded with that of student selection. A conservative assessment of the curriculum might be that it provides students who have the potential for developing certain personal and professional qualities, consonant with the Beer Sheva ethos, with encouragement and opportunities to do so.

The curriculum has had educational reverberations outside Beer Sheva. Other medical schools in Israel have adopted some of its elements. In addition, through publications and personal contact, the educational dimension of the Beer Sheva Experiment has had an influence on the training of health professionals in other countries.

What of the future? Will the curriculum continue as a dynamic instrument for achieving the goals of the University Center for Health Sciences and Services? Several considerations suggest that this may be the case. Firstly, members of the Center have reaffirmed their commitment to the values embodied in the curriculum, after several successive comprehensive reviews. More effective and efficient implementation emerged as the overriding concern. In many respects, these recent positions adopted by the Center are more informed than those taken in 1974. They are based on a critical sifting of experience

acquired over the years and reflect a growing body of research on the educational program (27).

Secondly, the educational cycle is now complete, with Beer Sheva graduates assuming an increasing role in instruction. As their numbers increase, so will their impact on the curriculum. Thirdly, curriculum development as a process responsive to changing circumstances has been progressively institutionalized. It thus can adapt to new challenges as they arise.

There is little doubt that teachers, students and administrators are prepared to continue in the direction charted during the first decade. Their ability to do so, however, will be limited by constraints in the Beer Sheva situation. Some are beyond the control of the medical school, and are determined by political, economic and social development in the country as a whole and, more particularly, in the Negev. If past experience is any guide to the future, the final chapter has not yet been written on the contributions of the Beer Sheva Experiment to regional health care and to the advancement of medical education.

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ACADEMIC PROMOTIONS IN THE UNIVERSITY CENTER FOR HEALTH SCIENCES AND SERVICES

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There are probably few topics in academic life that give rise to more anxiety and emotion than the process and criteria whereby the academic staff of a university are promoted. The problem is particularly complex in a medical school where the clinical staff have service responsibilities and commitments to patient care that are not shared by their colleagues in the basic science departments of the school or in other faculties of the university. This difference is not always reflected in the promotion policy of the university, with the result that the clinician/teacher may be expected to present a research record comparable to that of the basic scientists. An unfortunate consequence of this state of affairs is that the clinician may tend to downgrade his clinical or teaching responsibilities, at least until he has begun his advance up the academic ladder or has achieved academic tenure. One of the main considerations in formulating the promotion policy of the University Center for Health Sciences and Services of the Ben-Gurion University of the Negev has been to avoid such a situation, which would clearly conflict with the basic aims and concepts of the school.

All members of this medical school receive their academic appointments from the Ben-Gurion University of the Negev. The academic ranks, as in the rest of the University, are instructor, lecturer, senior lecturer, associate professor and full professor.

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The Founding Dean of the school recognized that the promotion policy would have a strong influence on the type of individual attracted to the school. It was essential to attract clinical teachers who would be dedicated to the educational and health missions of the school and who would feel assured that this commitment would be given an appropriately high rating by those responsible for their academic promotion.

One of the main ways in which this medical school differs from the other schools in Israel is that the promotions of members of the basic sciences and those of the clinical faculty are dealt with by separate appointment committees. The regular promotion policy and system of the University are followed for members of the basic science departments of the faculty, most of whom receive their salaries from the University. This also applies to the small group of nonphysicians (PhDs) who are employed in various hospital departments and paid by Kupat Holim (Health Insurance Institution of the General Federation of Labor). The ultimate decision on the academic promotions of these two groups of faculty members is taken by the Higher Appointment Committee of the University. The procedure and criteria for these promotions are similar to those at other medical schools in Israel and will not be discussed in this report.

A different procedure, however, is followed for faculty members who are physicians and who have clinical responsibilities in the hospital departments or community clinics. Their promotions are handled by a separate Medical Appointment Committee equal in status to that of the regular Higher Appointment Committee of the University.

SENIOR MEDICAL APPOINTMENT COMMITTEE

With the establishment of the University Center for Health Sciences and Services, an agreement was signed between the University and Kupat Holim, which contained a special section dealing with the academic appointments of the clinical staff. According to this agreement, which was approved by the Senate of the University, a committee known as the Senior Medical Appointment Committee was set up to handle the academic appointments of all physicians (faculty members with MD degrees) in the medical school.

The members of the Senior Medical Appointment Committee include the Dean of the medical school, the Director-General of the Kupat Holim and a number of full professors chosen from the clinical faculty of the school. The committee also includes outstanding physician-scientists from other institutions in Israel, one of whom serves as chairman of the committee. Ben-Gurion University is represented by the Rector of the University, who serves as cochairman, and by an elected representative of the University Senate.

All promotions of the clinical staff of the faculty, at the senior lecturer or professorial level, are initiated, handled and finalized by the Senior Medical Appointment Committee. Most of these physicians receive their salaries from Kupat Holim, but some are employed by the Ministry of Health and a few by the University itself.

The existence of a special Medical Appointment Committee is a unique feature of the Beer Sheva medical school and has undoubtedly had an influence on the promotion policy of the faculty. On the one hand, a committee composed mainly of physicians is better able to evaluate the faculty member's contribution to patient care and clinical teaching than is a general university committee. On the other hand, the fact that the chairman is a distinguished member of another institution, and that the Rector of the University is cochairman of the committee, has helped ensure that the promotion criteria are in step with general University policy and that adequate importance is attached to the research achievements of the candidate.

GENERAL PRINCIPLES OF THE PROMOTION POLICY FOR CLINICAL TEACHERS

In accordance with the promotion policies of most medical schools, the achievements of the faculty members in teaching, clinical practice and research are evaluated. A guiding principle in the promotion policy of the Beer Sheva school has been that the

clinician who balances his activities in the three fields should be as worthy of academic promotion as his counterpart in the basic science departments whose orientation is primarily towards basic research.

A problem encountered by promotion committees in medical schools throughout the world has been to determine the relative weighting that should be assigned to achievements in teaching, clinical service and research at the different levels of promotion. In formulating and applying the promotion policy of the Beer Sheva school, it was felt that flexibility was essential when assessing the faculty member's contribution in each of these fields, and that a synthesis of the physician's activities should be judged rather than the arithmetic mean of his contribution in each field.

The need for a flexible approach seemed to be of particular importance in a medical school where the physician's involvement in patient care would serve as a role model for the students, but in which there was also a critical need to encourage research and to build up a strong basic faculty.

While it was recognized that the major contribution of most of the clinicians in the faculty would be in clinical medicine and teaching rather than in basic research, the clinical teacher was also expected to participate in research leading to publications in peer-reviewed medical journals. Assessment of the faculty member's research contribution is therefore an important part of the evaluation process, especially at the higher academic levels. On the other hand, the aims of the school are such that it is inconceivable that a physician will be promoted to a high academic level on the basis of his research achievements, if these are accomplished at the expense of his responsibilities to his patients in the hospital or community.

GUIDELINES TO APPLICATION OF THE POLICY

While the need for flexibility has made it difficult to define precisely the promotion requirements at the different academic levels, it was important that faculty members have a clear understanding of the principles on which the promotion policy was based. In order to meet this requirement, a set of general guidelines was drawn up several years ago by the present Dean of the faculty and approved by the Higher Medical Appointment Committee. I will discuss some of the more important guidelines, since they emphasize several aspects of the policy that were given special attention by the Appointment Committee over the years.

In the preamble to the guidelines, it is pointed out

that a medical faculty cannot lay down strict criteria that apply equally to each and every teacher. Whereas the faculty member's contribution to research, teaching and patient care will be evaluated in each case, it is recognized that some faculty members will be stronger in one aspect than in another, and that particular achievements in one field may compensate for relative weakness in another. In the case of faculty members who carry a heavy service load, a lesser contribution to research may, for example, be balanced by their achievements in patient care and teaching. At the higher academic levels, however, the expectations are increased with respect to a positive contribution in all three fields.

In conformity with the general principles of the faculty's promotion policy, the guidelines indicate that greater emphasis is placed on the faculty member's contribution to clinical service and teaching than in many other medical schools, but that dedication to patient care will not, on its own, ensure the right to academic promotion. The guidelines give some indication of the expectations with respect to the various activities of the faculty member at the different promotion levels, although no attempt was made to spell this out precisely. Excellence in clinical care and/or teaching would, for example, be regarded as a minimal requirement for promotion to associate professor, but the candidate for promotion at this level would also be expected to show clear evidence of a significant contribution in either clinical or basic research. A candidate for promotion to the rank of full professor is expected to have achieved national or international recognition in his particular field.

The guidelines also indicate that the faculty member's contribution to the administrative needs of the school and to the community at large will be taken into consideration in the overall assessment of his achievements. An important point mentioned in the guidelines, and often overlooked by academic promotion committees, is the question of personal example. Evaluation of the clinical teacher should include not only an assessment of his performance in formal lectures, seminars and bedside teaching, but also the extent to which his personal behavior and attitudes can be regarded as a positive example to his students within the framework of the general aims of the school.

Although the Senior Medical Appointment Committee is very much influenced in its decisions by the promotion policy and guidelines discussed above, it is recognized that there may sometimes be circumstances in which unusual departmental needs may justify a promotion that is not strictly in accordance with the guidelines. The guidelines are not intended

to prevent a flexible approach; on the contrary, they are meant to provide a context for determining to what extent it is necessary to compromise.

EVALUATION OF TEACHING

A detailed discussion of the evaluation of the teaching skills of a university teacher is beyond the scope of this review. The usual procedure at our medical school is that the Associate Dean responsible for coordinating teaching activities in the faculty is asked to submit to the Appointment Committee an evaluation of the faculty member's ability and contribution as a teacher. The Associate Dean is aided in his assessment by the student evaluation of individual teachers, as expressed at the debriefing sessions held at the end of each course. The assessment of the Associate Dean is particularly important in the case of younger faculty members whose impact on teaching will often not be known to members of the Appointment Committee. Prior to their appointment as instructors or lecturers, new faculty members are expected to participate in an orientation workshop at which the aims and teaching policy of the faculty are outlined. In the case of more senior promotions, the candidate's contribution to curriculum planning is also taken into account by the Appointment Committee.

EVALUATION OF RESEARCH

While all members of the Ben-Gurion medical school are expected to engage in research, it is clearly recognized that physicians who are concerned primarily with patient care cannot be expected to produce papers of the same type or at the same rate as their colleagues in the basic sciences.

The promotion guidelines referred to above give some indication of the type of research achievement expected at the different levels of promotion. Evidence of "some research activity" is expected before appointment as lecturer, and of "independent research" in the case of appointments at the senior lecturer level. At the professorial level, the faculty member is expected to have shown ample evidence of his ability to carry out "significant independent research." These are clearly very general guidelines and allow the Appointment Committee to exercise flexibility in assessing the candidate's research contribution.

As in most universities throughout the world, the actual evaluation of research achievements is based primarily on the candidate's list of publications, despite the awareness that this is not always a true reflection of the candidate's research activities. In general, the main assessment of the publications is left to the members of the professional subcommit-

tee. Since these subcommittees are composed of experts in the candidate's major field of interest (see below), it is hoped that they will be in a better position to judge the quality of the publications and will avoid the temptation to merely count the number of papers listed in the candidate's curriculum vitae. Two additional aspects are considered by the Appointment Committee in evaluating the candidate's research contribution and, in certain cases, these may carry even greater weight than the length of the list of publications. The first is the realization that the head of a clinical department who has succeeded in encouraging the younger members of his department to carry out independent research or to publish papers based on their clinical experience may have made a greater research contribution than his own list of publications indicates. A second point taken into consideration is that the interest and enthusiasm that a senior faculty member stimulates when working with his residents and young doctors may be as much a reflection of his creative activity as the number of papers he has published.

DECISION AGAINST A CLINICAL TRACK

In many medical schools in Israel and abroad, the problem of faculty members whose commitment to patient care leaves them little time for research is solved by the existence of a separate clinical track. Such faculty members are eligible for promotion to the rank of clinical senior lecturer or clinical professor. The question as to whether a separate clinical track should be introduced at the Beer Sheva school was discussed at length at a meeting of the Faculty Council a few years ago. Several senior faculty members favored the institution of such a track in which the major weighting in promotion decisions would be given to the candidate's clinical achievements. The majority view, however, was against the creation of two classes or categories of faculty members. In view of the clearly stated aims of the school, it seemed particularly inappropriate that clinician-teachers whose major commitments were to patient care and clinical teaching could not be advanced in the regular academic track even if their research achievements did not match those of their colleagues in the basic science departments.

THE ACTUAL PROMOTION PROCEDURE

Apart from the existence of a separate Senior Medical Appointment Committee, the actual promotion procedure is similar to that in other medical schools in Israel. The recommendation for promotion is usually initiated by the departmental or divisional head. Appointments at the instructor level are decided on by the Dean of the faculty. Appoint-

ments or promotions at the lecturer level are recommended by the appointment subcommittee of the faculty and confirmed by the Senior Medical Appointment Committee.

Appointments or promotions at the senior lecturer or professorial level are handled by the Senior Medical Appointment Committee. In the case of these senior appointments, great importance is attached to the opinion of recognized experts from other institutions in Israel or abroad. For promotions to associate or full professor, an evaluation by overseas referees is regarded as mandatory. The external referees are asked to express an opinion on the professional standing, academic attainments, teaching capabilities and research contributions of the faculty member. When requesting letters of appraisal from the external referees, care is taken to explain the special aims of the Beer Sheva school. The following paragraph in the letter to the referees is intended to serve as a guide to the promotion policy of the school:

Our school attaches great importance to the integration of hospital and community medicine and to the fostering of a positive attitude towards primary health care. In considering the promotion of our clinical staff, we therefore pay special attention to their contribution and achievements within the sphere of hospital and/or community medicine in addition to their research achievements.

The letter to the external referees has recently been modified to indicate that the Beer Sheva school does not have a separate clinical track and that the clinical practitioner and full-time academic researcher are appointed within the same regular track.

Should the Senior Medical Appointment Committee be satisfied that the candidate's record warrants consideration for promotion at the senior lecturer or professorial level, a special professional committee is appointed for each candidate. The committee is composed of three or four experts in the candidate's particular field. The chairman is usually a member of the local faculty, but the committee always includes representatives from other medical schools or scientific institutions in Israel. The professorial committee reports back to the Senior Medical Appointment Committee where the final decision is taken.

EVALUATION OF THE PROMOTION POLICY

No systematic evaluation of the promotion policy has as yet been carried out. This is clearly desirable and should be one of our future aims, although the task will not be an easy one. In his recent "Moshe Prywes Lecture on Medical Education," Evans (1)

pointed out that evaluation of an educational experiment may be a frustrating process since "what is important is difficult to measure and what is measurable is usually not important."

It is meanwhile difficult to draw definite conclusions on either the validity of the basic concepts of the promotion policy or the consistency with which the policy has been applied. Outside observers, and even members of the faculty itself, have often asked whether the declared promotion policy of the faculty has in fact been applied in practice. Two contrasting sets of doubts have been expressed, depending on the personal viewpoint of the questioner. There are those who imply that the major weighting has in fact been given, as in most other medical schools, to the number of publications rather than to the faculty member's contribution to clinical service and teaching. Others have claimed that there has been an undesirable downgrading of the importance of research, and that the emphasis on clinical service and teaching may have a stifling effect on research in the medical faculty as a whole. The fact that the criticisms have been voiced in two different directions—some claiming that we pay no more than lip service to clinical service and teaching, and others that we downgrade research—is perhaps an indication that the promotion policy has been a truly balanced one. More credit has been given for high quality clinical care and excellence in teaching than in many other medical schools, but contributions to research have certainly not been disregarded, particularly in the case of promotions at the professorial level. In some ways, the expectations have perhaps been greater than in other medical schools. On the one hand, clinical service alone has not been regarded as an adequate reason for promotion to the higher academic ranks. On the other hand, a long list of publications has not been accepted as a substitute for clinical and teaching achievements.

Despite their heavy clinical responsibilities, many of the clinical faculty have succeeded in making substantial research contributions, and most of those who have been promoted to the rank of associate or full professor have achieved a high level of scientific productivity. There are, however, faculty members who have not published extensively but who have been promoted to the rank of senior lecturer and, in a few instances, even associate professor on the basis of their exceptional contributions to teaching and to clinical care in the hospital and community.

Since the academic promotions of the clinical teachers are not handled by the regular Higher Appointment Committee of the University, it has been important to avoid the criticism that the pro-

motion standards in the medical school are lower than those in the rest of the university. It was therefore gratifying to hear the then Rector of the University state at a Senate meeting that his experience as a member of the Senior Medical Appointment Committee had convinced him that the promotion criteria of the committee, although different, were not less demanding than those of the regular Appointment Committee of the University. It is this message of "different" rather than "lower" criteria that characterizes the promotion policy of the school with regard to its clinical teachers.

During the winter of 1985-86, the Ben-Gurion University of the Negev invited a group of distinguished academicians from Israel and abroad to conduct an in-depth review of its faculties and academic units. It was encouraging to read in the report of this academic review committee that the standards and criteria used by the promotion committees of the University Center for Health Sciences and Services were high, and that both the clinical and basic science departments were composed largely of teachers and investigators of high caliber.

HAS THERE BEEN A CHANGE WITH TIME?

As the basic science departments have developed and more young clinicians have joined the faculty, opportunities for research have become greater. This has, I believe, been accompanied by a slight increase in the emphasis placed on research achievements by the Senior Appointment Committee. This should probably be seen as a positive development as long as the overall balanced approach is preserved. A more active participation of clinical faculty members in basic or clinical research programs is a positive step in the right direction, provided that the commitment and devotion of the clinician to patient care and teaching do not decline as a result. Special heed must be paid to the danger of creating an atmosphere whereby physician-teachers would feel tempted to join the "publish or perish bandwagon" at the expense of their clinical and teaching responsibilities.

I wish to thank the Founding Dean of the University Center for Health Sciences and Services, Dr. Moshe Prywes, for his help in preparing this review and in particular for his advice on the historical aspects of the promotion policy. I am also deeply indebted to the present Dean, Dr. Shimon Glick, from whose promotion guidelines I have quoted extensively.

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MEDICAL STUDENT SELECTION AT THE BEN-GURION UNIVERSITY OF THE NEGEV

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Key words: Beer Sheva Experiment; medical education; student selection; interview; cognitive and noncognitive characteristics

Among the innovations introduced in the Beer Sheva Experiment, few are as radical, well-known and controversial as the student selection procedure. It has been the subject of invited talks before medical circles in Berkeley and Geneva, Madrid and Stockholm, as well as in Jerusalem, Tel Aviv and Haifa. Responses have been spirited, ranging from hostility through scepticism to enthusiasm, tenors which often accompany scientific controversy about issues that challenge convention. The procedure was adopted after much deliberation, but with considerable trepidation. For those not exactly sympathetic to the Experiment, it was additional evidence that we were setting up a school for medics.

At the time of writing, the 12th class has been accepted in very much the same way, in principle and procedurally, that marked the acceptance of the first class in 1974. Technical changes have been made and the personnel involved has changed, but student selection has been institutionalized and remains essentially the same. This paper is designed to describe the procedure briefly for those not familiar

with it, to consider the problematics, and to evaluate it as best as one can without a thoroughly respectable scientific study.

(In some countries, all candidates who meet a very modest set of requirements are automatically accepted; severe weeding out occurs later, mostly in the first year. We never seriously considered this option. This paper is addressed only to the issues that arise when selection is done before admission.)

PRINCIPLES

Three principled decisions were taken at the very outset, which expressed a radical departure from conventional wisdom in the selection of medical students. These relate to the role of noncognitive factors, the authority and responsibility of the Admissions Committee, and the threshold concept of cognitive factors. Details and concretizations flow from these decisions. Each will be dealt with in turn.

Noncognitive factors

The Ben-Gurion University of the Negev (BGU) can hardly lay claim to originality in its concern about the cut-throat competitiveness, egotism, coldness and the like with which medical students have so often been charged. The desire to admit students characterized by compassion, sensitivity and responsibility was not born in the Negev desert. Conventional wisdom, guiding selection procedures throughout the world, however, is predicated on the primary axiom of selection according to cognitive criteria, i.e., grades and achievement and/or ability test scores. The perspective was shaped by the question: who can be expected

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* The writer served as first chairman of the Admissions Committee for 9 years. Thus he has all the advantages of intimate familiarity with the subject, and all the disadvantages of the committed. The reader is duly warned.

to cope with great competence with the rigorous cognitive demands of medical school? Once this elite is identified, there might be room for looking for other, "softer" qualities.

Our approach was fundamentally different. Our initial question was: What are the behaviors we wish to see manifested by our graduates as practicing physicians, whatever their specialties? Further, given the *raison d'être* of a fourth medical school in Israel, it was incumbent upon us to ask about qualities that might predict to a community medicine orientation. Once these questions are asked, cognitive abilities are seen as an important part of the picture, but no more than that. They are not seen as taking precedence over, as more crucial than, noncognitive factors. The latter have come to be seen as essential in selection, rather than as a residual component. The noncognitive factors are neither to be totally disregarded, nor given minimal weight or are merely for the purpose of weeding out potential psychiatric casualties. They are, rather, to be accorded crucial weighting, to be used as a positive selection criterion and to constitute a *sine qua non* component.

The Admissions Committee

When cognitive factors are the sole selection criterion, the admissions procedure can safely be placed largely in the hands of computers and bureaucratic officials. When additional factors are to be taken into account, faculty members most often are enrolled to evaluate letters of recommendation and autobiographies, or to hold an interview. Since the noncognitive data are defined as adjunct, the duty to judge and vote becomes onerous and adjunct to one's real work. This is not to suggest that it is not taken seriously. But it is hardly a professional role, in the sense that there is scope for autonomy, policy formation, and complexity of choice.

The first Admissions Committee at BGU was handpicked by the Dean, in consultation with the intended chairman. Its assigned mandate was to formulate the policies and procedures for selection in keeping with the purpose and spirit of the school and to be responsible for carrying them out. Thus from the outset, authority and responsibility were vested in the same body. Obviously, it was ultimately to be responsible to the Dean and, when it was formed, to the Faculty Council. In actual fact, its near-total autonomy has been maintained.

The second characteristic of the committee expresses, in its way, the community orientation of the school and the physician/patient partnership conception of health care. From the outset, half its

membership (now 25) were physicians and half nonphysicians. Some of the latter are basic scientists who are members of the medical faculty, others are members of other faculties, and still others are citizens with no university affiliation. Selection is always individual, by persons believed to identify fully with the aspirations and values of the school. The members who are not physicians provide a valuable different perspective. Through them word gets around the entire community: this is a medical school that tries to pick real *menschen* (human beings); it is beyond reproach and has totally eliminated *proteksia* (pull); this is "our" school.

A sense of identification flows from having autonomy. The consequence of accepting responsibility is the willingness to be trained to perform well. The heart of the committee's work is the heavy, concentrated investment in interviewing candidates. However, in order to make policy decisions, to resolve the many concrete issues that arise and, above all, to learn from experience and to prepare for the interviewing, the committee meets throughout the year. A collectivity emerges from a collection of individuals. Over the years, a sense of pride in membership has emerged, camaraderie enhanced by jokes and stories, but above all, by the feeling—warranted or not (an issue to be considered below)—that a crucial job is being done well.

Finally, what is to be noted is that committee members serve a 3-year term, some returning after a few years. Moreover, an ex-member is always called upon to put in a day or two of interviewing. One-third of the members are thus replaced each year. This rotation has ensured continuity, while making room for new ideas and challenges, as well as for an ever-larger circle of faculty and community participants in the process.

The threshold concept

The hidden assumption of most medical schools would seem to be that the goal of selection is to admit potential Nobel prize winners. Alternatively, it is assumed that none but the very top scorers on ability and achievement have the cognitive potential to perform well as medical students and physicians. Despite the massive evidence that the predictive value of scores, within the narrow range of those that allow admission, is at best marginal for even the first years of school, this assumption has continued to guide most selection procedures.

This assumption was totally rejected at BGU from the outset. With full appreciation of the intellectual difficulty, the capacity for self-discipline, and the need for a variety of cognitive skills required for success in medicine, we made the assumption that

these are found among a considerably larger proportion of candidates than is usually thought to be the case. At the time of making this principled assumption, we were fully aware of the fact (and duly afraid) that it was an assumption without documentation.

This is not to say that there is an inherent contradiction between outstanding intellect and the humane qualities essential to the practice of medicine. (The one Nobel prize winner I have had the fortune to meet personally is one of the most compassionate and cultured persons I have ever met.) Our assumption, rather, is based on three arguments. First, a considerably more modest cognitive level than is usually thought to be the case is perfectly adequate for highly successful performance in medicine. Second—if the first is indeed true—by selecting students from a considerably larger pool than is usually the case, one paves the way for the search for those who are outstanding on noncognitive characteristics. We are delighted by a brilliant candidate who is also a fine person. But fine people are not any more frequent among the brilliant candidates. And, third, we argued that those candidates who were top scorers were more likely, relatively speaking, to be attracted to a narrow research career than to community-oriented medicine.

IMPLEMENTATION

Having made these decisions in principle, we were then faced with the difficult task of translating them into concrete practice. How were we to select a class of 50, plus an adequate waiting list, from among the 1,000 to 1,200 applicants? A four-stage procedure was evolved. Over the decade, a variety of details have been modified, but the procedure has remained essentially the same.

Application

The great majority of Israeli young women and men enter army service for 2 and 3 years, respectively, upon graduation from secondary school at about age 18. Thus most candidates are at least 20 (or older, for those who have served as officers), having had a highly significant, maturing life experience. In order to apply, those who have not served (largely religious women, most Israeli Arabs and some disabled persons) must also be at least 20 years of age. The age requirement does not hold true for the one-fifth of the class accepted in the army reserves, who serve as medical officers for 5 years after graduation.

The threshold concept is applied to the use of secondary school grades. Israeli high school students all take national matriculation

examinations in a variety of subjects. In order for an application to be approved, the candidate must have obtained a grade of 8 or better (out of 10; this is the equivalent of the American B) and have taken at least two exams at a 4 or 5 point level (the equivalent of the British A level). This cutoff was determined after analysis of national grade achievement, which showed that approximately one-third of all those with a matriculation certificate (i.e., excluding those who do not complete 12 years of schooling or do not obtain a certificate) reach this level. Having passed this threshold, matriculation grades play no further role in selection.

Cognitive potential

Candidates to Israeli medical schools take a battery of what may loosely be called intelligence tests (although components of knowledge of English and of general knowledge are included). The other three schools use the scores in somewhat different ways; the individual's rank, however, is always crucial. At BGU the threshold concept is applied: a cutoff point is established at close to the 60th percentile. Again, the actual individual test score plays no further role in selection.

Noncognitive factors

The roughly 40% who have passed the second stage are then invited to a personal interview. This interview attempts to assess the extent to which the candidate's personality, values and life behavior are indeed expressive of the sought-after qualities. The interviewers only know that the candidate has passed the two threshold points of matriculation grades and test scores. They have available to them letters of recommendation and an autobiographical account, which are used as tools in conducting the interview. In its initial consideration of how these are to be assessed, the Admissions Committee discussed a wide variety of alternatives: personality tests, group interviews, experimental situations, etc. All were rejected in favor of the personal interview, conducted by a team of two members of the Admissions Committee.

Those candidates who receive high evaluations in the first interview are invited to a second interview, conducted by another team in very much the same manner as the first. "High" is defined as approximately that evaluation achieved by about 35% of the candidates.

Final selection

Candidates are presented at a final session of the entire Admissions Committee according to the order of the sum of their four interview assessments. All

data in the candidate's file are available at this point. Discussion generally centers on those who have not received very high evaluations, particularly when one of the four interviewers is unenthusiastic. Preference is for making beta errors, i.e., mistakenly rejecting the hypothesis that a candidate is good, rather than accepting false positives. (Interestingly enough, this mode of thought is at variance with the usual medical screening mode, which prefers inclusion of cases that later turn out to be nondiseased.) In this manner, places are offered to 50 applicants, and a ranked list of about 20 reserve applicants is prepared. The summed data for the selection process, 1974-83, are presented in Table 1.

It is clear, then, that for those candidates passing the hurdle of the generous thresholds of grades and scores, the personal interview is the cardinal tool of student selection at BGU. We now turn to this issue.

THE INTERVIEW

Few issues in medical education have generated as much heat, from opponents and proponents alike, as the use of the interview in student selection, even when used as an adjunct tool. Unfortunately, heat has seldom been transformed into light. The core of the problem, in our view, is that "the interview" is so global a concept as to make its evaluation impossible. It ranges from a 5-minute encounter between an applicant and a busy professor, totally unprepared, called from his lab or clinic—to what we believe is serious, reliable and valid interaction appropriate to its intended purpose. In our view, the BGU procedure comes reasonably close to being such, and should be evaluated in its own terms, rather than being blanketed with everything else called an interview. We have identified a number of crucial issues which, we believe, are decisive in making the interview a powerful tool and warrant its use.

Who interviews?

Many highly competent researchers are incapable of establishing the essential rapport with a young woman or man that would allow drawing out and fair evaluation. Good clinicians and teachers should

be better at it, but this is not always the case. We have sought those persons, in and outside the faculty, who *a priori* have the potential of being good interviewers. We have, moreover, made it clear that dedication and commitment, both to the task at hand and to the specific values of the school, are essential prerequisites. In order to realize potential, however, skill training is essential. Long before the interview period, many hours are put into evaluating past performance, role playing, exchange of techniques, etc. When the interviews start, new committee members are always paired with veterans.

Whatever the training, we each remain with our individual preferences and biases. These are somewhat muted in the course of committee member interaction, as a common language is hammered out in the pre-interview discussions. Perhaps not surprisingly, given the character of the school, the most dangerous possibility created by use of the interview—its use to discriminate against minorities, including those who have not followed the straight and narrow path of conformity—has never been a problem at BGU. If anything, we have leaned over backwards. Thus the proportion of women and ethnic minorities selected has invariably been a bit higher than these groups constituted of the applicant population (and, with respect to the latter, considerably higher than the proportion who pass the "objective" tests). The atmosphere created in the committee is such that the member who evinced bias against an Israeli Arab, or a woman, or a candidate with a given political or religious persuasion would be subject to severe pressure. We remain with our individual preferences: X is impressed by the candidate who plays music, Y by the army combat officer, and Z by the one who has made it despite a broken home. The saving grace is that four positive evaluations are required for selection. Thus it is the collective, institutionalized process which more than offsets the fallacies of individual judgment. The collective can, of course, and has been wrong. But the chances are fewer when four evaluations constitute the picture, particularly given the often obstreperous independence of most committee members.

Structure of the interview

Each interview follows its individual course, taking off from an issue raised in the interviewer's mind by the autobiographical form or by the written response to three standard questions (on moral dilemma, significant experience, major achievement). Each interviewer develops, over time, favorite questions (which are occasionally coliated

Table 1. From application through selection, 1974-83

No. of applicants	9,781 ^a
Registration approved, took psychometric exam	7,833 (80.1% of applicants)
First interview	3,455 (44.1% of those taking exam)
Second interview	1,127 (36.3% of Interview I) ^b
Selected	408 (36.2% of Interview II) ^b

^a Range of annual number of applicants from 719 to 1,201.

^b Data exclude 1974, when only one interview was conducted.

and distributed to the committee). Each team develops its own pattern of taking turns, but we are all guided by commonalities. Above all, we seek to be aware of the trap of the smooth talker, the charmer. No less a trap is falling for the response to one issue which creates enthusiasm, but is not corroborated on probing. We focus on deeds, on life experiences, and not on the right words. (Woe to the candidate who is dying to be a primary care practitioner in a development town, but who has never gone out of his or her way to do something for anyone or to know anything about people in other social classes or ethnic groups than his own.) From discussion of nonmedical issues, we move slowly to motivations for medicine. (The reader should recall that very often, in Israel, candidates have a "my son the doctor" background, though often reference is to an Arab father.) We shift, particularly for promising candidates, from a relaxed to a more stressful questioning. The interview, never less than 35 minutes and averaging 50, is invariably concluded by asking whether the candidate would like to add anything we should know. Each of the two interviewers then records a global evaluation and evaluations on eight specific traits on a scale of 1 to 5 (in practice nine half-point ratings).

These, then, are the characteristics of the BGU interview. It is, we believe, as well-prepared and well-applied a tool as possible, though we would be the first to agree that it can be improved. Does it work?

RELIABILITY AND VALIDITY

After the 1980 round of interviews, having conducted almost 3,000 interviews, data analysis produced the following results: 1) Without exception, in each year intrateam agreement was far beyond the $P = 0.001$ level. These are not, of course, strictly independent ratings, both interviewers having taken part in the same interview. 2) Evaluations in first and second interviews, conducted by two different teams, were compared in each of the 6 years with two interview rounds. Again, in each year, the correlations went well beyond the $P = 0.001$ level—this, despite the use in the second interview of a small control group, and the relatively narrow range of those passed on for a second interview.

But perhaps the most telling evidence for the reliability of the interviews was the comparison of evaluations of 235 candidates who, rejected in 1 year after having been interviewed, reapplied and were reinterviewed. At most, the second team learns from the candidate (recall that the record is not available) that he or she has been interviewed previously and

not accepted. In this stringent test, the correlations too are beyond the $P = 0.001$ level.

Reliability, of course, is but a prerequisite for validity. Is there evidence for the validity of the BGU selection process, at the heart of which is the personal interview? Does it produce the kind of medical student and physician we set out to produce? Putting the question this way, of course, makes it clear that, short of experimental manipulation, there is no possible final answer, for it suggests that the 6-year curricular and life experience, and the medical practice setting, have no impact on performance—an obvious absurdity. Conceivably, one might argue that the same curriculum, faculty/student relations, etc. would produce the same results with students selected by any procedure. We doubt it, but the reader will have to judge for him/herself. Our contention would be that personality and value variables are largely shaped by the time of entry into medical school. There is shaping, for better or for worse, during the 6 years, but it is not likely to be very profound.

But before turning to the question of validity, let us consider a crucial issue—dropouts. Let us grant for the moment that BGU indeed selects fine, humane men and women, oriented to community medicine. But is this done at a cost of widespread inability to do well by rigorous cognitive medical school standards? After all, some 50 to 60% of our students could not be accepted, by virtue of their grades and test scores, in any of the other Israeli medical schools. (The reader will simply have to accept on trust that our cognitive standards throughout the 6 years are as tough as elsewhere.) Dropout data are presented in Table 2.

Of BGU's first six classes, 22 students (8.9% of those admitted) will not be physicians. Another 8.9% took 7 years to complete their studies. But of the former, nine withdrew of their own volition, none of whom were in danger of failing and all of whom went into different fields of study. Of the 22 who took 7 years to finish, almost half took a year off voluntarily (to travel, to have a child, etc.). Moreover, of the 13 who were clear academic failures, 3 were accepted in full awareness that they were academic risks. Analysis of the matriculation grades and the psychometric test scores (the reader is asked to recall that these contain a far wider spread than in any other medical school) show that neither failures, withdrawers nor repeaters have lower scores than their peers.

If we disregard all these qualifications, and take the most stringent measure, i.e., those not completing medical school in 6 years, we reach a figure of 17.8%. This may be compared to the 15.5% of

Table 2. Dropouts by class, 1974-79

Class	No. of Students entered	Completed in 6 yr	Completed in 7 yr	Voluntarily withdrew	Failed	Percent dropout*
1974	34	30	1	1	2	8.8
1975	34	27	3	3	1	11.8
1976	39	30	6	2	1	7.7
1977	43	35	4	2	2	9.3
1978	49	41	3	0	5	10.2
1979	48	40	5	1	2	6.3
Total	247	203	22	9	13	—
%	100.0	82.2	8.9	3.6	5.3	8.9

* Withdrew + failed.

dropouts only until 1966 at the medical school in Jerusalem (1). The latest American data (2) show that 11.4% of medical students in the 1970s were dropouts or repeaters in 4 years after having completed 4 years of college. This most authoritative study predicts a rise to 15% (3). Interestingly enough, among its most striking proposals we find the following (3): "Determine the minimum threshold of academic ability needed to succeed... and then select students above that threshold on the basis of personal qualities without regard to their relative academic standing." They recommend as reasonable a 2.7 grade point average in contrast to the much higher one in current use (4).

Are BGU students and graduates, then, a different breed? By the very nature of the question, there can be no hard, scientific answer. Other papers in this volume, discussing the *Graduate Program* in primary care, suggest as much. Many faculty members who come to teach the students with much scepticism about the admissions procedure have become converts. The committee members are, of course, largely enthusiastic about their choices (but also occasionally rue their mistakes). Perhaps most important of all, a self-image of BGU medical students as being different has emerged. The most consistent "complaint," voiced with pride, of graduates coming home to receive their MDs after internships throughout the country, is that department heads invariably expect more of them than of their peers from other schools. Coming closest to any objective evaluation are two sources of reports. First, there have been several dozen visiting professors from Israel and abroad, who uniformly are enthusiastic, above all, about the attitudes, values and behaviors of students. Second, in each class, between the fifth and sixth years, exchange programs bring BGU students to elective programs abroad. Formal reports have consistently given the same picture, while expressing satisfaction with cognitive and instrumental competence.

The BGU medical school selection procedure is a tool, not a goal. Whatever investment, particularly emotional, there has been, I believe that faculty pressure would inevitably have swelled in protest and cast it aside had not the great majority been persuaded that it works. This may happen in the future. As of now, it does not seem to be in the offing. Hopefully, what other schools can learn from our experience is that the "interview" is not magic; what seems to work is a very carefully thought-through procedure, using a very specifically designed interview.

One final word should be said about cost. The actual financial outlay is probably considerably less than the most computerized procedure in existence. No personnel have been hired to work on selection. Secretarial duties have somehow been assumed by personnel with other responsibilities. Roughly, an annual total of about 1,700 hours are invested in interviewing, committee training and discussions, and the work of the committee chair throughout the year. No financial compensation is made. For those from other faculties, or from the community, it is a labor of love. For those from the medical faculty, there is some price in hours devoted to clinic or research, though less than might be, for somehow it is always the busiest people who find the time to devote to selecting the coming generation of physicians.

THE POWER OF THE MYTH

Myths may be grounded in objective reality, at least in part. But to whatever extent this may be the case, they have a motive power of their own. In our case, there has come into being a widespread belief among faculty and students that, given our admissions procedure, we select a different breed of students: more humane and responsible, less individualistic and competitive, more compassionate and concerned, more oriented to family medicine and community care, and so on, when compared to most

other Israeli medical students. I suggest that this comes to be a self-fulfilling prophecy.

There are, of course, those who tend to the extremes: the selected candidate who is really all that Beer Sheva looks for and who will behave accordingly, no matter where, and the one who turns out to be a sad mistake. Having acted superbly in the interview, true colors come out as a student, no matter what is done. But for the great majority, the very labeling provides a push in the right direction. For some, this tendency is already internalized, and the myth reinforces it. For others, the myth influences external behavior.

Given that the curriculum, which from the first year brings the student into frequent contact with patients in a wide variety of clinical settings, requires group projects and sets up mechanisms for student responsibility, the myth has institutionalized channels through which to operate. It is put to the test. Obviously, should the Admissions Committee make too many mistakes or should, for some reason,

a class leadership come into being that dissipates the myth, it will not last for long. But it is our sense that what many students and faculty members refer to as the "Beer Sheva spirit," after more than a decade (even if the reference to it is often to note that it is in danger of being dissipated), expresses the myth initiated by the admissions process.

I wish to take this opportunity to thank Drs. Naomi Meyerstein and Viola Torok, who succeeded me in chairing the Admissions Committee, for so successfully carrying on the traditions and values that my colleagues built, while maintaining a fresh, healthy scepticism and constant process of reexamination.

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Sir John Brotherstone

University of Edinburgh, Edinburgh, UK

Excerpts from his letter, June 1, 1982

"I had a number of discussions with your young graduates and was most impressed. In a sense, their dilemma arises from the very success of your programme. You have instilled two significant ambitions into them which may bring a kind of internal conflict for them.

On the one hand you have succeeded in giving them a sense of the needs of their communities and their responsibility to help to meet these needs. I felt that you have achieved this more effectively than anywhere else I have encountered. In this your project has been very successful.

But on the other hand you have also instilled into them an ambition to practice medicine at the highest level of quality of which they are capable."

TEACHER TRAINING AND FACULTY DEVELOPMENT IN MEDICAL EDUCATION

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Teacher training is gradually becoming prevalent in medical education. A variety of training methods is used, ranging from independent competency-based modules (1) to systematic didactic courses (2). The prevalent method, however, which is also the most recommended one for in-service teacher education, is still the short training workshop (3, 4). Some evidence suggests that even a rather short workshop improves the quality of instruction, probably by increasing the teacher's self-confidence (5). Nevertheless, almost no long-term and wide-range evaluations have been made of the effectiveness of the various training methods and the duration of their effect. Teacher training thus remains the province of each institution, which develops its own program, often based upon beliefs rather than on facts, and on contingency rather than needs.

The following is a description of a multiphasic teacher-training program that has been implemented by the University Center for Health Sciences and Services, Ben-Gurion University of the Negev, (BGU) during the past 5 years. The program is based on the assumptions that different teachers have different needs and expectations, that no single format can meet all these needs, and that training in didactics and in instructional methods should be preceded by attitudinal change. The program acknowledges the great variability in teachers' abilities, competencies, needs and wishes. It also reflects the concept that training should be stepwise, gradually progressing towards mastery through repeated reinforcement.

Further, the numbers and characteristics of the participants are presented; and finally, the program is evaluated by two independent methods that relate to personal growth on the one hand and faculty development on the other.

THE TRAINING PROGRAM

The program includes three phases, and an additional fourth phase is planned for the near future. The first phase aims at enhancing the identification of the individual teacher with the institution, its philosophy and its educational approaches (6, 7). This phase thus appeals to the attitudinal domain.

The second phase introduces the teacher to the educational language, concepts and methods. In addition to the acquisition of this generic knowledge, an attempt is made in this phase to develop the participants' self-acceptance as teachers, rather than as professionals who are obliged to teach. It is assumed that this role/profession conflict (8) is more pronounced in medical teachers than in other academic teachers because of their strong professional identity, service orientation and partial detachment from the academic, scholastic environment of the general university. The second phase thus addresses both the cognitive and attitudinal domains. It does not, however, provide the teacher with specific skills for instruction. These are acquired in the third phase, which offers a variety of specific workshops, each designed to improve a specific instructional skill. The third phase thus refers mainly to the psychomotor domain and capitalizes on both the occurrence of attitudinal change and the acquisition of the knowledge base achieved in the former phases (9).

The fourth phase has not yet started. It will aim to

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combine all three domains, the cognitive, attitudinal and psychomotor. The teacher will be expected to acquire additional detailed educational knowledge, to further develop instructional abilities and skills, to train other teachers and to conduct research, as well as to develop a new self-perception as a future educational leader.

The four phases may also be illustrated in a different way: the first phase presents the framework within which the teacher will perform. The second phase introduces the teacher to a set of educational "building blocks" and teaches him or her the rules by which these blocks may be interlocked to form constructions. The third phase enables the teacher to use the blocks to construct his/her own structure within the framework. The fourth phase develops the ability to create frameworks and to modify them.

A description of the workshops in the program follows. Fig. 1 summarizes the program and illustrates its multiphasic structure.

The first phase

The first phase is a 2-day *Orientation Workshop*. The participants are 10 to 15 faculty members of varying backgrounds, experience and seniority from various clinical and scientific disciplines. Most of them are new to the faculty. The workshop is based on small group activity. Each group of four to six participants

tries to identify health needs and to delineate in rough outlines an ideal medical school that may meet these needs. This imaginary scheme is then confronted with the BGU philosophy, history, structure and curriculum. Within this framework information is provided on the various facets of the medical school's life, including open discussions with the Dean, senior faculty members and students. The expected outcome of the workshop is attitudinal change. The teacher finds out that the institutional objectives are not arbitrary, and that the curriculum indeed stems from defined objectives and meets real needs. Moreover, the novice teachers discover that many of their own ideas and suggestions are incorporated into the curriculum, and that their further involvement is sincerely welcomed. The educational approach of the school is thus no longer perceived as capricious innovation for its own sake, but rather as an understandable solution to well-defined problems. Participation in this phase is a prerequisite for academic promotion.

The second phase

The second phase is an intensive 3-day workshop entitled *Basic Instructional Skills*. The second phase also hosts a multidisciplinary assemblage of teachers, working in small groups, as is the case in the first phase. The workshop is modularly struc-

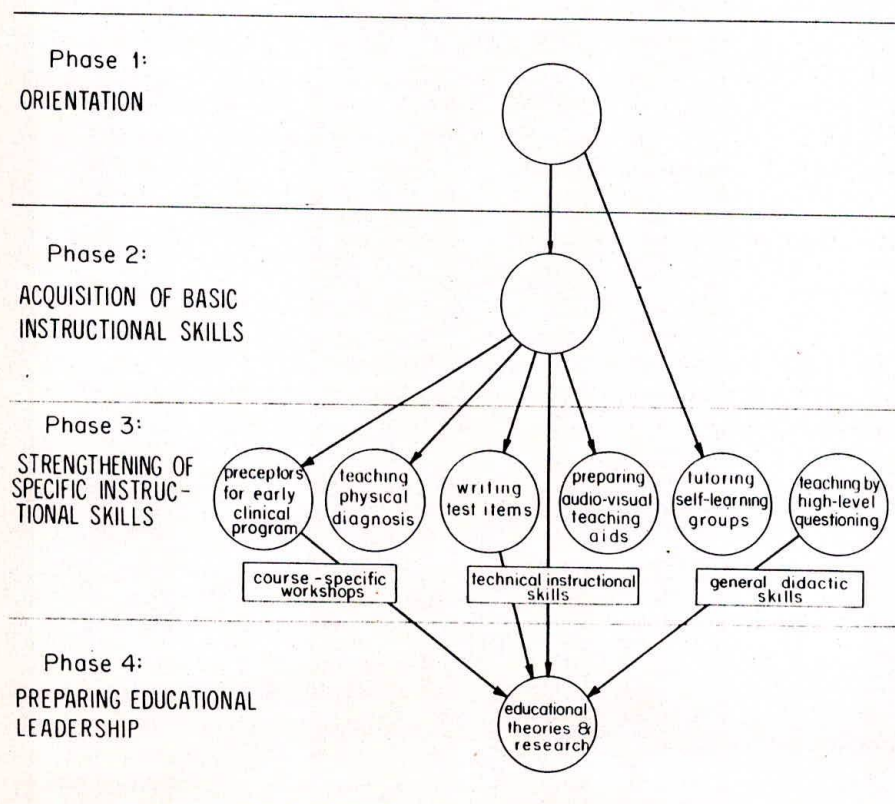


Fig. 1. A multiphasic teacher-training model.

tured. Each module includes a written or audiovisual simulation related to a single concept. This triggers small-group activity in which participants both accomplish a structured task and create their own solution to a problem. The group work is followed by a plenary discussion and is summarized by a short lecture. The concepts that are covered include formulating instructional objectives, selecting appropriate instructional methods, defining subject matter for learning, and selecting appropriate student evaluation procedures. These modules, when organized in sequence, comprise a systematic approach to instruction, both on the macro level of curriculum design and on the micro level of the instructional unit (10).

The module devoted to instructional objectives illustrates the process. The group starts by roughly delineating a multidisciplinary course of its choice, and then elaborates on its objectives. The product is presented to the plenary for feedback, which is summarized by a short lecture on purpose, use and formulation of objectives. On this basis, the group then reformulates a given set of improperly stated objectives, which are also scrutinized later in the plenary. A summary discussion on the interplay between objectives, method, subject matter and evaluation summarizes the module. The rephrased objectives will later serve the group for selecting instructional methods and evaluation measures. At the end of the second phase each teacher is expected to be able to identify his or her own needs and interests to be addressed in the third phase.

The third phase

The third phase offers four different workshops of 3 to 4 days each. The first one is entitled *High-Level Questioning*. It aims to improve instructional behavior in two respects: The first is to replace the traditional lecturing modality by a pattern that elicits students' self-initiated verbalization (11). The second is to both use and stimulate the students to use the highest possible cognitive level in their verbal exchange (12). The workshop hosts 8 to 10 participants. During the first day, they practice intensively the skills of identifying cognitive levels of given questions using Bloom's taxonomy (13), raising lower levels to higher ones by reformulating given questions, and composing new questions on various levels. During the following 3 days, each participant presents a 15-minute lesson each day to his peers. The teachers are encouraged to use the same content area and the same method they use in their real-life teaching. On termination of the presentation, the group provides feedback to the presenter, specifically relating to his or her success in stimulating

student discussion by proper questioning. Following this, the presenter leaves the group for 30 minutes of private review of his videotaped performance with an educationalist. On the last day, all three daily performances are reviewed, enabling the teachers to evaluate their progress. This microteaching technique has long been adopted and proven effective in teacher training in general education (14).

The second workshop in this phase prepares tutors for self-learning problem-based instruction (15). The expected behavior of a tutor requires a major departure from the traditional teaching patterns. Unlike a teacher, the tutor is neither the source of information nor the leader of the learners (16). This situation is threatening to many teachers and requires aggressive behavior-modification training methods in order to achieve behavioral change within 3 days. For this purpose, both group dynamics and microteaching techniques are used. The 8 to 10 participants, representing various disciplines, act out, in turn, all of the following roles: as a learner in a group, solving an unknown problem taken from a discipline other than his or her own; as a tutor to the peer group, which studies a problem; as a member in the group, which provides feedback to the acting tutor on his performance immediately after the learning session; as a moderator of the peer group, which provides this feedback, both directing the discussion and protecting the feelings of the acting tutor; and finally, as a personal instructor to the acting tutor, either in private or in front of the group, helping him to gain insight into his performance. Each participant also has an opportunity to discuss his own performance in private with an educationalist while reviewing the videotaped tutorial. It may be noticed that the workshop oscillates between here-and-now and there-and-then, as well as between the processes of learning new subject matter, learning how to tutor, and training another tutor. This "multiple layering" considerably increases the vigor of the workshop. It is hoped that the requirement to apply the nondirective, nonimposing mode of instruction to so many different situations may increase the transferability of the newly acquired skill to real-life educational activities.

The third workshop offered in the third phase develops the skill of writing test items. This 3-day workshop hosts up to 20 teachers, preferably from a few disciplines. It is structured in modules, each devoted to a different aspect of evaluation, such as various formats of test items, their cognitive level and the mental processes that are actually evaluated by the item. Other issues addressed are scoring, item analysis, reliability and validity. Each module includes a short presentation, a group exercise on

gatory first one. This may indicate a real need, keen interest, and a good reputation of the program.

Table 1 shows a small group of teachers who completed all phases of training. These form the nucleus of the future educational leadership of (BGU). The fourth phase of the program, mentioned earlier, will begin when their number reaches a critical mass, hopefully in the near future.

EVALUATION OF THE TRAINING

The above-mentioned lack of systematic, quantitative assessment of the effectiveness of teacher-training programs is due to several factors. The most important of these is the lack of clear objectives for the training, which stems from lack of criteria for good teaching (17). Still another hindrance is the large number of confounding variables that arise during a longitudinal follow-up of training, such as changes in the teachers' status and seniority or in the curriculum, instructional methods, class size and the like. Nevertheless, three major evaluation approaches are used. It should be noted that these are in addition to the participants' end-of-workshop questionnaires, which invariably reflect a high degree of satisfaction and can hardly be considered an evaluation. The first approach is a pre-post testing, usually written before and immediately after the training, followed by a retest after a period of time (17, 18). Such evaluation may reveal only the cognitive component of the training. It does not reveal actual teacher behavior and says little about his or her attitudes. Pre-post testing is thus used in BGU for training rather than for evaluation purposes, and, therefore, it is anonymous.

The second approach to evaluation of training is based upon students' questionnaires relating to posttraining teacher performance (19). The strength of this approach is that it relates directly to performance, yet it may bear a price in the teacher-student relationship. It was also shown at BGU that internalization and implementation of nondirective tutoring or questioning skills taught in the workshops sometimes received negative response from students who were not prepared for the abrupt change in the instructional method (20).

The third approach to evaluating the outcomes of teacher training utilizes direct observations of performance, either live or videotaped (17, 18, 21). Different authors, however, recommend different criteria for the observations. The teachers' behavior, which was monitored in BGU for assessment of training, relates to some of the objectives of the training specified earlier, namely: activation of students and raising the cognitive level of the lesson. The method of observation is described in detail

elsewhere (22, 23). It included monitoring of both the lesson time spent by teachers' talk compared with the time students spoke, and the kind of verbalization (self-initiated, responses to questions, asking questions), as well as its cognitive level. The combination of these parameters indicates the extent of problem-solving activity in the class in contrast to passive acceptance of factual knowledge. The shift in teachers' behavior following the training reflects the achievements of its goals.

The results of such repeated observations on 60 teachers for 500 days reveal a most significant change in teachers' performance. The data, which are presented elsewhere (22, 23), show that the activation of students both increased and was sustained at the new, high level for the entire 2 academic years of observations, indicating establishment of new instructional patterns. The cognitive level was also significantly raised, but the new level was maintained only for 1 year, indicating a need for reinforcement at this time.

The authors wish to suggest an additional, non-conventional approach to assessment of teacher training. This is based upon the changes in teachers' educational responsibilities following the training. For this purpose, a role of "educational leader" has been defined by meeting any two of the following three criteria: 1) The teacher is also a coordinator of a major course, providing guidance to a number of other teachers. 2) The teacher has developed an educational innovation which may be an instructional method, evaluation instrument, integrative course, etc. 3) The teacher assumes an active role in and contributes to one of the educational decision-making committees or task forces. This approach thus relates to the outcome of training on an institutional rather than an individual level.

Using these criteria, 128 educational leaders were identified during the screened period of 1980-85. Thirty of these assumed their roles during the early, formative years of the school and were defined as the "founding fathers." Fifteen additional teachers were hired specifically for educational tasks, which means that they possessed the leadership qualities before joining the faculty. Of the remaining 83, 21 teachers (25.3%) undertook their educational responsibilities shortly after the training. It may be said that they were discovered in the workshops. Table 2 summarizes the faculty development aspect of teacher training at BGU.

It is not suggested that the training allots leadership qualities to individuals. It is more probable that existing creativity, instructional competencies and administrative abilities were channeled to educational avenues by the training. Such "discovered"

given material, a plenary discussion composing test items and a summary lecture. Nonconventional evaluation instruments are briefly described, and criteria for selecting a particular instrument are both discussed and practiced.

The third phase also offers a workshop for preceptors instructing first and second-year students in the early clinical program. This course-specific 4-day workshop is devoted primarily to the teaching of communication skills. The training methods include a number of role-playing sessions followed by group discussions in which the "patient" and the "interviewing student" may reveal their feelings and expectations from the "preceptor," while the observers may provide more objective feedback. Role-playing sessions with real students are interwoven into the workshop. Also, an overview of the entire early clinical program enables each preceptor to regard his or her part in the teaching in a wider context.

Finally, the third phase includes a number of *ad hoc* miniworkshops of one or two sessions each on specific issues, such as teaching physical diagnosis, tutoring students who follow up a family, improving communication skills of family practice residents, etc. These miniworkshops are set up in response to an expressed need of a group of teachers. In a sense, those extracurricular workshops are boosters that reinforce previously acquired skills.

The fourth phase has not yet started and will not be discussed here apart from mentioning that it aims at a small selected group of teachers who have been

through all previous phases. They will be trained to become future educational leaders in the fields of curriculum design and management, educational research and teacher training.

RANGE OF PARTICIPATION

All workshops are offered several times each year. The attendance is voluntary, except for the orientation phase which is conditional for promotion. Participation is usually self-initiated. However, teachers may be recommended for training by chiefs of services, heads of departments or course coordinators on the basis of observed need to improve performance. In both cases, the teacher may take part in a workshop only if his or her service obligations permit it. In spite of this restriction, 304 faculty members have taken part 470 times in workshops during the 5 academic years between 1980 and 1985. This figure constitutes 62% of the 490 scientists, physicians and allied professionals who held faculty appointments at any time during this period.

Table 1 presents the background of the participants and the attended phases. The table reveals a high participation rate in disciplines that are not traditionally found in the front line of medical education. BGU philosophy may, perhaps, account for the high involvement of allied professionals (included in Table 1 under "Others") and of family practitioners. It does not explain, however, the frequent participation of basic science teachers and of surgeons. Further, the data indicate higher participation in the voluntary third phase than in the obli-

Table 1. Participation in teacher training program

Discipline	Rank of participants			No. of workshops attended				Phase ^a		
	Senior	Intermediate	Junior	1	2	3	≥4	1st	2nd	3rd
Internal medicine	8	21	18	29	14	3	1	17	9	45
Surgery	5	18	31	31	18	3	2	25	20	39
Pediatrics	2	13	22	32	4	1	—	15	8	20
Obstetrics-Gynecology	—	3	17	15	4	1	—	9	7	10
Psychiatry	1	4	21	18	5	3	—	15	15	7
Family medicine	2	7	15	11	7	1	5	4	10	35
Basic sciences	4	16	24	17	16	7	4	22	23	42
Others	6	11	35	35	15	1	1	15	13	45
Total	28	93	183	188	83	20	13	122	105	243

^a 1st phase is Orientation; 2nd is Basic Instructional Skills, and 3rd is High-Level Questioning.

Table 2. Educational leaders "discovered" in the teacher-training workshops

Discipline	Number of educational leaders			Discovered in workshops	
	Total	Excluding founders	Discovered in workshops	% of total	% of new
Internal medicine	31	22	6	19.4	27.3
Surgery	17	13	3	17.6	23.1
Pediatrics	15	13	1	6.7	7.7
Obstetrics-Gynecology	7	6	1	14.3	16.7
Psychiatry	7	3	1	14.3	33.3
Family medicine	13	10	6	46.2	60.0
Basic sciences	26	10	2	7.7	20.0
Others	12	6	1	8.3	16.7
Total	128	83	21	16.4	25.3

educational leaders were drawn mostly from junior and intermediate ranking staff rather than senior members, suggesting that perhaps junior teachers, including residents, are underestimated in medical education.

SUMMARY AND CONCLUSIONS

Many components of the described teacher-training program are implemented elsewhere (2, 4, 6, 8, 16); however, two features of the BGU program, when combined, make it unique. One is the timewise hierarchical structure, which enables gradual acquisition of instructional skills, progressing from generic to specific (9) and from curricular generalities to particulars of a course and of a lesson. The teacher him/herself determines the pacing. Opportunities to implement already acquired skills precede the development of additional ones. Moreover, the program acknowledges individual differences, and thus offers a variety of themes and training methods to fit personal needs and expectations.

The second feature is the emphasis placed throughout the program on the motivational aspects. Indeed, the term "training" becomes alien to the program. Its very essence is to create personal involvement of every trainee on both emotional and practical levels. The individual is guided to become a member in a multidisciplinary team, working together towards an understandable and worthwhile cause. The involvement of the teachers is encouraged and welcomed. When this feeling is combined with the realization that education is a discipline in its own right, a feeling of belonging to both the institution and to the teaching profession arises. Such feelings might well be a prerequisite for any educational innovation (7). The high proportion of educational leaders who emerged from the program illustrates these two features. Personal growth and institutional development are intertwined.

The BGU training program has been rigorously evaluated and has proven to be effective. However, continuous assessment must be instituted and main-

tained. Such formative evaluation may also meet the requirement of an ongoing on-the-job reinforcement (17). Nevertheless, BGU cannot yet afford further expansion of the program—this will have to wait for the graduation of the fourth-phase trainees.

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"The medical education programme at Beer Sheva is built upon the strong humanistic tradition of progressive faculties elsewhere. Upon brief encounter, it aspires to and apparently achieves a modification in the career perspectives of its graduates. Its chances for success or failure lie not so much within itself and its recruitment of an ideologically passionate and committed staff, as in those matters which are well beyond its control. These include: 1) the inevitable changes through time in the composition of its staff; 2) the prevailing medical division of labour accentuating specialist careers; and 3) the inability of a single medical faculty to restructure the prevailing health system in terms of establishing family doctor/specialist quotas (as in the case in Canada or the UK) or providing equitable financial career incentives. Beyond these, there is the stigma that the 'family doctor' is a disabused career in the eyes of the majority of Israel physicians (specialist/family doctor ratio of about 3 or 4:1) with the exemplary Beer Sheva medical education programme characterized by physicians elsewhere in the nation as Israel's 'feldsher' [medic] school.

Despite this invidious caricature, the Ben-Gurion Medical School at Beer Sheva is the most strongly committed of the nation's four faculties to the concept of comprehensive social medicine teaching. Indeed, this commitment is believable and impressive. It is strongly reaffirmed by senior clinicians and all levels of medical students (first through final years). In addition, this Faculty appears to have been highly motivated by the passion of its academic leader, Dr. Moshe Prywes, who left the Hebrew University to set a new course of medical education in the Negev. Forty percent of the graduating class are prepared to spend a year of medical service in underserved areas of the Negev..."

STUDENT-FACULTY INTERACTIONS: A MODEL OF ACTIVE STUDENT PARTICIPATION

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"There will be no 'you' and 'us' at this school, only 'we'." This was the opening sentence at the Dean's first meeting with the students in July 1974 on the occasion of the opening of the medical school, and at many meetings since then. To prove this point, the faculty's founders set out to encourage student participation and input into the program and to create an appropriately informal and collegial atmosphere. Subsequently, during periods of crisis and tension in student-faculty relations, the students sometimes poked fun at this slogan and threw it back at the faculty. Nevertheless, this Beer Sheva spirit has survived, with slight modification, throughout the school's history.

Was this idea of student participation in the creation of this new and experimental school part of the school's unique ideology or only a means of getting better cooperation from the students? Most probably it was a combination of both; but whatever the reason, this framework deserves consideration and analysis.

THEORY

"Student participation will evolve into a deeper, more intellectual and more mature factor in the shaping of social and academic systems of medical educational institutions. One outcome which we are already witnessing, of the campus rioting at the end of the sixties, is a kind of sublimation of feelings and relationships within the teacher-student community, where each group has discovered that it has a lot to

learn from each other. The main change will be to give our students the feeling that the medical school also belongs to them and that they, equally, belong to it." This paragraph, extracted from "A look to the future" (1), was written in 1972 by Dr. Moshe Prywes who, a year later, became the first Dean of the Ben-Gurion University Center for Health Sciences and Services, and reflects the basic idea behind the role given to the students in this school.

In selecting students who would benefit most from the school's educational philosophy and program and who would implement its goals, more than 1,000 applicants for 50 available places are evaluated annually not only by their academic achievements, but also by their personality, values and intellectual qualities. The Admissions Committee includes 10 faculty physicians and 10 laymen from the community (2).

The main goal of this system is to create an atmosphere in which the risks of innovation are accepted by both teachers and students. From the moment the students arrive at the medical school, they are encouraged to participate in the planning, implementation and evaluation of the curriculum. This atmosphere contributes to the development of the capacity to respond continuously to feedback, and to monitor progress. The new cohorts of students do not allow the program to stagnate but keep the faculty integrated with regard to the institutional goals. The students also acquire experience as constructive critics, which they apply to their work in various health settings. The students are not permitted to merely evaluate critically, but are required to participate in designing corrective measures and implementing them (3). The imposition of such

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responsibilities on the students from the start strengthens their feeling of being an integral part of the school.

The faculty pays the price of having students intrude on its meetings, criticize its activities and decisions, and disrupt the traditional barrier between teacher and student. In return, it earns the students' cooperation and feedback in its innovative and sometimes experimental programs. The students pay a price mainly by losing the valuable time consumed by these activities, but profit by having the opportunity to voice their opinions and suggestions and thereby influence the course of events. They also obtain invaluable training in medical education, institutional operation and interpersonal relationships early in their professional careers.

METHODS

The student-faculty interactions occur at three levels—faculty, class and individual. At the faculty level, students are represented in most of the faculty committees. These include the Faculty Council, the Student Selection Committee, the Steering Committee, the Curriculum Committee and the Regulations Committee. The student representatives are chosen by the local medical students' union, to which they also report. The students have no voting rights on the committees, but their suggestions, questions and criticisms are usually taken seriously.

At the class level, students participate in two types of activities. The first is via representation on the coordinating committees for each year, which are responsible for planning, coordinating and evaluating the program of studies for each class, as well as for mediating between the students and faculty when problems arise. The student representatives participate in the bimonthly meetings, report to the committee on problems arising in their class, help the committee find solutions to the problems and report back to the class on these activities. One of the senior members of the committee serves as student advisor to the class and is expected to help individual students solve academic or personal problems.

The second activity at the class level, which is more intensive and activates more students, is the participation at debriefing meetings during and/or after every course. At these meetings, the teachers, students and representatives of the Curriculum Development Unit and the coordinating committees for each year evaluate the course and submit suggestions for improvement. These sessions are designed to ensure the adequacy of the curriculum in meeting the students' learning needs. The students provide feedback to the teachers on the basis of surveys conducted among their peers.

At the individual level, students may be involved in the tutoring of other students, in helping course coordinators organize courses and even in setting up and teaching courses themselves. These activities are in accord with the students' qualifications, and the students in turn are paid. One good example of such involvement is the first aid course given to first and second-year students, which from the outset was planned and taught almost exclusively by students who had served in the army as medic instructors.

Extracurricular activities, which involve both staff and students, include commencement celebrations (when the new class is welcomed), the farewell party for the graduating class of each academic year and a joint Purim party with masks and costumes.

RESULTS

Evaluation of any new technique or educational approach should be based, as far as possible, on objective and unbiased data. To my knowledge, this subject has never been systematically analyzed in our institution, and I shall have to rely on my personal impressions (both as an ex-student and presently a staff member in the faculty) of the impact of the above approach on the relations within the faculty. I shall consider the first 13 years of the faculty's history in three phases.

1) The phase of "creation," which encompasses the first two or three classes throughout their 6 years of medical school. This phase was responsible for establishing the basic curricular goals and structure and for establishing standards and norms of behavior. Both staff and students were filled with excitement and naivety, despite the knowledge that they were acting as guinea pigs in this new school. Most (though not all) were prepared for the consequence and eager to prove themselves. There was an atmosphere of openness for change. As a result of this attitude and because the faculty was still small and intimate, the personal relations between student and staff were warm and rather informal. Emphasis was put on staff accessibility, flexibility and responsiveness to the needs of the students. There were several crises in these relations, which were exacerbated by administrative and educational errors made by the faculty as well as by the great anxiety and insecurity exhibited by some of the students. Not all the staff members were happy with the power and privileges that were given to the students, and some claimed that too much emphasis was put on student evaluation of teachers and courses. However, the general attitude remained one of optimism and satisfaction.

2) An "intermediate phase," which encompasses the ensuing classes, was more problematic. Many

students enrolled in this school with high expectations, after having heard such glowing reports from upper classmen. Unfortunately, several changes had already occurred in the faculty: it had grown bigger and less intimate, initial enthusiasm had decreased, and bureaucratic procedures had been instituted. In addition, a reshuffling in the administrative personnel accompanied a change of attitude towards faculty-student relationships. As the first classes were graduating and embarking upon their new role as physicians, the faculty could at last relax, resulting in innovative fatigue. Furthermore, the students themselves were of a new generation—less enthusiastic for experiments, and less tolerant of change and uncertainty. The students had developed a new concept of the faculty, with a clear differentiation between the academic and administrative staff. Relations with their teachers remained excellent and unique. Faculty were regarded by and large as open-minded, available with little formality or delay, and ready to help those in need. However, the administrative staff was viewed differently. Students now felt as if the administrators had become more detached, formal, bureaucratic and inflexible. There was frustration because of the feeling that despite their participation in faculty committees and activities, the students' influence on curricular changes was limited (a feeling not always justified, in my opinion). Logistics and academic mishaps were less well tolerated. Although the students continued to participate in all the faculty activities as before, an atmosphere of mistrust developed. This atmosphere differed in its intensity from class to class and tended to improve as the students entered their clinical years.

3) A phase of "stabilization," which is only now beginning, is the third and hopefully the longest phase. Following the ups and downs of the first decade, a new equilibrium seems to be evolving. The students have acquired more realistic expectations, while the faculty has become more aware of the students' distress and frustration and is making an effort to rectify the situation. Some of the factors that had earlier been a cause for tension, such as the quality of teachers and courses, shortage of lecture halls, student promotion regulations, and the character of examinations, have been solved or improved. The Beer Sheva spirit is still present, though in a modified way, and neither students nor faculty are ready to give it up and revert to the pattern of student-faculty relationships of more traditional medical schools.

DISCUSSION

Medical educators' growing concern over the high

level of student stress has been accompanied by a shift in their conceptualization of the problem. Student stress is increasingly seen as a problem resulting from the individual's interaction with the learning environment and not as an indication of personal deficiency (4).

Rogers, in a pessimistic article about today's medical education (5), describes his dismay during a session with a group of medical students in a school where he was serving as a visiting professor.

"I told them that, after overcoming my initial terrors, medical school has been an unadulterated, intellectual joy and described how being treated as a colleague-in-learning by my faculty had rapidly moved me toward adulthood... The message from the students was simple and monotonous. They felt they were being lectured to death. It was their view that from 8 AM to 6 PM every day, they sat passively while faculty, whom they did not know and who did not know them, spewed enormous volumes of facts at them. There were blistering testimonials about the poor quality of lectures, about the lack of faculty interest in them as individuals, of dreary, never-ending series of quizzes, tests and other bracings, of insufficient time for study, of the absence of personal contact with the faculty, of school unresponsiveness to their needs or their complaints... They vigorously denied that any real discussions had taken place to explore the root causes of the problem."

He suggests that most medical students nowadays do not enjoy their studies in medical school, and proposes his ideas on how to change the situation.

There is no doubt that the Beer Sheva medical school has made a genuine and successful effort in forming a unique pattern of the student-faculty relationship, which emphasizes support goals as well as output goals (6). The students' role in this relationship is one of active participation, in contrast to the passive role given to students in most traditional medical schools. However, several questions remain: 1) What effect does this pattern have on student and staff satisfaction and involvement in the medical school? 2) Does it influence the graduates' quality as doctors? 3) Can this climate be maintained in the long run, or will it fade as the faculty ages and becomes well established? 4) What is the cost-benefit balance in terms of student and faculty time, money and expectations? 5) Can this model be copied and adopted by other, more traditional faculties? 6) Will the school's graduates have sufficient commitment and satisfaction to stay in Beer Sheva and perpetuate the existing climate? I feel that these and other questions are important and deserve to be studied.

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THE DEBRIEFING METHOD OF CURRICULUM EVALUATION: 13 YEARS' EXPERIENCE

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The evaluation of teaching and learning processes and curricular content is a generally accepted practice (1). It is particularly important whenever a change in the curriculum is considered or an innovative approach is implemented. This process of curricular evaluation enables informed decisions to be made concerning retention, modification or discontinuation of programs. Although ongoing evaluation is less critical in a relatively unchanging curriculum, it may be useful to ensure early detection of undesirable trends before they reach crisis proportions. The most commonly used instruments for curricular evaluation are questionnaire surveys of either students or faculty (2) and results of the students' performance (3). Both methods have serious shortcomings (2-5).

We report here more than a decade's experience at the University Center for Health Sciences and Services with a curricular evaluation tool that has proven itself in ongoing field testing and has much to recommend it. The system, referred to as debriefing, involves both students and faculty, and uses questionnaire surveys, face-to-face student/faculty interactions, immediacy of feedback, and timely application of conclusions for future courses.

THE METHOD

A standard debriefing session is held at the completion of each course and sometimes after a major segment in a given course, especially in the case of major, semestral courses. There are thus about 150 debriefing sessions each academic year.

The participants in the session usually comprise: 1) a course coordinator, other key teaching staff and representatives of the Curriculum Committee for that specific year; 2) student representatives, appointed by their classmates at the beginning of the course [these students have monitored the course, have distributed a questionnaire (Appendix) among their classmates and have discussed pertinent issues formally and/or informally with their classmates]; and 3) vice dean in charge of the curriculum, who is responsible for planning, coordination and implementation of the curriculum. When courses are in the process of change, or when new courses are evaluated for the first time, such sessions may also include coordinators of both courses that are prerequisites for the course being evaluated and of subsequent courses for which the evaluated course provides prerequisites. In the case of very short, minor courses, the debriefing sessions may be shorter, less formal, and involve fewer participants.

The debriefing session takes place within 2 weeks of completion of the course in order to preserve immediacy and a sense of relevance. The agenda for the meeting has been standardized and generally follows the sequence described below: 1) brief, overall impressions by the course coordinator; 2) brief, overall impressions by the students—based on the questionnaire survey and informal feedback from the students to their representatives; 3) detailed screening of the questionnaire, item by item, and discussion between faculty, students and course coordinator in an attempt to reach conclusions; and 4) recommendations and decisions for future implementation. The sessions generally last 1 to 2 hours, in an open and friendly atmosphere. Minutes of the session are published, distributed to the participants

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of the meeting, to other teachers of the course and to the Dean.

More than a thousand such sessions have been held during the course of the faculty's existence, and there is general agreement that in spite of the considerable amount of time demanded of both students and faculty, the results are worthwhile. The response rate of the students in filling out the questionnaire has continued to be gratifying (about 80%), and the teachers' willingness to participate in the debriefings has continued unabated. On the rare occasions when time schedules force any delay in scheduling debriefing sessions, the outcry from students and faculty attest to the importance attached to these sessions by both.

Although the basic principles and structure have remained unaltered, the curriculum at the school undergoes constant change. Almost all the changes have been either a direct or indirect result of the information and recommendations elicited by the debriefing sessions. The minutes also provide a longitudinal record of progress or regression in given courses over the years.

DISCUSSION

The system has a number of advantages. Firstly, it is ongoing and does not stem from difficulties or crisis situations. By having sessions after every single course and often after a segment of a course, "in-course" corrections can often be instituted immediately. This corrective action arrests possible damage from a poor or ineffective course, and minimizes student and faculty disaffection that might otherwise fester and be aggravated over a long period of time.

Secondly, the program evaluation does not rely solely on the written questionnaires, but supplements them by personal, informal data gathered by student representatives and by face-to-face contact with teachers, in the presence of the vice dean in charge of curriculum. This kind of personal contact provides deeper understanding of the precise nature of the problems, permits debate and discussion in order to avoid misunderstanding, and allows faculty members to respond to criticisms and present their point of view as well to the students. Nevertheless, the face-to-face meeting with the individual student does not reflect the personal views of randomly chosen students, but is based on quantitative information gathered from the entire class. Thus, the system combines the advantages of a class questionnaire with that of individual student presentation, while avoiding some of the pitfalls of each.

Thirdly, the face-to-face meetings also allow for faculty feedback to class representatives on student

performance and behavior, both cognitive and non-cognitive. This give and take is a healthy and constructive phenomenon that cannot be achieved by merely tabulating the results of a standard student questionnaire.

Fourthly, the students not only fill out a questionnaire but are drawn into the process as active participants. They are expected to gather information as well as to interpret it maturely and in a balanced manner, and to come forth with constructive suggestions. Since the class representatives are appointed specifically for evaluation of a particular course, most students have the opportunity to participate in the process quite often. This reduces the danger of alienation and leads to a feeling of meaningful student participation. Furthermore, the students gain understanding of the decision-making processes and learn to appreciate the professional and educational considerations governing the curriculum. They acquire critical skills for understanding institutional operation, and they gain insight into objective constraints, political obstacles and financial restrictions. As they progress from year to year, their suggestions become increasingly more feasible. Many of our young faculty members—graduates of our school—have benefited greatly from their earlier experiences as student representatives at debriefing sessions.

Finally, in addition to evaluation, the sessions are used for decision making, and operative decisions are often taken and implemented immediately. When an impasse is reached or when a problem has ramifications beyond the immediate course, the group decides to present the problem to the full Curriculum Committee or to the Executive Committee of the faculty. However, some operative decision is almost invariably reached, which is then brought back to students and faculty. The policy of implementing suggestions from debriefing sessions gives this system a distinct advantage over most program evaluation procedures in current use (1). Our system is thus judgmental rather than merely descriptive (6) and fulfills the "classic" requirements for evaluation methods, which aim to impart instruction (7).

In dealing with a face-to-face meeting, in which students evaluate teaching, the potential exists for serious misunderstandings and unpleasant confrontation. All participants must come to the meeting with a degree of openness, a measure of civility and an understanding of their own limitations and of the inherent limitations of the change process in a complicated and institutionalized system. The leader of the sessions plays a key role in directing criticism constructively, preventing tempers from flaring and egos from being badly bruised. Faculty

members learn that in the long run they benefit from constructive criticism and learn to appreciate it. The students develop a heightened sense of responsibility and social consciousness towards their classmates and teachers.

Because the danger of serious confrontation is ever present—and our experience shows that confrontational situations reduce teachers' responsiveness to student criticism—individual evaluations of specific teachers' performance have been removed from the debriefing sessions. Teacher performance is assessed on a continuous basis, using separate student questionnaires. These, however, are handed in individually, are not summarized or analyzed by the student representatives, and reflect individual, rather than group evaluation. This separation of teacher evaluation from course evaluation has been distinctly beneficial.

For the success of the system it is essential that both faculty and students feel that their suggestions are implemented and not merely filed in some drawer to gather dust. Yet one must resist the temptation of changing courses every semester in a hasty response to the passing whims of a particular class. A balance must be struck between responding to suggestions at debriefing sessions in order to preserve credibility and eternal fluctuation of a curricular content. This delicate balance requires mutual

trust, open-mindedness and tact from both students and faculty.

In summary, the debriefing session method of program evaluation meets the six requisites of Marshall (4) for a positive learning environment: it enables student interaction, preserves curricular goal orientation, ensures a flexible rather than authoritarian atmosphere, provides meaningful learning experiences as well as favorable emotional climate, and demonstrates nurturance and support by the institution.

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APPENDIX

Date: _____
 Course: _____
 Year: _____ Semester: _____

BEN-GURION UNIVERSITY
 CENTER FOR HEALTH SCIENCES AND SERVICES
 EVALUATION UNIT

STUDENT QUESTIONNAIRE

Please write next to each question the number that most closely represents your opinion. Use the following scale. Do not skip questions. If not applicable, write 0.

1 NOT AT ALL	2 LITTLE OR SOMETIMES	3 QUITE OR USUALLY	4 VERY MUCH OR ALMOST ALWAYS
-----------------	-----------------------------	--------------------------	------------------------------------

1. WAS THE COURSE INTERESTING?

Following is a list of factors. Which one(s) influenced your interest or disinterest in the course? (Circle all the major factors)

A. QUALITY OF INSTRUCTION

E. OPPORTUNITIES TO APPLY LEARNED MATERIAL

B. INTELLECTUAL STIMULATION

F. RELATION TO OTHER SIMULTANEOUSLY LEARNED

C. IMPORTANCE OF THE SUBJECT

COURSES

D. SCHOOL'S OBJECTIVES & ATTITUDES

G. RELATION TO PREVIOUSLY LEARNED COURSES

____ 2. HOW RELEVANT IS THE COURSE TO YOUR FUTURE MEDICAL CAREER?

____ 3. DID YOU HAVE A CLEAR UNDERSTANDING OF THE OBJECTIVES, STRUCTURE, EVALUATION METHOD AND WHAT WAS EXPECTED FROM YOU, AT THE BEGINNING OF THE COURSE?

____ 4. DID THE READING ASSIGNMENTS CORRESPOND TO THE INSTRUCTIONAL UNITS?

____ 5. WAS THERE ENOUGH TIME FOR LEARNING?

____ 6. WERE THE LECTURES BASED UPON PREVIOUS SELF-LEARNING AT HOME?

____ 7. DID THE COURSE FOLLOW THE HANDED-OUT INSTRUCTIONAL UNITS AND OTHER MATERIALS?

____ 8. INDICATE FAULTS IN THE HANDED-OUT INSTRUCTIONAL UNITS, IF ANY.

Use the following key:

A. INAPPROPRIATE GUIDING QUESTIONS

UNIT NAME

FAULT

B. TOO DIFFICULT

C. OUTDATED INFORMATION

D. REDUNDANT

E. IRRELEVANT TO LEARNED MATERIAL

F. UNCLEAR

9. WHAT WAS THE USEFULNESS OF EACH OF THE FOLLOWING?

____ A. LECTURES

____ D. LABORATORIES OR DEMONSTRATIONS

____ B. PRACTICAL EXERCISES

E. OTHER (please specify)

____ C. SMALL GROUP DISCUSSIONS

10. WHICH INSTRUCTIONAL METHODS ARE THE MOST APPROPRIATE FOR THIS COURSE?

(You may mention methods whether they have or have not actually been used.)

____ 11. WERE THERE ANY DISTURBING ORGANIZATIONAL PROBLEMS?

12. DID YOU FEEL ANY LACK OF KNOWLEDGE NECESSARY TO UNDERSTAND THE COURSE?

Please specify _____

13. WERE THERE REDUNDANCIES IN THE COURSE IN YOUR OPINION?

Please specify _____

14. FOR WHICH REASONS DID YOU LEARN? (Circle all the major factors.)
- | | |
|-------------------------------------|--|
| A. PERSONAL INTEREST IN THE SUBJECT | D. PREPARATION FOR EXAMINATION |
| B. RELEARNING UNCLEAR MATERIAL | E. SELF-EVALUATION |
| C. PREPARATION FOR A LECTURE | F. COMPLETION OF REQUIRED KNOWLEDGE NOT COVERED IN CLASS |
15. WHEN DID YOU SELF-LEARN?
___ BEFORE CLASSES ___ AFTER CLASSES ___ BEFORE EXAMS
16. FOR WHICH OF THE FOLLOWING REASONS DID YOU USE THE GUIDING QUESTIONS? (Circle reasons)
- | | |
|--------------------------------|----------------------------|
| A. PREPARATION FOR A LECTURE | D. PREPARATION FOR EXAMS |
| B. GOING OVER LECTURE MATERIAL | E. SELF-EVALUATION |
| C. CLARIFICATION | F. DID NOT USE THEM AT ALL |
- ___ 17. DID THE FINAL EXAM INCLUDE A REPRESENTATIVE SAMPLE OF THE LEARNED MATERIAL?
- ___ 18. WAS THE DIFFICULTY OF THE TEST ITEMS THE SAME AS OF THE GUIDING QUESTIONS & INSTRUCTIONS?
- ___ 19. WAS THE SELF-LEARNED MATERIAL, NOT COVERED IN CLASS, REPRESENTED ON THE EXAM?
- ___ 20. HOW WELL DID YOUR GRADE CORRESPOND TO YOUR SELF-ASSESSMENT?
21. WHAT ARE THE MAIN ADVANTAGES OF THE COURSE?
- | | |
|------------------------------------|---|
| ___ A. ACQUIRING KNOWLEDGE | ___ C. ACQUIRING PROBLEM-SOLVING SKILL |
| ___ B. APPLYING ACQUIRED KNOWLEDGE | ___ D. ENHANCING MOTIVATION AND CURIOSITY |
22. WHAT IS YOUR OVERALL ASSESSMENT OF THE COURSE? (check one)
SUPERB ___ VERY GOOD ___ GOOD ___ REASONABLE ___ POOR ___ VERY POOR ___
23. WHAT ARE YOUR SUGGESTIONS FOR IMPROVING THE COURSE?
- _____
- _____
- _____
- _____

A HISTORIC LOOK AT RESEARCH IN THE BEN-GURION UNIVERSITY CENTER FOR HEALTH SCIENCES AND SERVICES

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Isr J Med Sci 23: 992-994, 1988

Key words: Beer Sheva Experiment; medical education; research; basic sciences; publications

When the medical school was established in 1974, the main thrust went into setting up an educational framework geared to address certain basic problems in the delivery of health care in Israel. Thus, during these early days, a major effort was concentrated on organizational goals. Simultaneously, attention had to be given to urgent educational objectives such as the development of a goal-oriented admissions policy, the hiring and training of teaching personnel, and curriculum development. It is therefore not surprising that the three major goals that were conceptualized by the Founding Dean specified educational and service objectives, but did not elaborate on the need for the promotion of research (1).

Yet clearly the establishment of a quality medical school, with a broad teaching base in many medically oriented basic science aspects, required the establishment of an appropriate infrastructure for basic and clinical research. This attitude guided the Founding Dean who had extensive experience regarding the place of research in a medical school, when he hired people, provided space and allocated resources for the basic science infrastructure. At the same time, he took pains not to create white elephants in the form of large basic science departments that could easily become ivory towers, detached from the special needs of the medical school.

By 1974, the hospital had grown from its initial 300 beds in 1962 to a 650-bed hospital providing regional tertiary care. The hospital was equipped with laboratories in clinical chemistry, pathology, bacteriology, hematology and endocrinology. Since

the main objectives were the provision of medical service, little attention and meager resources were directed to research. Most of the physicians had not been trained in research procedures, and laboratory personnel were also geared by and large to provide service. This tradition began to change several years before the medical school was established, when some new heads of clinical departments who had a research background were recruited and were given space and equipment to do research. Thus, basic research began to appear even before 1974, mainly in the areas of nephrology, endocrinology, carbohydrate metabolism and hematology. But whereas the clinical manpower and patient material in the hospital were by and large sufficient for clinical teaching, the research and basic science infrastructure had to be developed almost from scratch. This development included the provision of space and the acquiring of university funds and grants for research. The recruitment policy included the hiring of investigators who were not able teachers, but were willing and able to contribute to service development each in his field—such as virology, immunology, endocrinology and metabolism. Recruitment of teachers for the basic sciences, epidemiology and sociology and the provision of proper conditions to conduct research had a major impact on the upsurge of research. This is reflected in a near logarithmic increase in the number of publications and the amount of research money generated, which in 1984 exceeded 1 million dollars. This policy did not only create research centers of excellence that have gained international reputation, but also diversified and upgraded the level of services provided to both hospital and outpatient clinic patients. In addition, an active visiting professor program was initiated

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whereby each year about a dozen internationally renowned scientists spend 4 to 6 weeks in Beer Sheva. This program has been most helpful, not only with respect to educational objectives, but also regarding the stimulation of research.

Additional steps were undertaken to strengthen the medical library by reorganization to include audiovisual aids, a computerized retrieval system and the addition of trained personnel. The library was moved to new attractive quarters and the needs of both students and faculty were met by the acquisition of 900 journals annually and approximately 2,000 books.

A research-oriented approach was also emphasized in the curriculum by a course on quantitative methods. In addition, students are given free time in their 5th year to be actively exposed to research for at least 1 month. They are expected either to plan a research proposal in detail, to perform research or to summarize and critically evaluate relevant literature. These research exposures are refereed by senior faculty and are a prerequisite for graduation.

A grant program was established to support students interested in research. The purpose of this program was to motivate students to collaborate personally with faculty in basic or clinical research. During 10 years, 88 students (20% of the student body) received such grants from the medical school. It is thus evident that in addition to the emphasis on holistic clinical care, varied opportunities for research orientation have been provided through different channels beyond that to which medical students are usually exposed in other medical schools. Several students have also interrupted their medical studies to obtain advanced degrees in basic sciences before resuming their medical training.

In order to provide the proper background for the teaching of scientifically based medicine, another group, whose research base needed strengthening was the young faculty. This was done in several ways. Firstly, the 6-month period of exposure to basic sciences, which is part of the requirements for specialization in this country, provided an opportunity to involve residents in research. This research, which in the past was performed mainly in extramural settings, became almost exclusively an intramural program. Young physicians were thereby exposed to research methodology and quantitative thinking, while they assisted the basic science units to increase and diversify the units' research activities. Secondly, many gifted clinicians were given an opportunity to obtain postgraduate training in the U.S. or other Western countries which included exposure to research. Thirdly, the medical school allocated, even during financial hardships, between

\$40,000 and \$50,000 annually to finance refereed research proposals of young faculty members. The intention was to stimulate research activity among junior faculty, often enabling the performance of pilot studies that could then serve as a basis for applications to external funding sources. This local "seed money" was spread rather thinly to activate a maximum number of people. Finally, last but not least, even if the "publish or perish" attitude does not prevail in our medical school, academic promotion does take into account, in addition to teaching and service, evidence of research activities in the form of refereed publications in scientific journals.

What was the impact of all these endeavors? What has been accomplished in the 10 years of the medical school and where do we stand today? In responding to these questions, I will limit myself to the following areas: 1) the impact of research on service and vice versa; 2) centers of excellence; 3) the scope of research in the medical school; and 4) future needs.

IMPACT OF RESEARCH ON SERVICE

There is ample evidence that the linking of research and service benefits both. It is apparently as important to expose the PhD to a clinical problem as it is helpful to expose the clinician to the way of thinking of the basic scientist. Today in our medical school, nearly each major clinical setting has its basic scientists who are also involved in service and teaching. This collaboration has resulted in clinically relevant basic research, be it in epidemiology, biochemistry, immunology or cancer research.

CENTERS OF EXCELLENCE

The faculty's administration supported the creation of several centers of excellence that have been of major importance in promoting research, generating funds and attracting scientists. Many of these centers have become internationally renowned, and some, in addition, have become involved in high technology, applied scientific activities. Moreover, interdisciplinary collaboration with investigators from other faculties of the Ben-Gurion University and with other Israeli universities was developed. University funding for travel abroad in the form of training grants and sabbaticals enabled members of our faculty to spend time in performing research and/or teaching in renowned universities and research centers abroad, thus promoting international collaboration between academic centers of excellence and our medical school. Many international medical and basic science symposia that were sponsored by our medical school and held in Beer Sheva proved to be a great success in attracting

renowned scientists and developing international relationships.

SCOPE OF RESEARCH IN THE MEDICAL SCHOOL

A trend towards community-oriented research is seen, as reflected in the relatively high percentage of papers dedicated to these subjects. The establishment of a strong unit of epidemiology, which in addition to performing its own extensive research and providing advisory planning and statistical services to many other projects in the medical school, was very helpful in planning and supporting various fields of research with special emphasis on community-oriented research.

FUTURE NEEDS

Several basic science fields lack a critical mass of investigators and depend on one or very few people. Most of these scientists have a major commitment to teaching, which further curbs their research opportunities. It is essential to increase their numbers, both to enable them to expand their research as well as from the teaching standpoint. Since Israel is going through a severe economic crisis, which is felt seriously in our University, a proposal to increase the number of faculty positions is impractical at this time. However, it is essential to strengthen these weak links in the chain, even on the basis of "soft" money. The fact that the medical school has recently received authorization to train graduate students for masters' and doctoral degrees will have an impact in increasing research potential.

We have a unique opportunity of being a central hospital with a large and stable patient community, excellent communication with the clinics in the field, and a Bedouin population that presents Third World problems, such as a high birthrate, relative malnutrition and a high prevalence of childhood infections. This population is in a unique position of

having access to modern medical services. This setting, which has had a remarkable effect on the infant mortality, has been studied to some extent by our epidemiologists, but could undoubtedly be investigated from other angles; such studies are expected to be of interest to international agencies such as WHO, AID, etc.

As an institution grows and becomes established it runs the danger of developing redundancies in both clinical services and research settings that are frequently created in order to solve personal problems. In the past, this has not been a major problem in our medical school; however, we should in the future try to avoid unnecessary duplications and rivalries that have had negative effects in other medical schools.

In the first decade, the medical school has made much progress in developing a basic science infrastructure to serve teaching and service needs, in addition to developing its own research interests. It has made its mark in research, not only in terms of quality and quantity, but also in its unique orientation. The policy was to develop certain units which would become centers of excellence. The strength of these units should be determined *inter alia* on the basis of their capability to generate international financial support. In addition to strengthening the weak links of basic sciences mentioned above, the medical school should in the second decade of its existence promote collaborative research both on an intra- and extramural level. Today, in the competitive field of research, one has to pool forces, come up with new ideas and work hard. If we will be able to do all of this, we can look towards the second decade of the medical school with confidence.

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THE VISITING FACULTY PROGRAM — A CORNERSTONE IN THE DEVELOPMENT OF THE UNIVERSITY CENTER FOR HEALTH SCIENCES AND SERVICES

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Key words: Beer Sheva Experiment; medical education; visiting faculty; models

HISTORICAL PERSPECTIVE

Our historical perspective on the Visiting Faculty Program (VFP) derives from memory since the archives are incomplete.

The year was 1971. Moshe Prywes, still in Jerusalem, had a vision of the Beer Sheva Experiment. He approached a distinguished American colleague, Dr. Sam Proger (Chairman of the Department of Medicine at Tufts University Medical School in Boston), about possible financial as well as moral support. Dr. Proger was an influential member of the Board of the Ziskind Foundation, a Boston-based family foundation. Moshe Prywes learned that the Ziskind Foundation was being phased out, and that the remaining \$50,000 under Dr. Proger's control would be awarded to the still-forming University Center for Health Sciences and Services at the Ben-Gurion University of the Negev in Beer Sheva (BGU). It was understood that the most important immediate use of the money was to support visiting faculty, i.e., experts from around the world; at the same time, final plans were being made to establish a permanent faculty. The Ziskind Visiting Faculty Program (VFP), most people thought, would be of a short duration, probably not lasting beyond 1975.

At a meeting of the International Congress on Medical Education in Copenhagen, Denmark, in 1972, Moshe Prywes approached Lord Max Rosenheim, President of the Royal College of Physicians, London, about serving as the leader of the VFP;

Lord Rosenheim agreed to assume the chairmanship. Perhaps the first visiting faculty member, he visited Beer Sheva that year and renewed his acquaintance with the town of Gaza where he had served as a medical officer in World War II. Unfortunately, Max Rosenheim never took up the task, as he passed away prematurely from a ruptured aortic aneurysm in the late fall of 1972.

Moshe Prywes had gotten to know me and knew of the very close personal bonds between Max and myself. Perhaps because of this, he asked me to lead the VFP, a task envisaged as a short-range commitment; thus a program began, whose life continues unexpectedly until this day.

In the 1970s Dr. Prywes was President of the University, and later he was appointed Dean of the newly formed University Center for Health Sciences and Services. Events in Israel seemed to indicate that the need for the VFP would extend longer than anticipated, and that efforts should be made to secure ongoing funding, especially since the program was deemed highly successful during its initial years. The dearth of faculty for the emerging medical school necessitated bringing teachers and administrators from outside of Israel to aid in planning, implementation of programs and handling of major teaching assignments:

We were able to convince Mr. Harry Dozor and his family of Philadelphia, PA and Palm Beach, FL of the merits of the VFP, and, since 1977 — through his continuing support — the program has grown in size and prestige while continuing to fulfill an urgent need in the medical school. A total of 78 distinguished medical educators from around the world

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have graciously given up their time (some of them repeatedly) since the beginning of the VFP, and several more have made commitments to participate within the next 2 years. (See Appendix for list of visiting professors.)

EVOLUTION OF THE PROGRAM — IMPETUS OF THE DOZOR VISION

Prywes' visionary Beer Sheva Experiment and Harry Dozor's ideals and continuing financial support have permitted stable planning of the Harry J. Dozor Visiting Faculty Program, which had heretofore been lacking. In the beginning, decisions about need and recruitment of faculty were made by the Dean and myself in my role as Chairman of the VFP. This leadership was replaced later by an appointed committee of the faculty who, together with the chairperson, were responsible for the management of the Program. All faculty were encouraged to submit the names of potential visiting faculty persons to the committee. Selection of visiting faculty was made, usually twice a year, and was dictated by educational and other priorities. Recruitment was largely the responsibility of the chairperson.

Other important decisions were made by the faculty committee. For example, the visiting faculty member was expected to devote a minimum of 4 weeks to BGU. At least 1 month was considered necessary, partly because of the expense of bringing persons to Israel. Also, the "culture shock" of participation as a medical school faculty member in a rather unusual environment (to many people) frequently required at least 1 week of adaptation. A second decision was that the visiting faculty's airfare should be paid from the Dozor Visiting Faculty fund, in addition to providing the member a modest *per diem* while in Israel. A third faculty committee decision was that spouses be invited, but at the visiting faculty member's expense. Fourth, the committee decided that a BGU faculty member be responsible for the visitor throughout his/her stay in Israel. Objectives of the visit, together with an implementation plan, were to be conveyed to the visiting faculty person. Finally, the committee decided that whenever possible, a conference should be arranged in Beer Sheva to focus on the visiting faculty member's area of expertise, and that invitations be sent to interested persons in the rest of Israel. The implementation of these decisions has been evolutionary and has become increasingly effective as the VFP has become institutionalized.

In the first years of the program, the visiting faculty member was requested to write a detailed report to both the Dean and the Chairperson of the

program on some aspect of the medical school's function. This proved to be a two-edged sword; on the one hand, it usually deepened the commitment of the visiting faculty person, but at the same time it set expectations by the visiting faculty member for the implementation of recommendations that were not always met. Currently, this reporting mechanism is requested only under certain highly specified circumstances, but all visiting professors are encouraged to discuss the medical school with Mr. Dozor and his family. An annual report is forwarded to Mr. Dozor by the Dean of the Center for Health Sciences.

CONTRIBUTIONS OF THE VFP TO THE FACULTY AND BGU

An analytic appraisal of the views of the visiting faculty members and the faculty at BGU suggests the following conclusions about the VFP:

- 1) The original objective of filling major gaps in local expertise and in curricular options has been largely achieved. As the number of faculty recruited to Beer Sheva has increased, the visiting faculty has supplemented and strengthened the contributions of the local faculty to the educational, research and service missions of the University Center for Health Sciences.
- 2) In many instances, the visiting faculty person has made important contributions to curricular planning and revision. The objectivity of the outsider has been a valuable addition to the ongoing evolution of the undergraduate curriculum, to the development and implementation of the graduate medical educational program, and to the critical review of research activities. In addition, assistance has been given to the Beer Sheva faculty in future research planning and development. In some instances, joint research activities have been developed to the benefit of both BGU and the visiting faculty person's home institution.
- 3) A substantial number of visiting faculty persons have made contributions to the planning of the systems that have to be implemented in order to more effectively merge the University's educational research and service missions with the service missions of the Ministry of Health and Kupat Holim (Health Insurance Institution of the General Federation of Labor).
- 4) Visiting faculty members have played an exceedingly important part as role models for the indigenous faculty as well as for the students in the health sciences (regardless of educational level).
- 5) The visibility of the Beer Sheva Experiment has been heightened greatly by the first-hand acquaint-

tance that visiting faculty persons usually achieve. The visiting faculty have in many instances become important and effective ambassadors for the University Center for Health Sciences.

6) The formal organization of the Overseas Faculty and their regular annual meetings have aided in the development of a broader base of commitment by influential non-Israelis to the faculty and to the University as a whole.

7) The VFP has permitted the development of a limited number of highly effective exchange programs at the undergraduate level, a model of which is the Albert Einstein College of Medicine/BGU. Other informal, but less institutionalized exchanges have taken place, particularly facilitating the development of more effective elective placement of Beer Sheva students in the UK, Canada and the USA.

8) The VFP has aided in the development of fellowship training opportunities for the best of the graduate medical educational trainees at BGU. This serves as an important contribution to the development of a future generation of faculty at the University Center of Health Sciences.

9) Faculty recruitment to Beer Sheva has never been an easy task. In some instances, committed visiting faculty persons have played a critical role in convincing a prospective faculty recruit to go to Israel, and on several occasions, the visiting faculty member has facilitated the generation of additional financial resources necessary for a successful recruitment process.

10) In some instances, visiting faculty persons, inspired by the Beer Sheva Experiment and imbued with missionary zeal, have aided the Associates' Organization in some countries to generate funds from outside Israel in support of BGU activities.

11) One of the obstacles in recruiting new faculty to this University has been the potential and sometimes very real isolation of the new person from his/her colleagues overseas. Visiting faculty have made real contributions in breaking down this isolation or preventing its occurrence.

12) In some instances, former visiting faculty have become important spokespersons for the University Center for Health Sciences and its individual faculty members. The value of an influential North American being able to vouch for a relatively unknown faculty member in the Negev desert is not to be underestimated.

13) The visiting faculty person has brought to Israel both Jews and non-Jews, many with only a limited knowledge of the constantly evolving new State of Israel. After their stay, substantial numbers have developed an unusual commitment to the country that extends far beyond the Negev.

SOME FAILURES OF THE PROGRAM

Some of the leaders of the VFP had envisioned the development of several parallel activities that have not yet come to effective fruition. These activities include the establishment of a vital and effective Overseas Faculty Organization. The Organization was to consist of all past visiting professors and be governed by a board of directors or executive committee whose members would rotate. It was hoped that this organization would be able to aid the Dean and the University President in carrying out specific tasks. Perhaps the most important reasons for the failure in the Overseas Faculty Organization were the absence of a stable secretariat, the Dean's failure to designate explicitly stated tasks (rather than general notions described at the annual board meeting), and overseas faculty's failure to spend adequate time to complete requested tasks.

Another failure of the program is that overseas faculty from the larger urban areas in the United States have not effectively fostered local chapters in support of the Center for Health Sciences' activities. The main reason for this appears to be the unwillingness of Associates' organizations to provide staff support to the visiting faculty member. In my view, Associate support is crucial; the faculty member's own university or academic medical center staff cannot be depended upon for this purpose.

It had also been hoped, particularly by Dr. Prywes during his tenure as Dean, that overseas faculty would facilitate the development of an Association of Physicians (Friends of the Center for Health Sciences and Services) and would, for a relatively modest investment, make annual contributions to a capital fund. The problem in implementation of this laudatory objective has been the Associates' organizations' understandable competition in their fundraising for other purposes.

THE FUTURE — IS THE MODEL REPLICABLE?

Futurism is an inexact science (or perhaps it is an art) and can also be misleading and even dangerous. However, some statements about the future can clearly be made accurately. The need for the VFP persists and will continue to do so for a foreseeable period. Fortunately, the investment in the program, although substantial, has been modest in terms of the benefits gained from it. We can expect that pledged contributions will become more critical with each passing month. Also, we can anticipate that the recruitment of faculty in the Western world will become increasingly difficult because of decreased financing of health sciences education, research and service programs in the USA, Canada and the UK.

The ease with which distinguished faculty members from these countries can leave their usual positions for a month is also diminishing, and many must sacrifice their vacations to do so. In many instances, faculty members' absence from their parent departments or schools is at a substantial financial sacrifice to the department or institution. Faculty members not involved in the program do not take lightly to this kind of commitment. Philanthropic funding is never secure, yet if asked what the sums of money invested in the VFP might buy of equivalent importance, one arrives at the conclusion that the same financial commitment to a more restricted purpose or to the general funds of the University would never achieve a result of equal worth to the VFP.

If one were to ask whether this model program is replicable elsewhere, I would have to answer affirmatively. Although the circumstances that fostered the creation of the VFP had unique features, the

forces that led to its implementation can be found or developed elsewhere. Other institutions may well build on this experience in launching new programs of this type.

I thank Mrs. Noga Porter and Mr. David Singer for their help in identifying archival materials that were essential for the preparation of this manuscript.

I also wish to pay tribute to the memory of Lord Max Rosenheim, former President of the Royal College of Physicians, London who accepted Dr. M. Prywes' invitation to chair the Visiting Faculty Program at its inception.

The author wishes to pay personal tribute to Harry and Shirley Dozor and to their three children for the ongoing support of what can be documented as an unqualified success.

The seminal role of the late Dr. Proger of Boston in acquiring the initial funds for this program is also gratefully acknowledged.

APPENDIX

A VISITING FACULTY AND YEAR OF VISIT, 1975-87

*John Beck, MD, Chairman 1975-87**Charles Hollenberg, MD, Chairman 1987-*

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Joel Alpert, MD Professor of Pediatrics Boston University Boston, MA, USA	1979	Avram Cooperman, MD Professor of Clinical Surgery Columbia University New York, NY, USA	1980
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CENTER FOR MEDICAL EDUCATION

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The Standing Committee of the Senate of the Ben-Gurion University of the Negev (BGU) established the Center for Medical Education in January 1982, with Dr. Moshe Prywes, founding Dean of the Ben-Gurion University Faculty of Health Sciences, as its chairman. The Center operates with five full-time staff members—an educational psychologist, a research assistant, an administrative assistant and a secretary. Faculty members from the clinical, basic sciences and behavioral sciences disciplines are affiliated with and participate in the various research activities of the Center. The Association of Deans of Medical Schools in Israel has proclaimed the Center as the National Center for Medical Education for all four medical schools in Israel.

The Center's activities were aimed at two main goals that were essential to further develop the Beer Sheva innovative approach to medical education. The first goal was to evaluate the Beer Sheva Experiment, which was introduced in 1974 by the establishment of the BGU Center for Health Sciences and Services, to assess its impact on the profile of the BGU medical school graduates and to investigate the interaction of the educational and health delivery systems within the University Center for Health Sciences and Services in the Negev. The second was to establish an academic medical education center for students and young physicians who wish to pursue an interest or a career in medical education, and thus prepare future young leaders who may carry the Beer Sheva spirit to their own local medical systems. Such important goals were likely to be achieved only in an academically oriented center

that is continuously updated with the latest developments in medical education in Israel and abroad. Consequently, the following objectives provided the framework for the Center's academic activities:

1. To initiate, support, encourage and implement scientific studies of methods, techniques, philosophy and planning of medical education.
2. To encourage communication and exchange of ideas, research information and findings among teachers and researchers of medicine and those from other faculties (education, social sciences, technology, etc.) in order to promote and expand the scope of medical education.
3. To plan and organize symposia, national and international conferences, and meetings on medical education.
4. To encourage faculty, researchers and educationalists from all medical schools in Israel to become members of the Center, by participating and initiating collaborative activities and comparative studies in the field of medical education.
5. To host and welcome researchers affiliated to other medical institutions in Israel and abroad.
6. To encourage both physicians and students to become actively involved in issues related to medical education.
7. To provide guidance for medical students who wish to pursue their MD theses in the field of medical education.

Since the establishment of the Center, a comprehensive, follow-up, comparative study of BGU graduates has been operating on an ongoing basis (see "The Ben-Gurion University graduate profile: an evaluation study" in this issue). The Center is also preparing a complete student data base of all 13 cohorts, which will provide a comprehensive profile of a Beer Sheva student and graduate and will de-

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scribe in depth the characteristics of the school's student population.

Twenty-three students and young physicians were selected from all four medical schools in Israel to serve as Fellows of the Center. The Fellows are chosen on the basis of recommendations from their Deans. The criteria for selection are meant to identify individuals who indicate leadership characteristics through outstanding activities. Most of the Fellows are in close touch with the Center. Some receive academic consultation for special projects, others ask for either administrative assistance or sponsorship of innovative ideas as well as professional advice and support. The main idea is to establish an informal dynamic group of concerned, young and able potential leaders who interact with each other through issues of medical education. These encounters serve also as a medium of vivid interchange of experience and ideas between students of different schools. Informal meetings and periodical retreats with the Fellows' families add an atmosphere of one big family to this special group. The Fellows are involved in some extra professional activities above and beyond the professional routine work. They choose their own fields of interest and activities and report on their work in a very informal way at the Fellows' quarterly gatherings. Each Fellow is granted a modest scholarship to support his/her professional development—a onetime allocation of \$1000. They are permitted to spend their scholarship money in any way they may wish; no receipts are requested. The range of interest of the Fellows varies from medical education, the medical arts to innovations in medical teaching. With time it has become prestigious to become a Fellow of the Center. Whenever the Center becomes interested in a national survey in medical education, the Fellows serve voluntarily as delegates of the Center in their respective medical schools or hospitals. In addition, about 50 clinical and basic sciences faculty from all medical schools in Israel are members of the Center and are invited to special meetings and discussions organized by the Center. Many are senior teachers with established authority in their field. Others are young faculty members who look for more training in medical education. Many are physicians, nurses,

health workers; others are educationists. They all find in the Center a national encounter forum.

Research studies carried out by the Center touch many facets of medical education, including: cognitive development of medical students, clinical problem solving, evaluation of educational programs, student evaluation, curriculum development, interaction of medical education and medical care. In addition, the Center provides consultation for various faculty committee members regarding evaluation of research issues. Recently the Center was asked by the headquarters of Kupat Holim in Tel Aviv to take the responsibility for activating a national program—Faculty Development in Family Medicine in Israel.

The Center has hosted several outstanding international scholars who have served as visiting professors in medical education, as well as foreign students who spent some time in the Center working on various projects.

The authors have established professional ties with other centers abroad, mainly through informal meetings in medical education conferences. The organization and planning of the annual conference of the Association of Medical Education in Europe (AMEE) and the Association of Medical Deans in Europe (AMDE), which took place in Jerusalem in September 1985, was one of the highlights of the Center's work. The conference, whose theme was "Tradition and Change in Medical Education," was attended by 150 participants from 20 European countries.

During the 5 years of its existence, the Center for Medical Education has proved to be another unique feature of the Beer Sheva medical school. As the Center is supported financially by private endowment funds and allocations from private donors, its activities are kept independent of the University's budget. While situated in the medical school, it has succeeded in remaining an independent, yet integrated component of the school. This independence permits objectivity of evaluation, while the integrated position enables the Center to monitor the pulse of the school's dynamic development and observe the forces for both stability and changes.

BIOCHEMISTRY AND MORE

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Key words: Beer Sheva Experiment; medical education; biochemistry; self-learning; cognitive and applicative skills

Many preclinical medical students tend to view basic biochemistry as a subject that does not play an important role in medicine (1). In Beer Sheva, however, the basic biochemistry course for first and second year medical students is uniquely popular. For 10 consecutive years, students have exhibited willingness to study biochemistry intensively, and their overall rating of this course has been particularly high. Professional evaluations by visiting biochemists reinforce this high rating. For example, in his report of February 1980, Dr. Isadore S. Edelman (Professor of Biochemistry and Chairman, Department of Biochemistry, College of Physicians and Surgeons at Columbia University, NY), stated:

The organization of the biochemistry course is novel, with considerable emphasis on self-learning and problem solving; both commendable goals of course. I was especially impressed by the close, even personal, relationships between the students and faculty. Thus, the overall quality of the teaching program in biochemistry is high and in some respects superior to those with which I am familiar in the U.S.

Since the curriculum of biochemistry, including the topics studied and the major textbooks used, is common and similar in most medical schools, it is clear that other factors must be responsible for the success of the course in Beer Sheva. Several possibilities should be considered: objectives, course

design and implementation, staff, student activities and evaluation.

OBJECTIVES

The main objectives for the basic course in biochemistry are: 1) to enable students to acquire information in biochemistry when they require it, through familiarity with the language and major concepts (cognitive phase); 2) to enable students to apply the acquired biochemical information to unfamiliar conditions or situations (applicative aspect); 3) to enable students to use their cognitive and applicative skills to solve problems (problem-solving stage); and 4) to enable students to read original scientific literature and to present a paper both effectively and critically.

These statements are similar but not identical to the objectives formulated by Mehler (2), who contributed much to our model.

COURSE DESIGN

How can such objectives be implemented? The central theme of the course is a combination of two components—appealing content and demanding structure.

Modern medicine requires a grasp of knowledge of immense proportions. There is no chance to introduce it all during the several years of study and of course not in a given course. This limitation leads us to use a curriculum that is essentially universal, with the emphasis on interesting and relevant aspects. We were careful not to convert the course into clinical biochemistry, but where applicable, the study material was “flavored” with clinical examples. For example, protein synthesis was

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introduced on the background of a specific case, namely β -thalassemia, yet the biochemical aspects of protein synthesis were not compromised.

An important feature of the biochemistry course is a framework that formulates explicit demands concerning assignments for self-learning, for group discussion and for presentation within a given timetable. The trend in many modern programs is to stimulate self-learning by recommendation of selected topics, reading materials, etc. To cope with modern biochemistry, we have chosen the good old educational approach of assignments and timetables.

Unit of instruction

The basic component of the course is the unit of instruction. The entire course comprises two semesters (the second semester of the first year, and the first semester of the second year), totaling 32 weeks. The curriculum is divided into 20 main topics (units), as outlined in Table 1. Every unit lists the subtopics, the pages that should be read thoroughly [from texts, mostly Lehninger (3) and Montgomery et al. (4)], and an original paper. Sets of approximately 20 questions are prepared for every unit, some from the literature and some original. The questions are organized on three stated levels:

Table 1. Curriculum of biochemistry course

Topic	Hours	Original paper	Frontal lecture
Nutrition	6	+	+
Amino acids and peptides	4	—	—
Proteins—covalent structure	6	+	—
Proteins—configuration and conformation	6	+	+
Enzymes a	6	—	—
Enzymes b	6	+	—
Introduction to metabolism	4	—	+
Nucleotides—structure and metabolism	6	+	+
Nucleic acids—structure	4	+	—
Nucleic acids—metabolism	4	+	—
Carbohydrate structure and glycolysis	8	+	+
The citric acid cycle	4	+	—
Oxidative phosphorylation	5	+	+
Gluconeogenesis and pentose phosphate pathway	6	+	—
Glycogen metabolism	4	+	+
Lipid metabolism	6	—	—
Lipoprotein metabolism	4	+	+
Sphingolipids, gangliosides and mucopolysaccharides	2	—	+
Amino acid metabolism	4	—	—
Integration of metabolism	4	—	—

1) cognitive, relating directly to the reading assignment, 2) applicative, and 3) problem solving. The inclusion of the applicative aspects and the need to solve problems demonstrate to students that the subject matter is indeed relevant to biochemical and clinical practices.

The requirement that the students submit written assignments regularly (almost weekly) for review has resulted in two beneficial effects: 1) the students are generally well-versed in the topic and are thus prepared for the discussion in the study group, and 2) they receive personal feedback pertaining to their ability to cope with challenging questions, as their assignments are returned promptly with comments. The original paper included in many of the units does not merely provide an opportunity to study an interesting scientific paper, but serves an educational purpose as well, namely to practice critical in-depth reading. The student's comprehension of the central points of the paper and the extent of his/her critical powers soon become evident by means of the written assignment and the weekly discussions in the study groups.

Class activities

These consist almost entirely of small group discussions (12 to 15 students per group), with an occasional lecture to the entire class for the purpose of summing up a topic or the introduction of an important concept. The groups and their teachers (usually senior faculty) meet twice a week for 2 hours, while students devote an additional 12 to 16 hours on their own.

For obvious reasons, the small study group is quite a burden on the teaching staff, especially at the senior level. Nevertheless, we insisted upon this format and regard it as a crucial element in the successful implementation of the course. Was this insistence justified? The virtues of studying in small groups are well recognized. In a small group, the individual student has the opportunity to participate actively; he can test his ideas in a less formal context, question concepts and statements that he does not fully comprehend, and obtain important feedback from the experienced teacher about his grasp of the subject. The small group provides an opportunity for the teacher to discover whether the students, both as a group and as individuals, understand the subject. Moreover, the teacher can ascertain the difficulties of individual students and encourage them to learn in the manner best suited to their own needs. In the context of the small group, students can learn from one another by discussion. They can present varied points of view on a problem and can learn through an interchange of ideas. We have

noticed that during the course the students gradually learned to listen to their colleagues. In conclusion, we have found, like so many before us, that teaching in small groups is a powerful educational medium that provides the conditions under which students can study and understand a subject for themselves.

Evaluation

Assessment of students' achievements is based on written tests. The students study in three groups, with a different teacher assigned to each group for the entire semester or for the major part of it. By comparing the grades of the students in these groups, we had the opportunity to evaluate whether the achievement of an individual relates to the teacher. Grades obtained in four consecutive semesters, during the courses of seven different teachers, were compared. The teachers varied greatly in their teaching and research experience, ranging from 2 to 12 years post-PhD, yet the average grades in the three groups were similar, with insignificant differences. We conclude that the students' efforts and activities, rather than the background of the teachers, played the major role in their achievement.

Student seminars

While self-learning and motivation to study are valuable attributes, how can we mold these behavior patterns into a structured course? One of the most effective means is the presentation of a case report-type seminar. During the course, every student presents a topic to his fellow students, teachers and guests, related to the material studied. Generally speaking, the 1-hour presentation is derived from a genuine case, which is presented briefly (about 5 minutes), mainly in order to introduce biochemical questions and to explain its principal features. A condensed review of the biochemical background follows, but the main challenge for the speaker is to lead an active discussion dealing with alternative explanations and different views of a given problem. The seminar is summed up by referring back to the case mentioned initially. These presentations contain a wealth of educational benefits, especially for the student who prepares and presents the seminar. Even practical aspects, such as learning how to prepare slides, are constructive fringe benefits. But most important is the experience of presenting a given subject in a lucid and logical manner, as well as accommodating it within a given time span and scope.

Laboratory sessions

The laboratory aspect of the curriculum has

undergone considerable changes. Originally, six 4-hour sessions were scheduled, but in practice only three or four took place. These dealt with proteins, enzyme activity, glycolysis and glycogen metabolism. Eventually, after several years, one of these sessions was replaced by the exposure to an active research program in a laboratory of one of the staff members. The laboratory sessions were never intended to develop the students' practical and analytical skills in biochemistry, but rather to promote self-learning and to facilitate the grasp of abstract and diffuse biochemical tools. We have noticed that when the need arises for an approach to solving a problem, students will frequently describe a procedure such as X-ray diffraction which, albeit valid and sound, is absolutely unrealistic in terms of cost, instrumentation, time etc. We believe that the laboratory sessions help rectify this somewhat naive approach.

PROBLEMS

The design of the course is not free of problems, and they should be pointed out. The course is demanding and attractive and has reached dimensions that naturally take time from other activities. Due to the magnitude of the course, its design is not readily applicable to other subjects, particularly those offered concurrently. The implementation of the course imposes a heavy teaching load on the staff. The teachers meet weekly for several hours prior to every unit in order to coordinate the activities of the three parallel groups, as well as to discuss the correct answers to the questions given to the students.

An intriguing question relates to the students' knowledge of biochemistry several years after taking the course. During the course the students are highly motivated, eager to do well, and indeed appear to fulfill the specific objectives. The level of knowledge and comprehension of biochemistry of most of the students by the end of the course and when evaluated during the same year is impressive. However, several years later, by the end of their studies towards the degree of MD, there is no proof that our students' knowledge of biochemistry is on a higher level than that in other schools.

CONCLUSION

This paper describes the objectives, design and operation of a course, featuring a particular emphasis on self-learning and organizational aspects. A structured system with specific demands on the one hand and claims of self-learning on the other may sound contradictory, but in effect these two factors have proved to be complementary. Medical students are obviously quite busy and tend

to devote their time primarily to the demands made on them. Whether it is the continuous feedback they receive during group discussions, inspiration from the teachers or the interesting material studied—whatever the stimulatory factor(s), the fact remains that for over 10 years now our medical students have uniformly indicated that they have worked hard, enjoyed the course and studied willingly and eagerly. Judging by the students' attitudes and the skills they have acquired, it is not merely biochemistry they have learned. Indeed, it is biochemistry and more.

We thank our fellow teachers for their contributions in the planning and teaching of the course: David Chipman, Yossi Granot (Graziani) and Reuben Chayoth, from the

Biology Department, as well as Shraga Shany, Joseph Levy, Ilana Nathan, Sergio Lamprecht, Ruth Shaikin-Kestenbaum and Yoav Sharoni from the University Center for Health Sciences and Services. Finally, we wish to thank Asher Segall for his insight and inspiration in designing the unit of instruction.

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"The brief history at the beginning gives the reader some sense of the excitement of founding a new school in a country which itself is only thirty-four years old. It is evident from the description that the school was founded to meet carefully identified health-care needs in a particular area of the country. It is made quite clear that this school responded to changing health needs of the society which it was to serve. Thus, it is important to note that those changing health needs are what became the basis for the institutional learning objectives for the new school."

EPIDEMIOLOGY TEACHING: PROSPECTS AND PROBLEMS

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Key words: Beer Sheva Experiment; medical education; epidemiology teaching; health care services; biostatistics

There is no longer any dispute about the close relationship between epidemiology and medicine. The contribution of epidemiology to the understanding of etiology and prevention of diseases, as well as to their natural history, is widely recognized (1). In addition, epidemiology provides the tools for the evaluation of diagnostic procedures and therapeutic strategies. Despite these well-accepted attributes, epidemiology is still taught as an elective course in most medical schools, usually at the end of the medical curriculum. This paper addresses the approaches and problems related to teaching epidemiology at the University Center for Health Sciences and Services of the Ben-Gurion University of the Negev.

EPIDEMIOLOGY COURSES

One of the main objectives in the creation of the Ben-Gurion University medical school was to integrate service, teaching and research in a way that would benefit the Negev and eventually other areas; epidemiology teaching, therefore, was aimed at providing medical students with the knowledge and skills that would facilitate the practice of community-oriented medicine.

To reach this objective, it was decided that the areas in the epidemiology curriculum deserving particular emphasis should be: 1) the critical approach to collecting and analyzing data, 2) community diagnosis, and 3) the natural history of disease. Table 1 displays the epidemiology courses taught throughout the 6 years in our medical school.

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The teaching of epidemiology is intensive during the first 2 years, where the foundations of this discipline, together with biostatistics and their practical applications during the field projects, are particularly emphasized. During the clinical days of those years, this knowledge is applied to the natural history of cardiovascular diseases (1st year) and breast cancer (2nd year).

The epidemiology field project at the beginning of the 2nd year deserves special comment. It was designed with the objective of applying this knowledge and the skills acquired during the 1st year to subjects relevant to the population's health. Examples of subjects that have been addressed are: child injuries at school, the prevalence of high blood pressure in development towns, home mortality after stroke, and birth weight and maternal smoking. This exposure to planning, data collection and analysis, and inference making has a powerful effect on the student's understanding of the various selection processes involved in the health care system that may affect the natural history of disease.

In the 3rd year, epidemiology is built into the teaching of the various body systems. The objective is to describe different models of the natural history of disease which may be used for the better understanding of chronic conditions. Models selected include coronary heart disease, hypertension, chronic respiratory disease, diabetes and colorectal cancer. During lectures and seminars, the preventive aspects of disease as well as those of diagnosis and prognosis are emphasized. Time is provided for discussion of the benefits and drawbacks associated with early diagnosis and the methods for evaluating the impact of interventions.

During the 4th year, teaching of epidemiology

Table 1. *Epidemiology courses at the Ben-Gurion University Center for Health Sciences and Services*

Year	Course	Content	Method
1st (two semesters)	Epidemiology and Quantitative Thinking	1) Epidemiology: investigations of epidemics, screening, natural history of disease, study design 2) Biostatistics: distributions, graphic display of data, sampling, estimation, hypothesis testing 3) Natural history of cardiovascular disease	Discussion, using coronary heart disease as a model; interview of patients Lectures, class exercises and small group discussions Lectures
2nd (3 weeks)	Epidemiology Field Project	1) Planning, executing, analyzing and reporting on a subject. Short SPSS course included 2) Natural history of breast cancer	Groups of 6 to 7 students with instructor. Data presented to the whole class for discussion plus written report
3rd	Epidemiology of Various Body Systems	Natural history of: 1) Cardiovascular disease 2) Gastrointestinal disease (Colorectal cancer, hepatitis) 3) Respiratory disease (chronic pulmonary disease) 4) Endocrinology (diabetes) Evaluation of therapy	Seminar and case presentations
4th	Clinical Epidemiology	1) Testing diagnostic procedures 2) Application of epidemiology to medical practice	Seminars and clinical rounds
6th	Epidemiology Project in Primary Care	Planning, executing and reporting on a subject related to primary care	Collection of data during primary care clerkship

uses two complementary methods. The first is represented by seminars with exercises on testing diagnostic procedures, as part of a preparatory course on clinical decision making given before the students begin their clinical clerkships. The second method, which is still in a developmental stage, consists of clinical practice. This approach attempts to facilitate the integration of the courses learned during the first years into clinical practice. It is felt that at this point of the medical curriculum, epidemiology teaching would have the greatest impact on the students' future behavior as physicians. Ideally, the instructors should be clinicians with a strong epidemiological background, who would emphasize those epidemiological issues that have key implications for the care of patients during the clinical clerkships (2). This ideal situation can be attained only by training our residents in epidemiology. As the medical school curriculum and the epidemiology courses were developing, it became clear that a gap existed between our medical students and clinical instruc-

tors concerning issues of epidemiological concepts and skills. That was explained by the clear differences in curriculum between the medical schools where our residents were trained and that of our students. Many of the residents had not had epidemiology courses at all. Postgraduate courses in epidemiology (which will be discussed later) may provide a solution to this problem.

During the last year of medical school, students complete their clinical clerkship, including that of primary care. During the latter, students are required to define a problem relevant to primary care practice in the community and to analyze it in a systematic way. Instructors from the Epidemiology Unit serve as consultants for this purpose. This project is similar to that in the 2nd year, yet is specifically different in that it is carried out on an individual basis and is generally clinically oriented.

In addition to the epidemiology courses at the medical school, there is a curriculum in epidemiology at the School of Nursing and Physiotherapy, as

well as seminars for graduate students in the *Health Economics and Administration* program. These courses are also complemented by field projects performed in groups of five to six students.

POSTGRADUATE EDUCATION

Epidemiology courses are at a very early stage of implementation for residents. Two departments, Family Practice and Obstetrics and Gynecology, have requested our teaching as part of their residency programs.

In addition, there are alternative methods of both formal and informal training in our medical school. An example of the former is the 6-month rotation in basic sciences required by the Israel Medical Scientific Council for completing speciality boards. Until 1980, only two residents in our hospital chose a rotation in epidemiology. Since then, seven more have completed this rotation and an additional four are presently working in our Unit, including two residents from internal medicine, five from pediatrics, one from surgery, two from ophthalmology and one from obstetrics and gynecology. The growing interest in epidemiology shown by clinicians reflects, at least in part, the recognition of the uses of this discipline in medical practice and in the planning, performance and analysis of research work. Undoubtedly, the medical literature has been a fundamental factor in facilitating this recognition.

During the rotation in epidemiology, residents are required to plan, execute, analyze and report on a survey or clinical trial relevant to their area of specialization. They also have parallel tutorial training in the Unit, which is intended to expose them to relevant issues in epidemiology and statistics. The residents' tutors are also responsible for advising them about their research projects. Some of the

residents' research projects have been published (3) or presented at scientific meetings.

Informal training is represented by the daily contact between students, physicians and other health providers and the Unit's staff. Since the Unit is located in the hospital, there is easy access to it. Consultation services on research issues as well as collaboration in clinical research are widely developed. These contacts are very useful in arousing interest among clinicians about the role of epidemiology in medical practice.

EVALUATION

Student and staff evaluation of the courses has played a very important role in planning changes in the epidemiology curriculum. Although there are year-to-year fluctuations in the students' rating of the courses, the rating for the first year's course has always been very high; most students recognize the need and importance of the epidemiology and biostatistics teaching. It is worth noting that ranking of the importance of epidemiology by students grows with increasing seniority of the students and reaches a peak among the graduates. This undoubtedly reflects both a successful integration of epidemiology within the framework of the medical curriculum and the recognition of this discipline as an essential part of medical education.

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EARLY CLINICAL PROGRAM FOR NOVICE MEDICAL STUDENTS: 13 YEARS' EXPERIENCE AT BEN-GURION UNIVERSITY OF THE NEGEV

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Medical education has been increasingly challenged during the last decade. The major faults ascribed to it have been a lack of responsiveness to changing health needs (1, 2), overemphasis of biomedical models while ignoring the psychosocial aspects of health and disease (3), and concentration on acute care within the walls of the specialized hospital while neglecting primary care (1, 2, 4). Medical education was criticized even more for producing graduates who are oriented toward disease rather than health, and toward cure rather than care, resulting in profession orientation rather than patient orientation (5).

These critical voices were followed by a plethora of calls for curricular changes. Advancing contact with patients to an earlier stage in the education was one of the more frequent suggestions. Early clinical exposure was expected to remedy some of the "diseases of the curriculum," as Dr. S. Abrahamson called them (6), by redirecting the students' attention to the care of patients in their families and communities, utilizing personal and societal resources.

The calls for curricular reform also highlighted faults in the teaching-learning process in medical education, which early clinical exposure might cure. Houts and Hench (7) called for a curriculum in which clinical material would precede conceptual material in order to achieve relevance. Nadelson et al. (8) suggested early clinical exposure in which current reality would be examined against the back-

ground of previous knowledge and experience and would thus shape future expectations. McGaghie et al. (9) argued that early clinical exposure would converge learned elements into a meaningful conceptual construct. Many others stressed the advantages of earlier patient contact for strengthening interpersonal competencies of graduates.

These suggestions for curricular change were congruent with learning theories and models, which were recently created, studied and confirmed outside medical education. Among these are student-centered education, suggested by Rogers (10); the concept of the advanced organizer as a vehicle for integration and conceptualization of learned material, suggested by Ausubel (11); the confluent education theory of Brown et al. (12), calling upon merging cognitive and affective processes in order to promote learning; interdisciplinary integration proposed *inter alia* by Taylor et al. (13) and Schwab (14, 15); and the Brunerian learning by discovery in a spiral progression from lower to higher levels of sophistication (16).

The combination of a strong need for changing the traditional curriculum with the appropriate theoretical grounds should have created a revolution in medical education. This, however, did not occur. Some attempts to advance student-patient encounters have been described by a number of authors. Yet, the majority of those encounters are quite brief, limited to short, unrepeated exposures (17-19). More successful are early clinical programs, which aim to transmit a limited number of specific clinical skills, such as emergency care (20, 21), physical diagnosis (22), and especially communication skills (22-25).

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Most of this clinical teaching takes place within the campus walls—in classrooms or in some “clinical skills laboratory”—with a limited, if any, exposure to the real world. Very few curricular innovations that advance clinical studies to the earliest possible phases of medical education were indeed comprehensive and continuous, involving the student in real clinical life within the community (26-28). Unfortunately, many of these attempts were discontinued, and not necessarily because of educational failure. Nevertheless, several early and comprehensive clinical programs do exist, but they are elective programs, directed toward a self-selected group of students (29, 30). Thus, contrary to expectations, clinical studies in the earliest phases of medical education, defined as both continuous and encompassing exposure to patients, communities, societal institutions and health care services, are extremely rare.

This article describes a required early clinical curriculum that is both comprehensive and continuous. This curriculum has been successfully implemented in the Ben-Gurion University Center for Health Sciences and Services (UCHSS) for the past 13 years. The program is analyzed in terms of its general goals, instructional objectives, specific advantages, educational by-products, and some difficulties and problems. The program has previously been described elsewhere (2, 31, 32). In spite of some evolution over the years, the basic structure and educational approaches have not changed.

Recognition should be given to the American Joint Distribution Committee whose extensive and long-standing financial support has enabled the UCHSS to introduce changes in the primary health clinics adapting them for teaching purposes.

EARLY CLINICAL PROGRAM

In a 6-year curriculum, the duration of the early clinical program (ECP) at UCHSS is 3 years. The program begins in the very 1st week of school, although the students have not been through any premedical program and possess only high school qualifications. The program ends when the students start their rotating clerkships.

Four concepts, or “didactic axes,” guide the ECP: 1) the life cycle axis, “from cradle to grave”; 2) the axis of the natural history of a disease, from screening populations under risk and identifying health problems through ambulatory maintenance, to the acute hospitalization phase and back to the family and the community via the rehabilitation process; 3) the health axis, from normal growth, development and functioning to the pathological processes; and finally, 4) the responsibility axis, from being a recip-

ient of knowledge and learner of skills, to service obligations with a growing level of responsibility. These four lines are highly interwoven, yet distinct.

The learning-teaching methods differ in the 1st, 2nd and 3rd years, so it is thus more convenient to describe the ECP of each year separately.

First year

The ECP in the 1st year includes 1 day/week throughout the academic year (the “clinical day”), and three additional 1-week “miniclerkships” toward the end of the year.

In the clinical day the students rotate in small groups through five programs. In each program they are further divided into subgroups of three to five students. These subgroups rotate within each program, between “stations” in which they serve for 1 day.

The first program is growth and development. The stations here are Maternal and Child Health clinics, kindergartens in both affluent and underprivileged neighborhoods, as well as elementary and junior high schools. In these stations, the students learn to assess normal growth and development by interviewing children of various ages, and their mothers, teachers and counselors. They also observe children in different settings and perform the appropriate physical and psychological measurements. One additional day is spent in the pediatric ward of the hospital and concerns the impact of a child's chronic disease upon the family. The teachers, instructors and preceptors at all the stations are pediatricians, nurses, social workers and psychologists, working either individually or in teams.

The second program is prenatal care. The stations include community prenatal care clinics, family planning centers, a course preparing young couples for childbirth, as well as many home calls. Again, the rotation of small subgroups enables the acquisition of skills for both assessing and counselling, including simple components of physical examination and laboratory tests. The obstetrics program continues in the miniclerkship later in the year.

The third program takes place in the internal medicine wards of the hospital and is devoted to detecting the impact of hospitalization on the individual and his or her family. The students try to ascertain—from the point of view of the patient, the family and the physicians—the direct cause of the disruption of the ambulatory maintenance. They have to delineate a rehabilitation and follow-up program for the patient. The students also acquire basic nursing skills and further develop their proficiency in simple diagnostic procedures.

The fourth program is devoted to vocational rehabilitation of discharged patients through reassignment in their previous or new place of work. Students learn to assess the physical status and fitness of adults, as well as the factors influencing fitness. Again, physical examination and the operation of equipment (ECG, spirometry) are further developed.

The fifth program is geriatrics. The stations include the geriatric department, the municipal home for the aged, community clubs for senior citizens, the geriatric social services and again, home visits. In this program students acquire knowledge of the aging process and the ability to assess the physical, mental, social and functional status of the elderly. They also further develop their nursing skills. The teachers include physicians and various allied professionals.

Concurrent with the five rotations are three longitudinal subprograms. The first, and the most emphasized, is in communication skills. The students interview healthy and ill individuals, families and professionals. In each station they conduct about one interview on every second clinical day in the presence of their peers, the preceptor and sometimes a behavioral scientist, and observe additional interviews by peers. The interviews, relating to both process and content, are carefully scrutinized by the group and the instructors. A written summary of the interview is submitted and corrected. In addition, each student is videotaped twice during the year, and the recording is analyzed privately with a social scientist. At the beginning of the year the interviewees are selected, and must be cooperative and Hebrew speaking. Later in the year, the students encounter less cooperative interviewees, as well as talkative, silent, anxious and crying patients.

A second longitudinal subprogram is aimed at sharpening the observational skills of the learners. Students report on their observations of patients and learn to differentiate between findings and interpretations, objectivity and subjectivity. Small groups meet with hospitalized patients 10 times during the year and report to those in the class who have not seen the patients, yet must be able to perceive the reported observations. The lack of "medical" knowledge at this stage enables the students to be unbiased by diagnoses and free of mind-sets.

In the third longitudinal subprogram, students acquire first aid skills. This is the first phase of this multiphasic emergency medicine curriculum, described elsewhere in this volume.

The three 1-week miniclerkships at the end of the year include primary care, hospitalization and obstetric programs. In the first, the students serve a

week with a family practitioner in one of three different health care systems in various parts of the country. Among these is a closed, protected kibbutz community in which the nurse practitioner runs a wide range of health services. The other two are differently integrated hospital-community systems. The second miniclerkship is in the hospital. Two random patients are assigned to each student, who follows them closely for a week from their admission to the emergency ward until their discharge. One day during this week is devoted to optional self-hospitalization, and a detailed analysis of the impact of hospitalization upon various aspects of the patients' life is made. Finally, the obstetric miniclerkship includes participation in two deliveries, careful follow-up of mothers and newborns, and two home visits, before and after the discharge of the mother and baby from the hospital.

Wherever the students are stationed along their rotations, they apply knowledge and skills acquired in the science courses simultaneously learned in the classroom, especially biochemistry, physiology, epidemiology, biostatistics and behavioral sciences. Simple diagnostic procedures such as blood counts, spirometry, urine analysis, ECG recording and first aid measures are either learned in the laboratory setting and applied in the clinical rotation, or vice versa. Epidemiology and biostatistics help in generalizing patient problems.

The ability to integrate other disciplines and to apply scientific knowledge to clinical cases is reinforced by the *Clinical Confrontation* course. In this course, students discuss in small groups a written simulated patient problem, identify issues for further explorations, reconvene for exchange of learned material, and gradually progress towards solving the problem. During the process additional information is provided, simulating changes in the patient's status, laboratory findings and the like. Four 2-hour sessions are devoted to each of the three problems, and each is summarized by a panel of specialists involved in the case. The problems selected for the 1st year are childhood asthma, Down's syndrome and an outbreak of gastroenteritis (33).

Second year

The 2nd-year ECP also consists of various components, the main one comprising six 1-week miniclerkships during the year in primary care, mental health, nutrition, arteriosclerosis, infectious diseases and cancer. Other components are physical examinations, clinical confrontations and a public health field project.

The primary care miniclerkship is identical to that

in the 1st year, and provides each student with the opportunity to serve in another offered setting of the three. However, in contrast to the 1st year, the students systematically examine their patients, applying the new skills that are acquired through the physical examination component of the 2nd-year program. This includes 10 half-day sessions, also incorporating surface anatomy. The physical examination program evolves directly from the 1st-year observational skills course, attempting at this stage to achieve a systematic and thorough approach to examination, although not yet to attempt differential diagnosis.

The mental health miniclerkship deals specifically with simple reactive neuroses of the kind frequently met by family practitioners. Students further develop their communications skills, acquire psychiatric interviewing techniques, and become familiar with the scope and range of mental health services.

In the nutrition miniclerkship, small groups of students in various clinical settings learn how to assess nutritional status, what people eat, and to what extent patients comply with prescribed diets. Ethnic, cultural and sociological factors are considered, and biochemical knowledge is applied.

The fourth miniclerkship stresses the concept of natural history of a disease, using the model of arteriosclerotic diseases. The students rotate in small groups through outpatient clinics for hypertension, diabetes and peripheral vascular disease; they then move to internal medicine, coronary intensive care and vascular surgery departments, and finally visit cardiac rehabilitation clinics.

In the infectious diseases miniclerkship, the stations are pediatric wards, neighborhood clinics and preventive medicine laboratories and institutions. In each station, the students interview acutely ill patients, obtain the proper specimens for further investigation and prescribe, under supervision, the proper treatment. Knowledge and skills acquired in the science courses in pathology, microbiology, virology, pharmacology and epidemiology are applied. The efficiency of the treatment is assessed by reexamining the same patients at the same sites toward the end of the week.

The 6th and last miniclerkship is devoted to cancer. Each student is assigned two patients, preferably one who knows his or her diagnosis and one who does not. The stations include surgical and medical wards, early detection clinics and oncological institutes. Students also meet with volunteer patients who have been cured of cancer and who are tutoring presently ill individuals. These tutors convey to the learners their perceptions, expectations and feelings at the time of their illness. A major

emphasis in this week is placed on the issue of death and dying.

Toward each of the last three miniclerkships, the students are engaged in intensive problem-based self-learning activity. Written simulated case reports for which each student learns one discipline in depth, enable fruitful and lively group discussions. In addition, interdisciplinary seminars on the week's themes are held every evening of the miniclerkships. These may include selection of antibiotics, epidemiology of infections, carcinogenesis, basics of nutrition, etc. Knowledge gained from all basic science courses, from molecular biology to pathology, as well as from psychology to medical ethics, is applied in an integrated manner.

The 2nd-year ECP also includes the completion of a public health field project by small groups. This project is based on the 1st-year courses in epidemiology, biostatistics and research design, as well as on students' clinical experiences. Sometimes the students select the subject from a list, or it may be a class project comparing, for example, several aspects of two communities, or, more frequently, the problems are identified by the students themselves through their clinical experiences in the community. The student groups gradually develop a detailed design and protocol during two weekly sessions with a tutor, followed by data collection in the field. Later the data are organized and analyzed, and the study is then presented to peers and faculty for feedback. The hundred or so projects completed so far include, for example, a comparative screening of growth and development of children in various communities, prevalence of hypertension in two communities and its behavioral correlates, screening of kindergarten children for amblyopia, incidence of home accidents among children in various populations, the whereabouts of patients referred to hospital but not admitted, suicide among adolescents, and anxiety among hospitalized and nonhospitalized cardiac patients.

The 2nd-year ECP also includes two 1-day service periods in a mobile intensive care unit as a continuation of the 1st-year emergency care course. Finally, the *Clinical Confrontation* course continues. The three patient problems dealt with in the 2nd-year are gout, immune deficiency and diabetes mellitus. Tutored as in the 1st year, each case is analyzed by small groups in four sessions and summarized by interdisciplinary teams.

Third year

Third year ECP covers the themes of emergency care, the family and health education. Issues of emergency care are incorporated into the classroom studies of each of the integrated body systems. This

theoretical knowledge is exercised in a 1-week advanced life-support miniclerkship, which studies the cardiovascular, respiratory and nephrological systems. Several refresher sessions in first aid and basic life-support skills precede the miniclerkship. Monthly supervised evening shifts in surgical, medical and pediatric emergency wards and in coronary, respiratory and pediatric intensive care units follow the miniclerkship.

The family program consists of a follow-up of a family in which one member is chronically ill. Biweekly meetings with the family are supplemented by meetings with the family physician who is the preceptor, and with social workers, psychologists and psychiatrists, teachers and superintendents, nurses and welfare workers and others, as appropriate. The family dynamics and the impact of the disease on everyday life are stressed. Communication skills are further developed to include the art of both interviewing a group and terminating longitudinal relationships.

The third track of health education is optional, yet it attracts some 80% of the students. Each student is assigned to two groups with whom he or she meets weekly throughout the year to discuss health issues. The groups are usually junior high school classes but may also be young mothers meeting in a community club, inmates in the local prison, illiterate adults in their elementary education courses, etc. The issues dealt with at the meetings range from general and dental hygiene to sex education, and from normal body function to tobacco, alcohol, and drug abuse. In parallel, the students are engaged in additional self-education. Weekly sessions deal with didactics of presentation as well as content-oriented sessions on various health issues. The program was initiated by the students, who also run and evaluate it with help from faculty.

Finally, the 3rd-year ECP also includes simulated patient problems within the framework of the clinical confrontations—such as cardiovascular, respiratory, nephrological and endocrinological problems in various combinations—and are designed to provide an opportunity to integrate knowledge across systems and across disciplines. As in the previous stages, each problem is summarized by a panel discussion.

DISCUSSION

A complex, varied yet integrative ECP has been presented. There is no doubt that the program meets the requirements stated earlier; namely, it is comprehensive, continuous and exposes the students to a diversity of individuals and communities in a variety of settings and situations. Nevertheless, a few questions should be addressed: What exactly does this

program achieve? Is it really essential? Are there perhaps simpler and cheaper ways to achieve the same results? And further, is this ECP reproducible? Can it be adapted to other institutions operating under different conditions?

I believe that the ECP plays a major and irreplaceable role in the professional growth of medical students, and that the graduates who have passed through the program will be different from those who have not. Further, the program can be adapted to many institutions.

The first advantage of ECP is the enhancement of student motivation to learn. The freshman students come to the profession to care for people and to cure them. They did not intend to be engaged in tedious learning of chemistry, physics and mathematics, nor of biochemistry, histology and genetics. It is not the cadaver on the dissection table of whom they dreamed as their first patient. However, they accept the importance of basic sciences if and when the relevance to care and cure is both shown and felt. It should be noted that relevance is not an intrinsic quality of an external event. Rather, it is a psychological construct which points to a congruence between learner's and teacher's perceptions of the educational experience (34). ECP provides the opportunity to demonstrate how basic sciences fit into real-life medicine, providing the basis for clinical solutions. The effect on learning motivation is considerable and is well known to both students and educators who have experienced ECP.

However, the effect of ECP on the professional socialization of medical students reaches far beyond the issue of motivation. The students' initial desire to care and cure (1, 35), sometimes called "healer's drive" (3), is traditionally channeled into the scientific approach from the start of their studies and through an extensive period of the crucial, formative years. This scientific approach is perceived by the novice learner as a call for unequivocal answers to the questions of causality, to be discovered by tedious, objective, unemotional and painstaking efforts (36). Ambiguity is tolerated as an unfortunate transitory phase until learning is completed or until science further progresses to provide "the truth." Affect is totally deplored (36). The fact that this is a false perception of science is irrelevant. The students do not stay long enough in the scientific milieu to outgrow this perception, which thus becomes a factor in their professional growth.

Clinical reality is very different and is perceived so even by the novice. It is willing to accept ambiguity and to operate under uncertainty; it does not require reductionalism and allows multivariant causative matrices, or may even ignore causality altogether.

but it never deplores affectionate relationships. Thus, the students who are exposed to ECP develop different attitudes towards both science and clinical medicine and to their mutual relationships. These students may also later be spared the painful conflict that often arises during the transition from preclinical to clinical phases. This conflict is resolved all too frequently by cynicism and a further departure from the initial drive to care for people, into what is often mistakenly named "scientific medicine" (1, 3, 6, 35, 37).

The application of newly acquired knowledge to clinical situations within the framework of ECP enables the learners to construct a comprehensive conceptual frame by integrating across disciplines, both biomedical and psychosocial. This is very different from presentation of integrated material by proper sequencing of the curriculum, because it is the learner rather than the planner who is integrating. The program thus becomes an "advanced organizer" (11) through active search for and discovery of solutions to real problems (16, 38). Integration, active learning and discovery are not ends in themselves. Nevertheless, they have been shown to improve recollection, to promote understanding and to trigger high-level cognitive processes of problem solving. Education in which ECP is a central feature thus becomes a process in which questions are generated and answers are sought, rather than the conventional process of providing answers to questions not yet asked.

Less crucial, yet worth mentioning, is the issue of the joy of learning. Patient contacts, interdisciplinary approach to human problems and active problem solving turn the learning into fun and the course of studies into an enjoyable period rather than an unfortunate but unavoidable preparation for life. The effect of the joy of learning on the outcome of this learning in medical education has yet to be evaluated.

Could the same goals be achieved by a problem-solving, problem-based approach, using written simulations in the classrooms and simulated or even real patients in the "clinical skill laboratory"? Some authors support this position, pointing to favorable results in several innovative institutions (22, 39). Without going into a detailed discussion, I agree that some educational advantages may be achieved equally by problem-based learning (40). However, only real life, in which real people are looking for real solutions to real problems, can trigger such an extent of personal involvement by the learner and elicit maximal commitment. Only real life provides such a variety of situations in which there are no right or wrong answers and in which solutions must

be reached in spite of incomplete or even conflicting data. No simulation can compete with reality in entangling organic, socioeconomic, psychological, societal and environmental factors, bringing them all into a matrix where they should be equally considered in a "truly multidisciplinary context" (41). In other words, although simulations may affect the cognitive processes as ECP does, they have a lesser effect on the socialization process because they lack the experiential dimension. It is the "confluent education" (12), in which cognitive and affective processes are interwoven, which brings about the change in personal growth (10). In fact, some authors recommend that clinical experience precede cognitive content learning in order to achieve the desired educational effect (7, 42).

Acquiring communication skills, which attracted much attention in recent years (43), is an appropriate illustration. The period in which the students know little about symptoms and signs, syndromes and diseases, but empathize with people, is the best time to internalize habits of obtaining information needed so badly for a good interview, yet so often overlooked: Who is the person in front of you? What are her/his background, beliefs and values? How does this person perceive his/her own condition? How does this condition affect her/his life? What are his/her expectations, fears and hopes? What are her/his resources? Nevertheless, students in ECP do relate to and learn of medical problems. It is the proportion between the narrow "medical" and the wider health status that makes the difference.

Similarly, learning observational skills at this early period demands that the students be able to detect details without being distracted by diagnoses. What kind of paleness is there? Is it whitish, blueish, yellowish or gray, rather than is it anemia, cor pulmonale, jaundice or uremia. Moreover, the students are expected to learn to differentiate between objective observation and personal interpretations, and to convey both in a way that enables the reader to differentiate between the two.

Somewhat similar approaches to teaching communication skills are seen in several programs elsewhere (24, 25, 43). Some were conducted within the framework of psychiatric departments, some by primary care departments and others by nonphysician experts; all have been reported to yield favorable results. However, it is possible that an isolated program will not have transferability to other disciplines and settings and to future years. It is suggested that the efficiency of the UCHSS communication skills learning (44) is related to the fact that doctor-patient communication is taught in all the components of the ECP, relating to real patients in the

presence of physicians, usually the patients' doctors. No transfer is required, only habit formation, which is easier in the earliest phases of education.

So far, ECP has been discussed in general terms, regardless of the actual content of the program, provided that it exposes the freshman students to a variety of situations in a real-life context. However, the content may be so directed that additional, more specific institutional goals may be achieved. UCHSS is committed to community health. The ECP described above enables the student to become intimately familiar with a variety of communities, which differ from each other by ethnicity, socioeconomic variables, age distribution, occupation and geography. Learners serve in both formal and informal societal institutions, meet with professionals who are involved in maintaining health in its broadest sense and visit homes and families. The students become aware of the impact of a disease on every facet of life, and of the available personal and societal resources to cope with the ailment. The learning is gradual, with ever-growing levels of independent activity and responsibility.

ECP is partly organized around the well-known model of the natural history of a disease, often taught in medical schools but seldom experienced by students. ECP provides the students with the opportunity to participate in primary and secondary preventive activities, including health education; to take part in ambulatory care of chronically ill patients; to witness the acute and sometimes heroic life-saving care in the hospital; and to be active in designing and executing rehabilitations plans. The modern, glamorous hospital is thus perceived as but one short phase along a long axis. It is necessary, yet sometimes implies a failure of proper care, which always aims at keeping the patients in their families, community and work. Even the graduates who will later select hospital careers will have regard for what has happened to their patients before hospitalization, what will happen subsequently, and what the patients feel and think about it. This proven long-standing effect demonstrated by UCHSS graduates (44, 45) may perhaps be attributed to the ECP.

UCHSS students are raised to be change agents. The institutional commitment to improve health care services requires a critical approach to the existing frames and models. ECP provides the elements needed for such a challenge: the personal experiences in a variety of health care delivery systems; sensitivity for health needs as these are perceived and expressed by patients rather than by the medical establishment; awareness of resources; capability to work in broad, interdisciplinary teams; and finally, proficiency in assessment of needs, achieved through

the public health projects and supplemented by information on health care planning. Most important, however, is the exposure of students to all these at the beginning of the socialization process and before a hospital-centered mind-set is created. Later, these students do not accept the existing services as an unchangeable factor.

The educational activities in ECP follow the life cycle, which encompasses developmental processes and their interplay with emotional, mental and social dimensions of life. The students "discover" the multiplicity of elements that affect a child's growth; they learn to perceive and appreciate the difference between middle-aged women with and without dependent children at home, and they acquire a new insight into the issue of institutionalization of the elderly. Most important, they accept these differences as part of the clinical reality rather than irrelevant information imposed by behavioral scientists.

Three dimensions have been mentioned above: the natural history of a disease, the life cycle and the available personal and societal resources for coping. Internalization of these by the learners in an early phase of their education enables them to consider simultaneously all three dimensions, realizing that diseases present themselves differently, progress differently and lead to different outcomes in each of the small cubicles created by the three-dimensional model (Fig. 1). Each cubicle thus requires specific management. As with the Rubik cube, students must spin the individual cubicles in order to achieve a comprehensive solution.

Some difficulties in implementing ECP should be addressed. The first is the need of central coordination for integrating the disciplinary components into a meaningful interdisciplinary sequence. Coordination is also needed because of the logistic complexity of the program. Departmental chairpersons may have difficulties in accepting such central control, not realizing that their autonomy to select contents, to appoint teachers and to convey concepts is not threatened. On the contrary, the various clinical disciplines gain additional curricular time in an earlier phase, while sharing the educational experiences with other disciplines. Similarly, basic scientists who are required to give up some curricular time in order to make room for ECP cannot always realize that the learning of sciences may be greatly enhanced rather than cut back. These two difficulties require strong institutional leadership and a deep belief in ECP.

A more objective difficulty is the need for so many teaching sites and clinical preceptors simultaneously. UCHSS has the advantage of controlling regional health services, as the Dean is also the

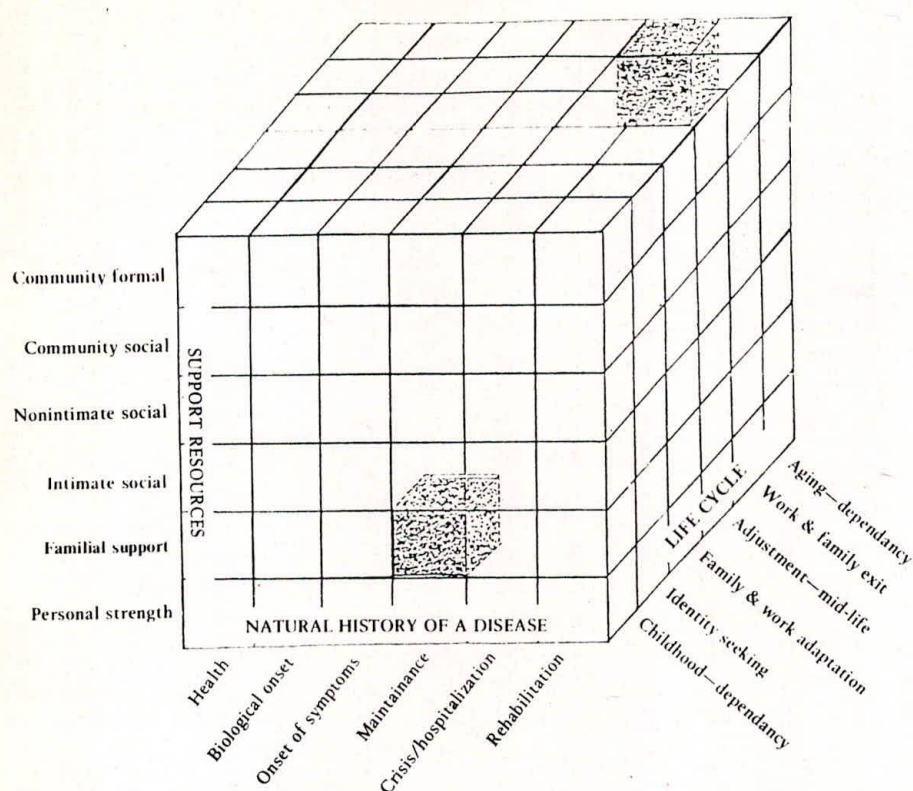


Fig. 1. The disease cube—A community-oriented approach to a disease entity.

regional director of the health care-providing organizations (46). However, many institutions have mutual relationships, both formal and informal, with the health care delivery authorities. These may be used for organizing ECP. It is suggested that the willingness of nonacademic physicians in the community to teach is greatly underestimated, and the assumption that teaching interferes with practice is greatly exaggerated. Further, ECP may utilize a multiplicity of health professionals other than physicians.

Teaching by nurses, social workers, school teachers, psychologists and many other community workers enables not only economy in academic manpower, but more important, the teaching of broader concepts of health. These allied professionals are often capable teachers, who are often even more willing to participate in teacher-training activities than are academic physicians. Further, since the actual content of ECP is of secondary importance, institutions may take advantage of whatever facilities and professionals are available, instead of looking for a particular kind of teaching site, not within reach. It is thus suggested that initiating of ECP is an attitudinal issue more than it is an administrative, political, financial or educational one.

It is often argued by traditionalist medical educators that there is no proof of the advantage of this or that innovation (as if the traditional approach

requires no proofs). UCHSS is suggesting an innovation that makes a difference. Will medical educators accept the challenge?

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THE FLUCTUATING FORTUNES OF THE BEHAVIORAL SCIENCES

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In 1936, Dr. Henry E. Sigerist, some years after leaving Leipzig to join the Johns Hopkins faculty, addressing a conference of medical students (1), said:

I anticipate your question, "What shall we do?" My answer is: study. Study history, political economy, sociology! I know that your time is limited and that the medical curriculum is exceedingly absorbing. And yet, if you want to live and to act consciously and intelligently, you have to have some knowledge in the social sciences. And finally you cannot afford to be disinterested in sociology. The physician is serving society. He has to fit himself into a given structure of society. He has to see patients who come from all strata of society and has to treat diseases that are quite often due to an environmental influence... if we have troubles today, they are due to a certain extent to the fact that our medical ancestors of the last century directed all their efforts to laboratory work, neglecting the social side of medicine.

Almost 40 years later, medical education throughout the Western world still largely disregarded Sigerist's oft-repeated statement that medicine was also a social science. Lip service was paid here and there. But the 1965 Royal Commission on Medical Education (2) still saw as revolutionary its belief that sociology as well as psychology were disciplines as essential to medicine as were the biological sciences.

It was essential, the Commission argued (para 108), that the medical student be aware:

why patients and families behave as they do in situations of illness; of the social and cultural factors which influence the patients' expectations and responses; of the problems for doctor, patient and family in management of illness and handicap in the community; of the social, ethnic, occupational and psychological forces which can hinder prevention and treatment; and of the difficulties of communication and other problems which arise from established expectations about the way a person in a defined situation will behave, particularly in hospital.

But such knowledge was only essential if a far-reaching assumption, involving a fundamental conception of medicine, was made. Jefferys (3) put the issue most directly:

If the doctor of the future is seen simply as one who is concerned exclusively with the physiochemical properties of man and his organs, then all he may be required to learn while a medical student is enough to enable him to display skills and sensitivity in his relationships with patients and other health professionals. [However] if the doctor of the future is to take a wider responsibility for the range of human problems which can undermine social functioning and a sense of well-being, then his need to be well grounded in the behavioral sciences is paramount.

One point should be clear at the outset. The two conceptions do not differ at all with respect to the centrality of humane values—decency, honesty, empathy, responsibility and so on—in the practice of medicine. No proponent of the broader conception can legitimately claim that the behavioral

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scientist can teach students to behave decently. If anyone can "teach" such behavior, it is the clinician who is adopted as a role model by the student. Having said this, however, it should be noted that what the behavioral scientist can teach in this respect is an understanding of the psychological, social and cultural conditions that promote or impede such physician behavior. But the true expertise of the behavioral scientist is indeed in understanding the range of human problems noted by Sigerist and Jefferys.

As is amply clear in the introductory papers to this volume, one might even say that the core of the Beer Sheva Experiment was a commitment to the broader conception of medicine. With respect to the behavioral sciences, this was expressed institutionally in a number of ways. One of the first units to be established in the school was the Department of the Sociology of Health. Its small staff, consisting of two medical sociologists, a medical anthropologist and a political scientist, was to be enhanced by involving other faculty members, particularly clinical psychologists and social workers, as well as clinicians, in its teaching responsibilities. The faculty bylaws provided for a representative of the behavioral sciences in the two major policy-making bodies, the Executive Council and the Curriculum Committee. From the very outset, behavioral scientists participated in most of the committees planning one or another part of the curriculum. The hours devoted to the behavioral sciences were never a source of contention. There was a consensus that time allocation was to be determined by the significance of what was to be learned. Above all, the very powerful Dean and the Associate Dean for curriculum, as well as the key professors attracted to the school, were on our side. Finally, and not coincidentally, the fact that the first chairman of the Student Admissions Committee, who was the first representative of the school met by new students, was a sociologist conveyed the message that his was an important discipline.

The Beer Sheva Experiment at the outset, then, seemed to provide promising opportunities for the successful integration of the behavioral sciences into the curriculum. Let us now turn to what was done, what happened, and where things stand at present, finally returning to the lessons to be learned.

THE CONCEPTUAL APPROACH

If the behavioral sciences constitute an independent field that merits an autonomous place in the structure and curriculum of a medical school*, and not as

*This autonomy, as that of all other fields, is qualified in Beer Sheva, given the fundamental principle of vertical and horizontal integration of the entire curriculum.

an appendage to psychiatry, epidemiology or community medicine, how is it to be fitted in? Traditional medical schools have difficulty in answering this question because their thinking is molded in terms of a tripartite division of the curriculum into basic sciences, medical science and clinical studies. The behavioral sciences, relevant to all three parts of medical training, cannot be fitted into this mold. The Beer Sheva curriculum, based on the principles of the spiral, is a much more hospitable framework. Operationally, it follows that its teaching must be conducted throughout the 6-year curriculum and fitted in an appropriate manner into whatever else is included each year.

Second, although the behavioral sciences have loosely meant psychology, social psychology, sociology and anthropology, each a different discipline with its own concerns, traditions and questions, our assumption was that it would be a mistake to engage in disciplinary teaching to medical students. Instead, we started out by seeking to specify "What are the problems with which the graduate physicians of Beer Sheva will be confronted?" We would then address ourselves to teaching skills, attitudes and knowledge of our disciplines relevant to coping with these problems. The assumption was that, in the Beer Sheva curriculum, there is almost always a behavioral sciences "angle" to what is being studied. This does not mean that organizationally the behavioral sciences must always be part of another program. It does not mean that the relevance should always be clear.

But clear to whom? We made the assumption—unwarrantedly, as will be seen later—that what we, the behavioral sciences, saw as relevant to the Beer Sheva graduate practicing physician would also be seen by our students and by our medical colleagues as relevant.

Finally, we thought it crucial to have students learn the key concepts with which we work and the kinds of questions we ask, rather than the facts and findings of empirical studies. While the data do suggest that a widower is in a high-risk category in the first half year, it is far more important for the student to learn that developmental transitions always pose health problems.

THE EARLY YEARS

Had we had a long lead time, we might well have worked out a total curriculum. As all who were with us in the heady early years recall, we seldom were more than a step ahead of the students. In 1974, we planned for 1974-75, and most of our energies went into carrying out the plans. In 1975, we planned the second year of studies, carrying a 2-year teaching load. By 1977-78, we had a 3-year teaching curriculum.

The first component of this curriculum was self-evident—the first-year program in *Communication*. This flowed from the fundamental decision of the school that clinical work was to be introduced at the very outset of studies. There were many clinical skills and areas of knowledge a first-year student could learn, but at the very core, we all agreed, was talking to the patient (or, rather, as we stressed, listening to a person). The course was coordinated by behavioral scientists, but psychologists, social workers and clinicians were all involved in the teaching conducted in small groups. Over the years, there have been various modifications of this program, but its essentials have remained the same.

A crucial problem may be noted. Few physicians have even been trained in communication. They record a history skillfully, germane to the particular presenting problem, but have neither the skill, the conceptual approach, nor the time to listen to the person adequately, to establish a relationship that would enable them to acquire rounded understanding. Our goal was to have the Beer Sheva student learn to conduct an interview the way a family physician—in the first encounter with the patient—ideally should. On the other hand the behavioral scientist, in the eyes of the student, is not a real doctor, even though he is skilled in communication. Sometimes this led to conflict; more often, the busy clinician was glad to leave the teaching to the behavioral scientist. Over the years, a few physicians have become skilled. In other cases, a physician and behavioral scientist formed a team, complementing each other, each learning from the other. Despite the problem, this is one of the areas of success in the curriculum. Reinforced by continued interviewing in the 2nd and 3rd years, the Beer Sheva student, entering his 4th-year clerkships, is far ahead of his peers elsewhere.

Parallel to the life-cycle approach adopted in the first-year clinical program, our first behavioral science didactic course was the *Normal Life Cycle*. Carrying on throughout the year, class lectures traced the emotional, social and cognitive developmental lifelines, largely following an Eriksonian model. In each session, there was some attempt to locate developmental challenges in the context of culture. In a few sessions, physicians were brought in to speak of the physiological lifeline as it interacted with the other lifelines.

Though not taking a major active role in teaching, behavioral scientists were represented in the committees planning the 1st-year clinical program (over and above communication) and ecology projects.

Beer Sheva's 2nd year has traditionally been the most disciplinary. In keeping, the behavioral science

input in the first years consisted of two didactic courses. The first, called *Society, Culture and Health*, aimed at equipping the student with basic concepts in social anthropology. The examples given, the problems posed and the exam questions were all health and medicine oriented, whether the topic was culture, ethnicity, family or social stratification. It was, nonetheless, a course that required a leap of the imagination. The second course was primarily an introduction to basic principles of psychology: intrapsychic processes, learning, perception and cognition. Both of these were semester-long courses.

The overall 3rd-year program is based on organ systems. No attempt was made to link the behavioral sciences in any way to this program, though epidemiology was occasionally represented. On the other hand, the 3rd-year clinical program was the primary responsibility of the behavioral sciences: the Family Program. In this project, each student, starting from an index person with a chronic illness, maintained ongoing contact with a family for a period of 4 to 5 months. The goal, beyond deepening the communication skills of the student, was to create an understanding of the family as etiologic agent, as copier, and as the bearer of the impact of illness. Each team of students was tutored by a behavioral scientist-physician pair.

THE INTERIM PHASE

By the end of the 4th year (1977-78), a reassessment was due. Clinicians responsible for the 4th- to 6th-year clerkships had not exactly come knocking at our door for help. Our resources in any case were stretched. (It should be noted that as scientists in an academic department, we conducted a respectable research program, over and above our teaching responsibilities). The communication program was going reasonably well. The family program was more complicated. Going out into the community, into homes, and developing an ongoing relationship with a family was immensely anxiety provoking. "What right do we have," many students asked, "to probe deeply when we are in no position to really help?" For some students, the program boomeranged. Others somehow glided through, learning little but not becoming too upset. For still others, it was a moving and maturing experience. Modifications were subsequently introduced, but in principle the program remained throughout the decade.

The didactic programs in the first 2 years, in contrast, were problematic from the outset. Attendance (not compulsory in Beer Sheva except for clinical or lab studies) declined, often to less than half the class. Few students read even the required reading. There were no qualifying disciplinary exams, and one

could easily pass the integrative exam without the behavioral sciences. The complexities, "soft" data and competing theories of the behavioral sciences, in contrast to the seeming certainties of the natural sciences, often led to the challenging "How do you know?" Students, having been social beings for over two decades, often manifested the alternative responses: If something that was said accorded with their experience they responded with, "So what's new?"; if not, their response was "It's not true." But above all, the repeated question posed was that of the irrelevance to becoming a doctor. The leap of the imagination was indeed difficult.

These dissatisfactions led to a restructuring of the program. Deciding on a considerably greater investment of resources (at the cost of forgetting about the 4th to 6th years), minicourses were instituted. The group of 10 students participating in a 1st- or 2nd-year clinical program for 5 weeks met weekly with a behavioral scientist, clinical psychologist or social worker. Starting from a case history, the sessions were devoted to exploring how the concepts we use (a dictionary of over 200 concepts was compiled) are useful in understanding the clinical program, the patient-doctor interaction, or the workings of the health care system. We would, we hoped, in this way solve the problem of relevance while smuggling in the conceptual tools of the behavioral sciences.

It was sadly amusing to hear, at the end of the 1st year of minicourses, that they were too atheoretical. In response, we reinstituted, in briefer version, social anthropology and psychology. For the next 5 years (1978-83) then, the behavioral sciences input into the curriculum consisted of: Communication and minicourses in Year 1; brief courses in social anthropology and psychology and minicourses in Year 2; the Family Program in Year 3; and occasional single sessions in the Introduction to Clerkships, primary care and psychiatry clerkships in Years 4 and 5. When the first class had reached its final year, we also took part in a full-time 2-week program, *The Physician and Society*, in which competing paradigms, from the biomedical through the Marxist institutional model, were analyzed.

AT THE END OF A DECADE

We had had all the possible advantages that should have facilitated making the behavioral sciences a resounding success. What should be added is that in a survey of students and faculty at the end of the decade, a clear majority were very positive about the importance of the behavioral sciences in the medical curriculum. Yet consensus was clear: in reality, the dissatisfaction that had been with us throughout was, if anything, sharper. There was some anecdotal

evidence that some upper level students and graduates, thinking back, were beginning to see that they had indeed learned something that was important to them as physicians. But there is no way of disregarding the cold fact of dissatisfaction—far from total or universal, but nonetheless very real. What had gone wrong?

I can, of course, only seek to answer this question with all the disadvantages and advantages of the insider, as the key person throughout the decade responsible for coordinating and carrying out the teaching of behavioral sciences in Beer Sheva. Hopefully, my training as a sociologist is of some help in maintaining detachment. I could identify four factors.

First, there is the undeniable fact that of the 10 behavioral scientists who have been directly involved in the teaching over the years, the quality has been variable. This is no less the case for the clinical psychologists and social workers who have participated in teaching. One or two have been quite good, particularly in some areas; one or two were rather poor. Most have been reasonably competent, worked very hard, prepared well—but didn't carry things off. What has become quite clear is that a microbiologist or clinical teacher can afford to be reasonably competent; a behavioral scientist, teaching "what everybody knows," must simply be very, very good if he or she is to succeed. Such teachers are rare, and seldom can be attracted to medical schools. When to this is added the fact that in the eyes of the students they are not being taught by "real" doctors, even the very good are handicapped.

Second, one cannot escape the reality of priority setting by the student. Most acute in Beer Sheva's second year, because of an overloaded schedule it is endemic throughout. At the end of a decade, the dean decreed a 15% cut in curriculum hours; the problem of reading load is yet to be solved. The best-meaning and motivated student, confronted by an impossible load, sets priorities, and the first to be cut is invariably preparation for, or attendance at, behavioral sciences programs. Add to this the fact that the papers important and fascinating to us are often seen by medical students as written in a foreign language, devoid of hard facts, speculative and boring, and lack of preparation for class becomes near certain.

Third, students transmit messages. As the older students moved into the advanced years, and their clinician teachers were largely oblivious to the need to reinforce whatever may have been learned in the earlier years, either through bringing in behavioral scientists or themselves relating to behavioral science issues, the message was passed down: "You

needn't pay much attention to this." Over the decade, we had little or no influence on the clinicians, who remained by and large friendly but unlearned. The fault is perhaps more ours than theirs. The fact remains.

This third issue leads us to the fourth, an issue that may well be the most fundamental one. In considering it, I have often thought of the son who is described in the Passover Hagada as "he who doesn't know to ask." Close analysis of the by-now quite considerable literature about the bio-psychosocial model reveals that what most authors really mean is the psychology of the individual patient, and sometimes family interaction. Clinicians liberated from confinement to the biomedical model may ask about the patient's anxiety or defense mechanisms, but they rarely have learned that there are questions to ask beyond this. In contrast, the strategy upon which the teaching of the behavioral sciences in Beer Sheva had been based is far broader in concept.

This conception has been spelled out elsewhere in detail (4). It encompasses societal and cultural factors in etiology and coping with illness; the psychology of the doctor as well as the patient, and the organizational factors that shape their behavior; the social organization of health care systems; the relevance to medicine of alienation, social mobility, sub-cultural norms, historical context, iatrogenesis, and work stressors. And much more. But, as I have noted above, it requires a leap of the imagination for the student (and clinical teacher) to see how knowledge and understanding of such matters will make him/her a better doctor. Or it requires faith, such as that extended to biochemistry, that they are indeed relevant. And, perhaps, it requires superb teachers. It is much easier to equate the behavioral sciences with the internal dynamics of the patient. The fact that we have failed to educate the clinicians in this

vein is, I believe, at the core of our fluctuating fortunes.

LOOKING AHEAD

This issue of the ISRAEL JOURNAL OF MEDICAL SCIENCES was not intended to be a celebration of Beer Sheva, but a sharing with colleagues of what we have done and what we have learned. With this focus, I may well have sharpened and exaggerated the shortcomings and frustrations, and underestimated the successes. Many who have observed our graduates have commented that, somehow, the behavioral sciences have indeed rubbed off on them considerably. We prefer not to comfort ourselves, but to face the difficulties squarely. At the time of writing, we have just gone through a fundamental reassessment of the behavioral sciences in the curriculum, and have instituted changes. To discuss these would take us beyond the province of this volume.

Whatever happens in Beer Sheva, the fundamental challenge confronting us and all our colleagues elsewhere is how we will respond to Sigerist's challenge with which this paper opened. We can retreat to biomedicine; we can modify this by including the psychodynamics of the patient in the doctor's office; or we can, with Sigerist, see medicine as being also a social science. As I have indicated, this is far from being the only problem, but it may well be the heart of the matter.

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THE COMMUNITY-ORIENTED PRIMARY CARE CLERKSHIP

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The authors feel that the Beer Sheva primary care clerkship differs in two ways from those in general practice, family medicine, and community medicine described elsewhere in this issue. First, it provides an opportunity to teach a major medical school clerkship whose goal is the preparation of students to practice primary care in the same health service, and often in the same regional service, in which they were trained. Second, in the practice setting of Kupat Holim (Health Insurance Institution of the General Federation of Labor), the clerkship has as a major goal not only the teaching of primary care clinical skills, but also community-oriented skills (1), such as community data collection and community problem identification. Third, it is possible in Beer Sheva to evaluate not only the process of the primary care clerkship but also its outcome. In this paper, we shall describe the planning, implementation, and process evaluation of the Beer Sheva community-oriented primary care (COPC) clerkship, both as a case study of the integration of COPC into a medical school curriculum, and in order to determine whether such a clerkship indeed prepares and influences students to practice COPC. Outcome evaluation will be touched upon, but is outside the scope of this paper.

PLANNING

The clerkship was planned in the following four stages: final performance specification, instructional objectives, clinical clerk's job description, and

evaluation. The process of developing a health science curriculum backwards from a performance specification has been described by Segall et al. (2), while Miller (3) and Simpson (4) described the relationship between instructional objectives, teaching methods and evaluation in a medical context.

Job description of the Israeli primary care practitioner

Over a period of 4 months early in 1978, a 14-person team met weekly for 2 hours to write the job description. The 14 team members comprised an expanded clinic team that included physicians, nurses, clinical psychologists, administrators and others. Using nominal group process (5), team members closest to a particular subject area wrote that part of the performance specification, which was then submitted for discussion and modification until consensus was reached. All section headings of the job description are listed in Table 1. Four detailed examples follow (complete copies of the job description and the clerkship objectives in English are available on request):

"1.1: While the physician is evaluating the situation and identifying the problem, he should create a rapport with the patient, relating particularly to what is said 'between the lines'."

"1.2: ...will determine the individual's status within the family life cycle."

"1.3: The physician will view himself as a professional with obligations toward the community, and feel the need to help solve its problems."

"2.2: The physician will be able to make diagnostic and therapeutic decisions in the defined subdivisions of all the most common problems in primary care."

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Table 1. Outline of job description for the Israeli primary care practitioner

1.	Attitudes
1.1	Toward the individual
1.2	Toward the family
1.3	Toward the community
1.4	Toward his work
2.	Cognitive skills
2.1	Basic knowledge
2.2	Primary care knowledge
2.3	Cognitive skills in community medicine
3.	Administration
3.1	Knowledge of health and welfare services
3.2	Definition of the primary care physician's administrative functions

Instructional objectives

The following clerkship goals were defined: knowledge of common organic and psychosocial primary care problems of children, adults, and families; skills in community problem identification, planning and follow-up; effective skills and attitudes appropriate for the primary care practitioner; and skills and knowledge in clinic management.

Using Mager's method (6), these goals were further specified as 12 major instructional objectives, 4 of which were further specified in 17 subobjectives. Table 2 lists the 12 major objectives and Table 3 shows how selected objectives are related to tasks in the job description. For example, objective 5.0 states in part that, "when the student collects data, he or she will demonstrate the following attitudes: establish contact with the patient, with special attention to nonverbal messages; impart confidence; define the visit; attempt to understand the patient's personal and cultural perception of his illness; search for the illness' impact on the patient's life and job; evaluate the effect of the stage in the patient's life cycle on his problems; define the stage of the patient's family life cycle, e.g., courtship, marriage, etc.; evaluate the patient's economic, emotional and social resources and their relationship to family roles; define the interactions between the patient, his illness and his family (7)."

Clinical clerk's job description

Once goals and objectives were defined, the department chairman (C.Z.M.) and two other prospective preceptors defined the clinical clerk's job. Supervised job performance and required classroom learning sessions were chosen as the clerkship teaching methods. Thus, the clerk's job included the following five sorts of tasks: evaluating clinic patients; community work; work during the afternoon (when the clinic is closed) including

Table 2. Community-oriented primary care clerkship: summary of instructional objectives¹

1.	Data collection from patients and families
2.	Problem definition in patients and families
3.	Planning and follow-up
4.	Problem-oriented recording
5.	Attitudes while collecting data
6.	Attitudes while identifying problems
7.	Attitudes when developing a plan
8.	Attitudes during problem follow-up
9.	Community problems: data collection, problem identification and planning
10.	Attitudes towards one's work
11.	Social institutions
12.	Organization of the services

¹ This table presents the titles of the 12 sections of the set of instructional objectives. Each section contains from 1 to 11 specific objectives, written in Mager's (6) format.

Table 3. Selected clerkship instructional objectives and matching tasks from the job description

Instructional objective	Task from job description
1-3. ^a Data collection, problem identification, planning and follow-up	Approach to common and uncommon problems (2.2 ^b cognitive skills)
4. ^a Problem-oriented recording	Approach to common and uncommon problems (2.2 ^b cognitive skills)
5-8. ^a Attitudes while gathering data, identifying problems, planning and follow-up	Attitudes toward the individual and the family (1.1; 1.2 ^b attitudes)
9. ^a Community data collection, problem identification and planning	Attitudes toward the community (1.3 ^b attitudes)
10. ^a Student's attitudes toward his work	Practitioner's attitude toward his work (1.4 ^b attitudes)

^a Numbers refer to those in Table 2.

^b Numbers refer to those in Table 1.

evaluating a family in depth; small group teaching sessions; and videotape sessions. Three of these tasks were divided up into 12 subtasks. For example, "evaluating a patient with a common problem (clerkship objective 1.0)" required a "history, physical examination and problem-oriented medical record appropriate for the problem, either as defined by a clinical algorithm (if available), or according to the students' judgment." In order to learn "community data collection (clerkship objective 1.1), the student must keep a separate log of all patients that he examines, including data on identity, age, sex, complaint, diagnosis and referral (if any). At the end of the clerkship, the student will

summarize the data using simple descriptive statistics." To learn to collect data about and identify family problems (clerkship objective 2.0), "each pair of students is required to work up and present to the clerkship one family in detail, according to the method defined by Medalie (8). The students must interview and examine all family members and must make at least one home visit; most of the workup will be done outside the clinic."

Community Project

The community project was almost always completed during the 6th-year rotation. Students were given "project templates," which consisted of guidelines for performing projects on anemia in children, identifying patients with hypertension, preventing smoking, and screening for parasite infestation in children. Guidelines included definition of the project goal, objectives, methods and identification of a data source that would provide data suitable for studying the problem in question. Students could study the problems outlined in the templates, or could choose a question of interest to themselves and their clinical tutor, which would then have to be approved by the community project consultant. The consultant was either a clinician with epidemiology training or an epidemiologist, who introduced the project on the first clerkship day, was "on call" for questions, and had at least one meeting with each student before he presented his project on the last clerkship day. Students were also required to submit the data from the project to the clerkship coordinator.

IMPLEMENTATION

The clerkship was taught for 4 weeks in the 5th and 4 weeks in the 6th years, which are similar to the 3rd and 4th years in a U.S. medical school. The chief difference between implementing a hospital clerkship and a clinic or practice-based clerkship lies in differing organizational arrangements. Whereas a hospital clerkship takes place within a single department and can usually be monitored directly every day by the responsible educational administrator, even if students are working in several wards, a clinic-based clerkship always takes place in several different clinics. Most of these are at some distance from the medical school, all are independent units, and none can be monitored directly from a central office on an ongoing basis. Implementing such a clerkship requires two different sorts of managerial techniques. First, central tasks to be performed by the medical school department must be defined and executed. Second, tasks to be carried out by preceptors and their teams

must be coordinated. Thus, the clinic-based clerkship is organized like a wheel, of which the medical school department is the hub and the clinics are the rim. The wheel will roll only if its independent parts perform their independent functions and cooperate with each other fully.

Central functions

The "Primary Care Clerkship Manual" was first written in 1978 and has been revised in each succeeding year. It includes the clerkship goals and objectives, the student's job description, the procedures for evaluating both the student's performance and the clerkship, tables of organization of community institutions in general and Israeli community institutions in particular, lists of common acute and chronic primary care problems in children and adults in Israel, the UK and the U.S., and a list of course textbooks.

Since preceptors, unlike hospital faculty, do not work in an academic environment, teacher training (9) for both new and experienced teachers precedes the beginning of the clerkship each year. The training aims to clarify clerkship objectives and administrative arrangements, to provide practice at specific teaching techniques, to clarify evaluation methods, and to decrease the anxiety of the practitioner who has never taught before. We have trained teachers both in weekly short seminars over a 4- to 6-week period and during day-long workshops. Special topics covered have included use and audit of problem-oriented records, teaching tutoring skills using videotaped simulations of the tutoring process, using a checklist to evaluate the student's management of anamnesis and physical examination, teaching communication skills, and use of computerized patient management problems and clinical algorithms to teach workup of specific problems.

Matching students with clinics proved an unanticipated problem that resulted from two interrelated causes: varying distances of clinics from the medical school, sometimes greater than 50 km, and limited mobility of the student, who may have a family and a job. Our solution was to provide students with descriptions of all clinics in advance, and to let them choose the clinics they prefer. The clerkship coordinator spends about 4 days matching students before each rotation. Even if the student gets his/her preference, public transportation to some clinics is inconvenient, and the medical school can afford to subsidize only public transportation. Transportation problems severely limited our initial objective of providing every student with one rotation outside the Beer Sheva region.

On the introductory day, all students come to the medical school for an orientation, including: a discussion of the concepts of primary care and family medicine; receiving and reading through the entire syllabus manual together, including the clerkship schedule; and reviewing criteria for doing the family and community projects and presentations. Day-release (when students are free to attend group lectures at the medical school) activities are held at the medical school weekly and on the last clerkship day; they include discussions of approaches to common clinic problems, practice at small group communication skills, using videotapes of student-patient interviews, family presentations, community project presentations, and a final examination consisting of multiple choice questions and patient management problems. The teaching process and student experience are monitored by one of five or six full-time or part-time members of the Primary Care Unit who visit each clinic at least once and frequently twice during each rotation. At these visits, all clinic-based teaching and learning activities are reviewed with the student and the preceptor according to a checklist.

Peripheral tasks

The student spends all of his time in the community clinic except for his weekly day-release activities. The main task of the clinic and the preceptor is to model the environment and role of the Israeli primary care practitioner. The student is first introduced to the clinic, its staff and neighborhood, sometimes by means of a walking tour guided by the clinic manager. For the first few days, the student observes his preceptor. When the preceptor feels the student is ready, the student is observed while seeing the preceptor's patients. By the end of the 1st week, the student evaluates patients in his own room, discusses his observations and plan with the preceptor, and then implements the plan they agree upon. Experienced students may be allowed to discharge patients presenting with clearly defined problems after only minimal checking by the preceptor. If the follow-up visit is to take place before the student leaves the clinic, he continues to care for the patient. At the end of a clinic session, the preceptor frequently reviews cases of special interest with the student.

Students are also expected to participate actively in all clinic conferences. These are held once or twice a week at midday and are of two types: either the clinic staff meets about clinic and patient problems, or patients are presented to one of the following consultants—social work, psychiatry, internal medicine, pediatrics, or surgery.

The preceptor's other tasks include helping the student to choose and prepare his family for presentation in the clinic and helping him to choose and prepare his community project. The preceptor also facilitates the doctor-patient videotape session, in which a communications expert from the Primary Care Unit videotapes one or two student interactions and reviews the tapes with the student and his preceptor.

EVALUATION

Planning

We feel that much of the vagueness in conceptualizing clerkship evaluation would be dispelled by separating educational process from outcomes, as has been done in evaluation of health services (10). Outcome evaluations, consisting of measures of primary care career choice and measures of the quality of primary care practiced by graduates, are ongoing and reflect a complex of factors of which the clerkship is only one. Results by date are limited by the small number of graduates. Presentation of outcome evaluations would therefore be both premature and outside the scope of this paper. Our process evaluations are of the following three types: cumulative evaluations (11) of achievement of clerkship objectives; formative evaluations; and evaluations by the students in the form of debriefings and written student evaluations. Evaluations listed in Table 4 were designed to determine whether or not a student achieved the clerkship objectives. Our choice of evaluation

Table 4. *Process evaluations of community-oriented primary care clerkship objectives*

Type of evaluation	Clerkship objective evaluated
1. Summative	
1.1 Preceptor rating	Work habits; team work; doctor-patient relationship
1.2 Written and oral comprehension	Knowledge of common primary care problem management
1.3 Family presentation	Ability to evaluate and present a family
1.4 Community project presentation	Ability to plan and execute a clinic-based community project
2. Formative	
2.1 Record audit	Data collection; use of medical record
2.2 Review of videotaped patient interviews	Taking history; performing physical examination; attitudes
2.3 Patient log	Community data collection

instruments was guided by the following principles: First, no instrument can evaluate all objectives, but an evaluation instrument can evaluate several objectives at once. Second, an "overall" preceptor's rating probably does not equal the sum of the preceptor's ratings on specific scales, but has intrinsic value (12). Third, the student must pass each summative evaluation separately, and evaluation of different areas will not be summed up arithmetically. Fourth, the student's final grade is to be assigned on a pass/fail nominal scale by all preceptors as a group, after reviewing all evaluations. As a rule, failure on any two evaluations led to automatic failure and subsequent repetition of the clerkship. However, the preceptor's rating generally weighed more heavily when the preceptor group reviewed evaluations. In practice, if a student passed the preceptor's evaluation but failed other evaluations, he was given a passing grade that was conditional upon successfully passing the failed evaluation. Fifth, three formative evaluations (11)—the students' audited records (13), his videotaped patient interviews (14) and his patient log—were used for feedback only.

The most important evaluation, the personal rating, followed closely the pediatric house officer rating form described by Margolis and Cook (12). It rates the student overall on a 4-point ordinal scale (excellent to poor) and on 19 specific 6-point ordinal scales that evaluate the areas of empathy, work habits, knowledge and clinical judgment, and teamwork, most of which were clearly defined by Shattuck (15) in 1906. Space for unstructured comments and critical incidents is also provided. Preceptors fill out the evaluation forms and discuss them with the students at the end of the clerkship.

Family projects are presented to the clerkship group and are rated by at least two faculty members according to rating scales derived from Medalie (8) and Smilkstein (16). Community projects are presented to the entire clerkship group and at least one of the community project tutors at the end of the rotation. Grades are pass/fail, and the minimum criterion is that project data be submitted to the project tutor for review.

Written and oral comprehensive examinations are given just before the end of the final (6th) year to determine knowledge of primary care problem management. Written examinations consist of 100 items covering the range of common adult and pediatric problems defined in the syllabus. Oral examinations consist of structured interviews by two faculty members on one pediatric and one adult management problem (e.g., a 41-year-old woman with a headache; a 10-year-old boy with recurrent

abdominal pain). Faculty members have a complete set of acceptable answers in front of them as they interview, thus minimizing haphazard or irrelevant questions. Scoring for correct answers is also defined in writing, and each problem is given a maximum grade of 50 points.

While students are evaluated using the above techniques, the clerkship is evaluated by means of the debriefing session (17). This session is held at the end of each rotation by the Year Committee that has executive responsibility for managing the year, and the Curriculum Planning Unit. Students also evaluate their clinic preceptors and specific activities of the clerkship using questionnaires adopted from Irby and Rakestraw (18) and McKeachie (19).

EVALUATION RESULTS

Preceptor ratings

Fig. 1 shows that the average "overall" rating for 176 clerks in the first five cohorts was high ($87.4\% \pm 6.3$ mean \pm SD). Cohorts did not differ significantly from one another. Analysis of the 19 ordinal scales gave similar results. The failure rate was 1/176 (0.57%). This student repeated and passed the clerkship with the next cohort. Eight students (8/176, 4.5%) who passed all other evaluations and were given borderline passing receptor ratings ($<70\%$) had their performance reviewed in detail in their presence by the department chairman and the preceptor.

Written and oral examinations

Fig. 1 shows that the mean oral examination score for the first five cohorts was 82.0 ± 8.5 , and the mean written examination score was 75.5 ± 5.7 . Again, no significant differences were demonstrated between cohorts. However, as shown in Fig. 1, mean written examination scores were lower than mean oral examination scores, which were lower than mean preceptor ratings across all five cohorts; 14 of the 15 possible differences were statistically significant ($P < 0.05$) using the Student's *t*-test. Standard deviations were greater for the oral examinations than for either of the other evaluations, but the mean oral examination scores approximated mean final grades most closely.

Family presentations

All 176 students individually or in pairs, presented the following elements of a family presentation successfully: index patient's history, physical examination and problem list; three-generation family tree; major problems of family members; intrafamily relationships; pertinent socioeconomic and household family data; family support systems

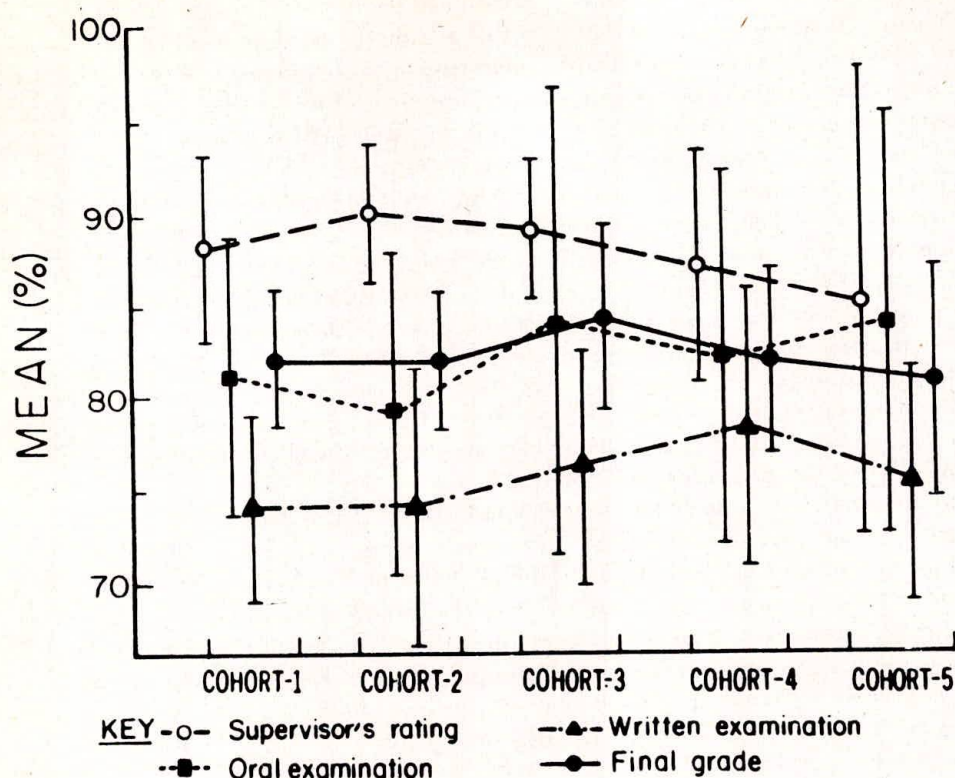


Fig. 1. Rating of the first five cohorts.

(i.e., community, religion, etc.); family problem list and management plan, and prognosis. A list of critical events in the family's history was almost always presented. Examples of family presentations are given in Table 5.

Community project presentations

All students but one successfully completed community projects that included the following elements: data analysis, conclusions and project presentation. The one student who failed presented a discursive and inconclusive description of his clerkship experience at a distant community hospital. Examples of projects are given in Table 6.

Table 5. Representative family presentations

1. The family of a 50-year-old man with "frozen shoulder" who has stopped working.
2. The family of an 18-month-old girl with Tay-Sachs disease.
3. The family of a 10-year-old girl with uncontrolled diabetes mellitus.
4. The family of a dying 12-year-old boy.
5. The family of a 4-year-old girl never operated on for congenital bilateral cataract.
6. The family of a 46-year-old obese woman.
7. The family of a 21-year-old suicidal woman with depression.
8. A family with familial deafness.
9. The family of a 14-year-old boy with Down's syndrome and severe retardation.

DISCUSSION

The process of defining a performance-based medical curriculum has been described in detail by Segall et al. (2), whose work is based on a large number of articles on job performance specifications in other fields (20). Precise job specification determines the definition of instructional objectives, which in turn determine the choice of instructional and evaluation methods. The relationship between objectives, methods of instruction and methods of evaluation was described in 1962 by Miller (3), and was based on work by Tyler (21), Bloom (22), and Mager (6). In planning, implementing and

Table 6. Representative community projects

1. Hemoglobin survey in children under 2 years old.
2. Cholesterol levels in kibbutz members.
3. Stool parasites found in a pediatric clinic serving 5,000 children.
4. Use of medications in the town of Netivot (pop. 8,500).
5. Attitudes toward smoking in the town of Netivot.
6. A survey in a kibbutz community of risk factors for heart disease.
7. Transmission of tonsillitis within a family in the development town of Yeruham (pop. 7,000).
8. Demand for sick leave in the summer and in the winter in a Jerusalem neighborhood clinic practice (practice pop. 10,000).
9. Common medical problems in a neighborhood clinic in Beer Sheva practice (pop. 10,500).
10. Hospitalization rates in the winter and summer months in a neighborhood clinic in Beersheva (practice pop. 9,000).

evaluating our clerkship, we followed the method of Segall et al. closely in order to arrive at a clinical clerk's job description that bore a one-to-one correspondence with the job description that we envisioned for the Israeli primary care practitioner. Our experience demonstrates that performance-based medical curriculum definition and implementation is feasible, at least in our setting. Although elements of this planning process have been used in the past (23), we believe that ours is the first published example of the completed process, which was made possible by the merging of regional health services with the medical school. We would argue that the curriculum planning process used to plan or replan clerkships should be performance based in order to maximize the relevance of a particular clerkship to the knowledge, skills and attitudes used by practitioners.

Content of a clerkship planned using this method will vary from setting to setting as the performance specification varies. However, review of published descriptions of family medicine, primary care and community medicine clerkships (24-26) shows that a minimal set of objectives for this type of clerkship has emerged that includes at least the following three types of objective: knowledge about a set of common problems seen in a clinic or practice; attitudes appropriate for primary care work; and skills for gathering family data, defining family problems, and presenting families to a professional audience. A fourth type of objective, first defined by Kark (1), describes skills at gathering community data, defining community problems, and planning to solve them. This sort of objective has not always been included in the primary care clerkship. However, community-oriented objectives are highly relevant to the job of the Israeli primary care practitioner. Moreover, both Mullen (27) and the policymaking bodies in American family and community medicine (28) have suggested that COPC should become the new standard for American primary care practice.

Students at Ben-Gurion University have more than the average preclinical coursework in epidemiology and communications skills (2). Thus, when they begin their primary care clerkship, students have completed a 160-hour, 2-year course called *Quantitative Thinking*, which includes biostatistics, epidemiology, and project work at a MPH (Master of Public Health) degree level. In their 3rd, preclerkship year, many do a family project in which they present an oral and a written report on their evaluation of a family. These courses, which prepare the student early in his training for concepts and content that will be taught later at a higher level

of sophistication, are an example of the "spiral curriculum" concept developed by Segall et al. (17) that has guided curriculum development at our medical school. This extensive preclinical coursework can be viewed as preparation for the clerkship. However, our clerkship could be taught as described without these preparatory courses, albeit, we assume, at a lower level of sophistication.

We believe that any medical school should provide significant primary care experience, especially if it aims to prepare specialists. Only in the primary care setting will the student experience strong emphasis on the patient, his family, and his community, in contrast to the orientation towards diseases of many specialty clerkships. Also, only in the community will the future specialist perceive the scope and limitations of the primary care environment that will provide most of his referrals. Such a clerkship may also provide one of the only environments in which a senior physician has daily, concentrated contact with the student that may provide significant data regarding the student's noncognitive performance. Furthermore, although concepts developed within family and community medicine must be taught during a COPC clerkship, teachers do not have to be family practitioners, but, may also be pediatricians, internists, or other physician role models, who are devoted to providing quality primary care.

At present, we can only speculate about the influence of the COPC clerkship on career choice. The first five cohorts enjoyed the clerkship, but frequently had neither the appropriate role models nor the appropriate work environment that would induce them to practice primary care. However, it is reasonable to assume that our first two cohorts comprised a relatively large percentage of students who were explorer or pioneer types, attracted by difficult situations. For these students, a primary care clerkship that allowed them to experience primary care with all its problems may have increased their motivation to change primary care. The clerkship showed them clearly that there was a problem of specific dimensions needing change, and that the faculty wanted to achieve change. Now that the University Center-Kupat Holim partnership is beginning to effect change in the incentives of the primary care work environment, and an increasing number of family medicine, pediatrics and internal medicine residents are choosing to work in primary care settings, students will have appropriate models who will encourage them to view these incentives positively. If these developments continue, we may now begin to hear students talk of the COPC clerkship as a deciding factor in their career choice.

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PROBLEM-BASED CLINICAL CONFRONTATION MODULES PLANNED AND CONDUCTED BY STUDENTS

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Problem-based modules were introduced into the basic science-structured curriculum during the first 3 years. These modules comprise a course entitled *Clinical Confrontation*. The course attempts to teach problem-solving skills, integration and to show the students the relevance of the basic sciences by discussing a clinical patient's problem and using previously acquired disciplinary knowledge. The course is organized in small group tutorials by senior students who participate in the planning and writing of the clinical problems and serve as the tutors of the learning groups.

COURSE RATIONALE

A group of senior students felt insufficiently prepared for their clinical clerkship and were having difficulties in integrating and applying basic science and general knowledge to real-life cases. This problem was identified during debriefing sessions (1) when the students stressed the deficiency of an earlier course that was to remedy the insufficient integration of basic and clinical knowledge and to develop problem-solving skills.

The *Clinical Confrontation* Course shares many features and advantages with similar courses, sometimes called problem-based courses (2), case study methods, and introductory courses. In most traditional medical school curricula, the basic sciences are distinctly separated from the clinical studies. The basic sciences, which are studied during the early part of the medical curriculum, are taught by basic

scientists who usually are not physicians. This distinct separation appears to cause frustration among the preclinical students. The students are unable to grasp the relevance of the vast amount of basic science studies to their future clinical work. Janet Gale Grant (3) points out: "In clinical practice there is no similar separation of subject and discipline knowledge." Furthermore, the student cannot perceive the connection between the various basic science subjects which are learned. This misperception of relevancy by the students may diminish their motivation to fully understand basic sciences (4). Instead, the students invest their energies in rote memorization of the material with one goal in mind—to complete successfully this necessary but irrelevant part of their medical studies.

The *Clinical Confrontation* Course intends to fill this gap by modeling the relevancy of basic science knowledge to the clinician's work. While grappling with the clinical problem, the student learns at the very early stages that basic science knowledge is essential to understanding a clinical problem and that within a specific patient context the basic science interpretation of the clinical findings may vary from one case to another.

In summary, the course objectives include: 1) development of problem-solving skills as they are applied to clinical cases; 2) integration between the different courses in the preclinical years; 3) raising the motivation to better understand basic science; and 4) fostering self-learning skills by enhancing students' curiosity (finding solutions for their case).

STUDENTS AS TEACHERS

It is not surprising that the initiative for a clinical

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confrontation course during the first years of the curriculum came from the Beer Sheva students themselves (as described above). The Beer Sheva educational philosophy emphasizes the students' active participation in the program. It was noted that the senior students themselves might be the best planners and facilitators of such a course. Some of the senior students were acutely aware of these curricular shortcomings and were particularly able to identify the needs of the younger students. Furthermore, they could improve the motivation of the younger students by assuring them that the course is indeed needed. By devoting their own time and effort, senior students demonstrated the importance of the course. Such motivation is apparently needed, as Duban et al. (5) reported that although the importance of such a course is acknowledged by most medical schools, students and teachers often perceive its importance to be secondary and divorced from the main curriculum. An additional problem of extra teaching responsibilities was raised by Lambie et al. (6) in their experience with a similar course at Edinburgh. But the involved Beer Sheva senior students, most of whom were excellent academically, gladly volunteered to teach the course. This course also serves as the beginning of a process of recruitment and training of future teachers and educational leaders.

During our 5-year experience with the course, we have learned that the senior students act as nondisciplinary role models. The younger students may identify more readily with the senior student who is still engaged in the process of internalization and application of basic sciences to clinical cases than with the specialist who may have already become insensitive to such a process.

COURSE DESCRIPTION—METHOD AND PROCEDURE

The course is given during the first 3 years [of the 6-year program (7)]. The 1st year's course is described as an example of the rest. The 1st-year class is divided into 3 to 4 groups, each comprising about 12 to 15 students. Throughout the year, each group will discuss three to four clinical cases. The cases are designed to match the appropriate knowledge level of the student at that time and are relevant to the acquired knowledge at the different preclinical courses. During the 1st year, the students grapple with three clinical cases each in four 2-hour sessions and one 4-hour summary session.

Prior to the first session, the clinical-case story is distributed to the students. The students are asked to prepare a list pertaining to three aspects of the case: problems, differential diagnosis (DD) and addi-

tional information or tests needed to confirm the DD. The tutor serves as a guide, discusses the case in accordance with the three above-mentioned aspects, and assigns projects in order to clarify questions that were raised during the discussion.

The students are usually guided to look up the relevant literature through a self-search, self-learn process. Faculty members are also available as an information source. The tutor has available the results of diagnostic tests prepared in advance, including X-rays, ECG, blood and urine tests, etc.

At the second session, a continuation of the case is handed out to the students. This additional information usually marks some significant development in the clinical case discussed. Once again, the students are asked to prepare a list pertaining to the three above-mentioned aspects, but this time more information about the case is available. The remaining sessions are handled in similar fashion. The assignments are given either to individual students or to the group. The fifth session summarizes the case, and usually a panel of relevant experts is invited to this discussion. For example, the second case in the 1st-year course deals with an epidemic of diarrhea in children. The student is assigned to serve as a committee member who investigates the outbreak of the epidemic. In this clinical case, the student relates to the individual patient as well as to the community. When treating the individual patient, the student learns how to use the knowledge acquired in the physiology (body fluids), clinical (acid-base problems), and life saving (treatment for severe dehydration) studies in order to solve the clinical problem, as well as to use the skills learned in communications and behavioral sciences when dealing with the parents of a sick child. While relating to the community, the student uses the knowledge about epidemics learned in the epidemiology course and practices this knowledge in real life. He investigates both the various services available in the community for such an epidemic and the physician's role in such cases.

Some difficulties were encountered during the 5 years of experience with this course. The first is that the course competes for student's time with the tight and demanding curriculum. The reality thus dictates a limited number of cases during each year, which may be insufficient for some students. This disadvantage is only partly compensated by continuing the course in the 2nd and 3rd year of preclinical studies. A second problem is that it becomes extremely difficult to evaluate the course, as the students' achievements may derive from different sources in the curriculum. The evaluation of the course is at present at its starting point. However, the course is favorably accepted by the students, as

reflected by the large amount of time they are willing to devote to it.

SUMMARY AND CONCLUSION

A course has been described which attempts to introduce clinical relevancy to the basic science knowledge. It has been demonstrated how senior students' feedback about curricular shortcomings can be redirected to their constructive participation in the educational process. The described *Clinical Confrontation* course develops problem-solving skills and self-learning habits in the learners while they are processing and rearranging prior knowledge. At the same time, both the scientific base of medicine and the internal logic of the disciplines are preserved.

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Lecture in Beer Sheva, 1975

"The Beer Sheva experiment is a very bold and farsighted one which deserves attention and support from all concerned. It is unique in that it is based on the realization that health services and health manpower development should be changed in a synchronized way if results are to be expected. The basic change is the education of future doctors, built on the integrated and community-oriented physicians who are ready to serve people instead of being hospital and disease oriented. This would mean a very important step forward in the history of health personnel education."

EMERGENCY CARE CURRICULUM OF THE BEER SHEVA MEDICAL SCHOOL

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When the Beer Sheva University Center for Health Sciences and Services (UCHSS) was established in 1974 it received a dual mandate (1). The first was to utilize academic resources in fostering the development of an integrated system for the delivery of comprehensive regional health care. The second was to educate a new type of physician who would have the motivation and competencies to function effectively within this system. This latter commitment implies that along with the basic elements of medical education the primary care and emergency care dimensions would be emphasized in a manner not characteristic of other medical schools. A 6-year competency-based curriculum reflects the goals of the faculty. Basic sciences, clinical medicine with a special emphasis on emergency medicine, and public health constitute the principal areas of teaching. Instruction in each area begins in the 1st year and continues throughout the 6-year program. The complexity of problems and the level of simulation increase progressively as students advance through the several phases of the curriculum. This spiral concept of curriculum adopted in Beer Sheva is based on the premise that learning and retention occur more effectively when reinforced concurrently across diverse components of the curriculum and longitudinally over successive phases of the study program. Furthermore, these concepts also meet the need for introducing emergency medicine courses at the undergraduate level (2-5) as summarized in the *Lancet* (6) a decade ago: "The implication that one

can graduate in medicine with distinction while unable to avert disaster in practical clinical situations is thought-provoking."

DESCRIPTION OF THE EMERGENCY MEDICINE CURRICULUM

Emergency medicine teaching—first 3 years

The duration of the first phase of the emergency medicine teaching program is approximately 3 years. Formal courses and workshops are supplemented by several clinical tracks which enable students to practice the basic skills in a clinical setting. The basic clinical competencies taught at this stage of the curriculum require minimal theoretical background.

First-year Emergency Medicine Program. During the 1st year of medical studies a 54-hour first aid course (18 sessions) is integrated into the basic physiology course. The first aid course includes basic cardiopulmonary resuscitation (CPR), basic traumatology, basic first aid in medical emergencies, and the principles of dealing with multiple injuries and of triage. The course is taught by medical students who had been paramedical instructors during their army service. The students are trained using dummies for basic life support, and they practice i.v. infusions as well as bandaging and immobilization on each other. A computerized simulator developed by the School of Military Medicine of the Israeli Defense Forces (IDF) Medical Corps is used as a teaching aid and for practicing triage. The students' knowledge and practical skills are evaluated at the end of the course, using a multiple-choice written examination and simulating an accident with four wounded per-

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sons. Passing the first aid course and examinations is a prerequisite for 2nd-year medical studies. In addition to the first aid course, the students are exposed to the Emergency Room during their "clinical day" described elsewhere in this volume. During this day in internal medicine the students' exposure to the Emergency Room emphasizes the impact of the acute and sometimes life-threatening situation on the individual and his or her family. The students learn the difficulties of communicating in this kind of setting with special emphasis on the relationship between the physician and the patient and family.

Second-year Emergency Medicine Program. Based on the 1st-year first aid course the students are exposed to the Mobile Intensive Care Unit run by Magen David Adom (the Israeli equivalent of the Red Cross) during the 2nd-year medical studies. This exposure brings into reality the subjects taught during the 1st year and introduces the student to non-hospital emergency systems. The students are required to submit a medical report on this experience as a prerequisite for the 3rd-year medical studies.

Third-year Emergency Medical Program. During the 3rd year, anatomy and physiology are taught according to the body systems. Emergency medicine is integrated with anatomy by teaching and practicing different emergency surgical, diagnostic and therapeutic procedures, such as thoracic drainage, tracheostomy, abdominal tap, etc. on the cadavers. These skills are taught by the senior surgeons in the Emergency Room, and emphasis is given to the anatomic structures that are involved and at risk during these procedures. This integration between emergency medicine and anatomy enables emergency procedures to be introduced at this stage of training and to be practiced in a classroom setting. Furthermore, the students' motivation in studying anatomy is thereby enhanced.

Issues of emergency care are incorporated into the classroom studies of each of the integrated body systems. These issues include topics such as diabetic ketoacidosis, hemolytic crisis, acute gastrointestinal bleeding, etc. Following the cardiovascular, respiratory and nephrological systems and based on the theoretical knowledge learned in those systems, a 1-week advanced life-support workshop (32 hours) is given. Preceding the advanced life-support course, there are refresher sessions in first aid and basic life-support skills. In addition panel discussions are held concerning issues such as burns, shock and multiple injuries. The students are evaluated by means of a written and practical examination.

Supervised evening shifts in Surgical, Medical, and Pediatric Intensive Care Units follow this workshop, using the emergency medicine skills and experiences booklet described in the following section.

The emergency medicine skills and experiences booklet

During the 1st year the students are given a booklet, "The skills and experience booklet," which lists the skills and experiences that the student must acquire during the 6-year program. Some of the skills have to be learned during the first 3 years—the early clinical program—and are a prerequisite for the 4th year. These skills and experiences involve mainly the initial exposure to emergency situations. Another section of the booklet has to be completed during the 4th year while the student acts as a clerk in medicine and in pediatrics. During this year, the skills involve exposure to emergency situations and procedures, such as acute myocardial infarction, pulmonary edema, severe dehydration, central venous catheterization, nasogastric intubation, and urethral catheterization. Emphasis is placed not only on the presence of the student during the emergency situation, but also on the presence of the student during the explanation given to the patient and his family concerning the condition or procedure. In order to be exposed to medical emergencies, the 4th-year medical students have to complete at least five nights on duty in the emergency room.

Emergency medicine teaching—later years

During the 5th and 6th years, the student is expected to complete all of the functions described in the booklet. During those years, the student acts as a clerk in surgery, orthopedics, anesthesiology, primary care, obstetrics and gynecology, medicine, and psychiatry, and is exposed as well to the Respiratory and Coronary Intensive Care Units. During these years, the student has to participate in emergency situations and procedures including resuscitation, treatment of acute psychoses, drawing arterial bloods, intubation, etc. During the different clerkships formal discussions are held concerning management of emergency situations in the different fields of medicine.

During their rotating internship in the 6th year before the students are expected to act as physicians, a formal 1-week workshop (38 hours) in emergency medicine is held. This workshop includes a review of basic and advanced life support and discussions of emergency situations in medicine, pediatrics, obstetrics and gynecology, and traumatology, as well as a practical simulation of emergency room treatment of a mass injury.

Participation in this workshop as well as completion of the emergency medicine skills and experiences booklet is a prerequisite for starting the internship.

DISCUSSION

It was clear that emergency medicine should be an important issue in the curriculum of a new medical school whose aim was to educate a physician with a humanistic and a community approach (7). There was also general agreement among the medical and social science staffs of the new medical school that emergency medicine should be included as a required course and that the traditional way of teaching emergency medicine was unsatisfactory. The emergency medicine program described here is based on the following hypotheses: 1) The community expects even a 1st-year medical student to be able to cope with emergency situations better than a layman does. 2) Several skills such as communication and basic paramedical skills are more readily accepted and learned by undergraduate students before they get too involved in the different clerkships. 3) The medical school should prepare the medical student in a gradual and repetitive way to cope both theoretically and practically with emergency situations, inside and outside the hospital, before throwing him or her virtually unprepared into the roles of medical clerk, intern, and practicing physician.

Furthermore, the curriculum was based on the basic principles of the new medical school, which were: 1) clinical involvement of the student from the 1st year of the 6-year program; 2) teaching according to the body systems and in an integrated and spiral way; 3) involvement of medical students and young graduates in creating the curriculum and teaching; and 4) constant feedback mechanisms from students, teachers, and the medical and nonmedical community in order to closely approximate the basic aims of the medical school.

Based on these principles, the emergency medicine curriculum was constructed and constantly improved. The curriculum described here is the latest version and has been in effect for the last 3 years. Its aim was to spread and integrate the *Emergency Medicine Program* into the 6-year medical school curriculum in a manner that would assure that emergency medicine would not be neglected, thereby training physicians to cope with emergency situations in the field as well as in the hospital.

A program like the one described here can succeed

only in a medical school where the contribution of emergency medicine-oriented physicians is welcomed and taught in every field, system or clerkship of the 6-year program. Although emergency medicine was taught in the UCHSS from the start and the authors have always been deeply involved, the 6-year *Emergency Medicine Program* has only been established relatively recently. Full evaluation of this program has thus heretofore been impossible. In a preliminary study presented in this issue of the Journal, Drs. M. Prywes and M. Friedman have shown that the UCHSS interns received a significantly higher rating for technical skills than did graduates of other medical schools in Israel. These results are not specifically oriented towards emergency medicine skills, but are nevertheless encouraging and relevant. We are in the process of evaluating interns from the different medical schools, specifically concerning knowledge and skills in emergency medicine. Furthermore, we hope that with the help of the School of Military Medicine of the IDF Medical Corps we will be able to compare UCHSS graduates with those of other medical schools, concerning emergency issues taught and evaluated during the medical officers' course given by the IDF to almost all Israeli physicians.

In conclusion, we have the impression that our emergency medicine curriculum is on the right track; we are getting substantiation of this view from the community, the army, and Emergency Room directors, as well as from our students, graduates and staff. Emergency medicine, like every other curricular component, should be thoroughly and objectively evaluated to determine whether it fulfills its aims and goals.

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LACUNAE IN THE EDUCATIONAL PROGRAM

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Key words: Beer Sheva Experiment; medical education; medical ethics; medical history

As a medical school with pretensions well beyond our capabilities, with an overwhelming desire to prove ourselves as not only innovative in many areas, but at least as adequate in the classic medical school roles, we often find that our appetites are larger than our digestive capacity. The curriculum of the medical school, with the added load of hours of early clinical exposure, behavioral sciences, community projects and the like, is already the most extensive of all Israeli medical schools. And yet, there remain numerous lacunae in the curricular program that we would like to fill and present to our students. The obvious gaps have resulted in part because of a lack of staff in a particular area. In other cases, sporadic attempts to teach the subjects have been made in accordance with the time, personnel and interest available during a particular semester. These efforts have helped us formulate ideas in new areas with the hope that these ideas can be put into effect in future years. I will address just some of the gaps in our curriculum.

MEDICAL ETHICS

It is generally agreed that the subject of medical ethics is essential for a physician's education. We devoted much time and effort to planning an organized course in medical ethics but have not had the staff to fully activate the course.

The guidelines along which we organized the course were as follows:

1) The course would not be given as a single short

course, subsequent to which ethics would not be touched upon again. We did not want the student to have the feeling that he/she had "finished" the course in ethics.

2) We would attempt to introduce the subjects under discussion at the stage in the student's education when they become relevant to him/her. Thus, confidentiality might be taught in the 1st year when the fledgling students in their first clinical encounter are suddenly exposed to the intimate details of patients' interpersonal relationships. Abortion might be discussed relatively early when the student begins to interview pregnant women. Truth telling could be dealt with during the course on cancer in the 2nd year, and so on.

3) No definitive solutions would be presented to complicated ethical issues, but rather the students would learn to define the issues in a case discussion format, and they would be required to consult the relevant literature and present different points of view as expressed in these articles. Our students and faculty represent a spectrum of often widely divergent philosophies and *Weltanschauungen*, and a consensus on "right" answers is not always possible.

An effective format that we found stimulating and thought provoking involved the assignment of several short cases illustrating the spectrum of the ethical dilemmas on the subject under discussion together with appropriate reading assignments. The class was then divided into small groups to discuss the problems, using their own insights and those gained from their reading. Subsequently the groups reassembled and heard several experts present their views, followed by free discussion. This format was enjoyed and appreciated by students and faculty alike. It is, however, quite costly in terms of faculty

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time and requires the importation of outside experts from other cities in Israel and considerable logistical manipulation for each teaching session.

Presently, ethics is taught largely in the 6th year as part of the course *The Physician in Society*. Students, rather than outside experts, present the varying points of view based on individually assigned reading, and active class participation is encouraged. This has been an effective and popular format. In addition, in earlier years sessions on various topics in medical ethics appear during different courses rather than as part of a separate course in ethics. Thus in the 2nd year during the clinical week on cancer, several sessions are spent on the approach to the dying patient and on truth telling.

HISTORY OF MEDICINE

For several years (during the introductory summer months preceding the first year), while an interested faculty member was available, we gave a short course in the history of medicine. The course was given at that particular juncture in an attempt to provide the student entering upon a career in medicine a historical perspective on the development of medicine from ancient times to the present day—as a function of the different cultures and eras. The course was based on a focus of specific medical personalities from different eras in medical history.

The course was generally well received by the students, but it was felt, ultimately, that offering the course at the outset of the students' education was not ideal since they lacked the tools and background to properly appreciate medical history. The course was eventually discontinued because of the subsequent unavailability of the faculty member who gave the course. We made another attempt to give a course in medical history as an elective in later years, but poor student participation led to its discontinuation.

HUMANITIES

The subject of the humanities in Israeli education in general and in medical education in particular is a sore point among educators who are used to the American concept of a broad university education for the professions. Israeli university students, beginning as they do after several years of military duty, are of necessity very pragmatically oriented, and they regard the university largely as a place to receive an education that prepares them to earn a livelihood. Their major course of study is selected at the start of university studies and almost all courses are confined to the major course or to closely allied subjects. Medical school is no different, and probably is even more restrictive, because of the large

number of required hours in the sciences and the overall study load.

In addition, our medical school has chosen to add hours in early clinical exposure, community projects, as well as behavioral sciences, leaving the student to stagger under an inordinately heavy work load. Adding further hours in the humanities has never been seriously considered, although the unfortunate lack of such broadening courses is frequently lamented at faculty meetings. We are considering simply setting a specific afternoon free on an ongoing basis and encouraging students to take their own choice of courses in other faculties of the University.

MISCELLANEOUS OTHER LACUNAE

Other areas in which there are clear gaps in the curriculum are those of human sexuality, forensic medicine, nuclear medicine, alternative medicine, and computer science. In a congested curriculum, courses without sufficient priority and an appropriately strong faculty member to lobby for them and organize the teaching tend to be neglected.

In some of these areas, the immediate future would seem more optimistic. For example, this past year witnessed the creation of a Center for Jewish Medical Ethics at the medical school. It is to be hoped that such a center with its focus will serve to catalyze a better organized program in medical ethics. We have also begun a course in human sexuality for the coming year. In addition, we are providing free hours in the first years of medical school and require that students take courses in other faculties. No similar prospects are on the horizon for some of the other lacunae.

We have taken one step this past year that may make it easier to introduce new courses in the future. Because the inordinately large work load thrust upon the students began to be counterproductive, the school cut the class hours in the first 2 years of medical school by 15%. This precedent, if extended and utilized intelligently, may permit curricular supplementation and augmentation in the future, in line with curricular development.

In considering the present gaps in our curriculum and others that have not been noted, the fundamental issue that needs to be confronted is the all-too-common tendency of each department to attempt to teach far more detail in its area than is reasonable, necessary, or relevant. With the geometric increase in scientific knowledge, without a concomitant increase in the human mind's capacity to absorb, remember, and apply this knowledge, major changes in curricular concepts must be made with a significant reduction in the teaching of detail and greater emphasis on broad concepts and an approach to

learning. In the coming years, if we succeed in this challenge, the question of specific gaps in the curriculum might then be addressed in a more comprehensive and imaginative manner.

We are fortunate with regard to our organization, which concentrates much of the decision-making power about curriculum in the faculty's Medical Education Unit. This central unit responsible to the Curriculum Committee has been given considerable authority for far-reaching curricular changes over the special interest groups that characterize every faculty. This organizational structure makes it easier

to review, evaluate, plan, and execute curricular changes in position or direction.

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Preliminary Report on the Ben-Gurion University Center
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"A critical factor in the present and future viability of the Beer Sheva medical program has been the visionary and competent leadership at the helm. Moshe Prywes, the founding dean, articulated the goal of integration of a community-oriented system of medical education with the health services of a developing region. He was masterful in promoting the program and foreseeing potential obstructions. A key tactic was the designation of Soroka Hospital as a teaching hospital and the department chiefs as medical school teachers to preclude severe contention between the medical school and the regional hospital. Throughout this period, quality of care and medical service were not sacrificed and Prywes espoused improved primary care.

Prywes' leadership was followed by that of Lechaim Naggan. Naggan's commitment to the same ideals and international stature as an epidemiologist facilitated a smooth transition from the founding dean. His different leadership style—one of process and attention to putting systems and structure into place to support Prywes' acclaimed ideals—is respected and he is seen as skillful and convincing in his use of governance processes.

In the case of both leaders, their main source of power has come and continues to proceed from the dual role as head of the health services and the medical faculty. Both see the control of the health services as the overriding factor in matters vis-a-vis BGU and/or the Faculty of Medicine.

The Beer Sheva Experiment has become institutionalized and the justification for the program—the integration of medical education and medical delivery—has been realized by the successful partnership between the school and

Kupat Holim. The medical program at BGU embodies a philosophy of health care service as the overall mission with medical education as the means to this end. Concomitant with this mission is a growing agreement among faculty to the community orientation and holistic approach to patients. Faculty attrition and the recruitment of new, like-minded faculty has served to strengthen this philosophy.

A combination of extraordinary leadership and *esprit de corps* among students and faculty seems to contribute to sustaining Beer Sheva's viability, especially as shown in the numbers of graduates who remain in the Negev to practice.

The program's present and potential for future success is reflected in various areas: the fostering of attitudinal values oriented toward the doctor/patient relationship, teamwork, community and preventive health care, increased availability of primary care and specialty physicians for the Negev region; the promotion of regional policies toward Primary Health Care; and of great importance, the integration of hospital care, ambulatory care and community medicine. (Beer Sheva's future impact on increased numbers of primary care practitioners may be more difficult to discern given an apparent national trend for more medical school graduates to take up primary care medicine due to limitations in speciality positions and economic forces within the health care system.)

Strengths of the program are many. The congruence of school goals with institutional objectives is supported by a similar congruence of the goals/objectives with the evaluation system, admissions process and professional socialization throughout the program. The actual presence of the medical student in the community setting from the beginning of the program effectively communicates the importance of the community-based orientation of the program."

HAS THE QUALITY OF THE HEALTH CARE PROCESS IN THE NEGEV IMPROVED?

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Key words: Beer Sheva Experiment; medical education; health care services; Negev, Israel; community medicine

The goals of the University Center for Health Sciences and Services (UCHSS) were, and still are, to create an integrated health system that combines preventive, curative and rehabilitative care as well as primary, secondary and tertiary care, and to train physicians and other health personnel who will be prepared to work in such an integrated health system. In simple words, the aim is to improve the quality of health care in the Negev, with an emphasis on community health services. This emphasis stems from the observation that while almost all medical schools improve hospitals by converting them to teaching hospitals, rarely do these benefits penetrate the ambulatory health system, because traditionally, most clinical teaching of medical students takes place in hospitals. The changes that have occurred at the Soroka Medical Center are described elsewhere in this issue. This paper will address the effects on the total system, emphasizing the impact on the organization of primary care. The issues addressed include the impact of health manpower development, academization of the community health professions, organizational changes that succeeded and those that failed, and a short description of the major changes in the practice of primary care in the Negev.

HEALTH MANPOWER DEVELOPMENT

The selection process of medical students, the curriculum, which includes large components of social and behavioral sciences and community medicine, as well as the whole philosophy of the UCHSS facilitate

the training of community-oriented physicians. Such physicians will not necessarily choose family medicine as a career, but should be sensitive to the total health problems of their patients and will hopefully tend to function well in a health system that combines tertiary and primary care. Evidence of this orientation is seen in the 48% of our first four graduating classes who volunteered to serve in primary care facilities for at least 1 year postinternship. Sixty-three percent (total $n = 82$) of these have chosen either internal medicine (31%), pediatrics (19%) or family practice (13%) for their residency, compared with 53% of graduates (during 1980-84) in other Israeli medical schools (total $n = 555$). The numbers are too small, and it is too early to predict future trends. But it seems clear that training received at the medical school prepares our students to function well in both tertiary and primary care systems. Significant as well is the fact that thus far 50% of our graduates have remained in the Negev Kupat Holim (Health Insurance Institute of the General Federation of Labor) system, thus producing a cadre of fresh, well-trained physicians in all our residency programs.

The Recanati School for Community Health Professions trains nurses and physiotherapists in the same manner, and its graduates function well in both primary and tertiary care systems. There are special programs to upgrade and expand the training and skills of community nurses in the area of public health and clinical assessment. Most teachers of the medical school also teach at the Recanati School and therefore the methods, curriculum, and concepts are the same.

Because of the emphasis on public health in the

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curriculum, the faculty has devoted significant manpower and resources to the development of the Division of Health in the Community. This effort served not only to attract high-caliber people to join us, but also stimulated some of the local faculty to take interest and do further training in the area of public health. Thus, we encouraged and helped 10 faculty members (including 6 physicians) to obtain the MPH (Master of Public Health) degree, and 2 to obtain PhD degrees in health administration. This training effort for public health in a medical school faculty is unprecedented in Israel and in most schools throughout the world.

Residency training has become more academic, as in most university teaching hospitals. In addition, a special effort has been made to improve the quality and to expand the number of family practice residents. A National Center for Family Practice Residency was established at the UCHSS. This center coordinates and overviews the academic activities of family practice residents in Beer Sheva, Afula and Haifa (constituting about 40% of the residents in the country), and has promoted and improved the quality of the teachers in family practice in both the Negev and the north of Israel. Ninety-one residents are now in training (32 in the Negev), and there are already 37 specialists in family practice who graduated from this program (12 in the Negev). This is a major contribution to the quality of primary care in the Negev as well as to the country as a whole. Additional manpower training activities directed at other community health professionals include special courses for primary clinic administrators, medical secretaries, pharmacists and dentists.

COMMUNITY MEDICINE AS AN ACADEMIC DISCIPLINE

Most traditional medical schools pay only lip service to public health and community medicine by having a small department and few resources for its programs. The UCHSS from the outset has emphasized its intention and commitment with regard to public health by creating the following units: 1) Epidemiology and Health Services Evaluation, 2) Sociology of Health, 3) Administration and Health Economics, and 4) Primary Care, which, together with the Occupational Health Unit were integrated into the Division of Health in the Community. This Division promotes academic activities in the primary care system in the same manner as done by the clinical divisions in the hospital, or by the Basic Sciences Division in its research laboratories. There are 67 faculty members with academic appointments in this division (out of 380 faculty, including clinicians) and half of these are family practitioners. The number of

physicians with faculty appointments far exceeds the total number of academic appointments in family medicine in the other three medical schools in Israel combined. The 33 faculty members in family practice include 8 in the north of the country. Thus, it is obvious that we have been a major driving force in the academization of community medicine and, more specifically, family medicine. This academization adds prestige and increases the attractiveness of a career in family medicine and public health; we hope to see more good people attracted to this field, which has long been neglected in Israel. By doing so, the UCHSS contributes to the improvement of the quality of community medicine.

ORGANIZATIONAL CHANGES

The concept of a medical center being responsible for health care for a total area of the country has been the foundation of the UCHSS philosophy. Most medical schools adopt one or two small communities that are usually used for demonstration projects or for teaching community medicine. No other center has taken upon itself the type of responsibility and commitment that the UCHSS has. The Dean, being the Director of Health Services in the Negev, has the obligation to deal with the problems of the services on a routine basis. Thus, the academic problems of teaching and research become intertwined with service issues. Manpower and financial resources from academic and health services serve to strengthen each other and support programs that otherwise could not be executed. This responsibility is shared by the heads of the divisions; e.g., the head of pediatrics is not merely in charge of the hospital pediatric wards but is responsible for the total child health services in the Negev, which include Maternal and Child Health clinics, primary pediatrics, and the various consultative pediatric services. He allocates pediatricians to work in the various hospital wards, in the community primary pediatric clinics or in a combination of both—a model that is becoming more and more prevalent. The same pattern prevails in obstetrics and gynecology, ophthalmology, otolaryngology and, to a much lesser extent, in internal medicine (due to a severe shortage of internal medicine residents). Thus, without a formal organizational merging between the hospital and the community health system, there has been a *de facto* merging in many of the medical disciplines. This has brought us closer to one of the most important goals of the UCHSS, namely, the merging of hospital and community health care systems.

However, this is not enough, and the complete administrative merging of the two systems under one authority, which will include nursing, laboratory

services and all other auxiliary facilities (single manpower organization, financial unification, etc.) is yet to come. This is our most significant shortcoming and the most important goal for the next decade.

One goal toward which we have made absolutely no progress is the merging of preventive and curative services. The political implications of this union were such that it was impractical to have expected it to happen during the past decade. However, recently the Ministry of Health has clearly stated its commitment to make significant progress in the merging of preventive and curative services under one roof, i.e., to give the resources and responsibility for both to Kupat Holim. There is already a preliminary plan in which the Negev will be the natural experimental area for this merger; thus, there is hope for change in the next decade.

CHANGES IN PRIMARY CARE PRACTICE

The most significant contribution of the UCHSS in the first decade of the health services in the Negev, apart from its profound beneficial effects on the teaching hospital, is certainly the revolution in primary care. There are several papers in this issue that describe in detail the various components of change that have taken place, but it is important to stress the total effect of these components. The fact that the goal of the UCHSS was clearly defined as the improvement of the quality of primary care, and that a significant proportion of the teaching takes place in primary care settings, made that commitment very visible. Teaching in primary care clinics had to be created, and teachers had to be trained. A massive effort of time and resources (namely, the *Aguda* project, funded by the Joint Distribution Committee) was directed to changing no less than 13 primary clinics in the Negev into teaching centers, with various organizational and functional modalities that serve as learning experiments to students, residents and the Kupat Holim administration. These clinics, in which the process of care has improved drastically, are bound to have a beneficial effect on the quality of care and, thus, also on the quality of health of the third of the Negev population that is served by these teaching clinics. The graduates have become important change agents in this exciting process. They have helped create modalities in which there is utilization of nurses in triage, and where social workers, medical secretaries and other health professionals are working together as a team (sometimes for the first time) in primary care. The family residents are now taking over and adding their expertise and have become a permanent feature in this thrust to improve primary care. In the next decade, the goal should be to expand the improved

care to the whole primary health system in the Negev. The outreach programs, such as *Community Health Activists* that has spread from Netivot to Yerucham, Arad, Dimona and Beer Sheva, the oral rehydration program in the Bedouin town of Rahat, and the rehabilitation program of the handicapped in Yerucham, are all additional and very exciting developments in the direction of the broader community involvement of the health providers of the Negev.

CONCLUSIONS

This paper was limited to a review of the changes that occurred in the organization of health services in the Negev and to the changes in the process of primary care delivery. The evaluation of outcome indices is a broad and complex issue that is being tackled systematically by the Unit of Epidemiology and Health Services Evaluation of the faculty. Issues such as the efficiency of hypertension control in the community, drug utilization in primary care, trends in referrals to the hospital's emergency ward, and hospitalization patterns are being examined, as well as the cost-efficiency estimates of the various experimental models of primary care. These important issues will be described and published in the years to come, since most of them demand long follow-up.

The answer to the question posed as the title of this paper is definitely "yes!" In one decade very significant strides have been made in the area of manpower development, and training not only community-oriented physicians and nurses, but also public health personnel who support and continue to promote the community orientation of the UCHSS. The faculty's role in community medicine and family practice has served to improve the levels of teaching and performance. There are signs that research activity is starting to develop as a natural sequence of this academization. This too is a feature that provides assurance for the ongoing process of improvement in the quality of primary care.

Organizational changes have enabled the merging of hospital and community in various medical disciplines. A formal organizational merging of the two systems must come soon in order to consolidate the achievements obtained so far and to continue to progress and improve. Kupat Holim will soon have to decide on several new organizational patterns for primary health clinics. The present ones are a source of considerable dissatisfaction to both providers and consumers. These new modalities will have to satisfy the academic standards of a university level of primary care, as well as the need to merge preventive and curative services. The experience gained in the Negev should prove very valuable when these decisions are made early in the next decade.

THE BEER SHEVA EXPERIMENT—PAST, PRESENT AND FUTURE

The Hospital Management Viewpoint

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In 1972 when the "Beer Sheva Experiment" became a reality, Dr. Moshe Prywes defined the goals of the University Center for Health Sciences and Services (UCHSS): "It will respond to a double challenge: to combine all health services in the region into one integrated system in order to provide comprehensive medical care for the regional population; and to merge this system with the system of medical education in trying to educate physicians who are aware of the needs of the community and wish to work in both community hospitals and primary care clinics" (1).

The concept can be summarized as a comprehensive medical system composed of integrated primary, secondary and tertiary medical care and community-oriented education—one academic medical center with integration of medical care and health services for one geographical region, the Negev.

GEOGRAPHICAL AND DEMOGRAPHICAL CHARACTERISTICS

The Soroka Medical Center is a regional hospital whose catchment area includes half of the geographical area of the state of Israel—the Negev—and about 7.5% of the country's population. The hospital is located in the northern part of the Negev. To reach the hospital, patients have to travel varying distances, from 1 to 5 km within the town of Beer Sheva, and 10 to 50 km from most regional settlements—up to 220 km from the southern part of the Negev. The total Negev population of approximately 300,000 comprises four main groups: 1) the urban population (110,000) that resides in the city of

Beer Sheva itself; 2) the 55,000 Bedouin population, many of whom still live in tents and huts, but increasingly in permanent houses (some of the Bedouins still partially use traditional tribal care, with a dervish); 3) army populations that are in a relatively self-contained system dispersed all over the region of around 10,000 km²; and 4) residents outside the urban area of Beer Sheva.

BEFORE 1973

The existing conditions for establishing the Beer Sheva Experiment were: 1) a population of 235,000 in one large developing region; 2) one general community hospital with 585 beds and a good nonacademic nursing school owned and operated by Kupat Holim (Health Insurance Institution of the General Federation of Labor); 3) 134 primary care clinics, part of the Kupat Holim network, but with little connection to the hospital; and 4) a young university without a medical school.

Those who had the dream defined two other conditions (1). The first was the desire of the medical staff of all the medical organizations in the region to have a well-integrated framework. Later on, however, this wish was not accepted by all medical sectors, but only by a small group who wanted an academic affiliation. Many others remained indifferent to the changes. And the second was the trend of the Ministry of Health to integrate and to unify its activities with those of Kupat Holim. This goal was not accomplished, however, and remained theoretical. The two main problems of the medical services were: 1) the difficulty of recruiting skilled medical manpower, especially physicians, for both the hospital and the community; and 2) difficulties in manpower development.

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Despite the policy that attempted to offer the Negev medical services as good as those in the center of the country, the level of medical services in the Negev remained inferior to those in the more developed areas of Israel. The underdevelopment and less attractive nature of the Negev, compared with the center of the country, made the problem of recruiting "high-tech" personnel more difficult.

The main message of the Experiment to the physicians was "join us and see the academic world," i.e., academic positions and academic privileges. This message did not affect the rest of the staff.

FIRST DOZEN YEARS (1973-85)

According to the original concept, the Medical Center was founded through the union of the hospital and the Faculty of Health Sciences on the same campus, where the Dean of the faculty is also the head of all the regional medical services. During the last 12 years, the following main changes have been accomplished:

- 1) The University Center for Health Sciences and Services was established, comprising a medical school and a school for community health professions.
- 2) The traditional Nursing School was changed from a local nonacademic nursing school, belonging to and serving the hospital, to an academic, independent school for community health professions comprising nursing and physiotherapy tracks.
- 3) The community hospital became a teaching medical center.
- 4) The medical center became the center of all the medical services in the region; the involvement of the hospital in the community was thus broadened and deepened.
- 5) The Ministry of Health established a psychiatric hospital of 170 beds, with an academic affiliation to the medical school, but totally independent in all other ways. In addition, a department of psychiatry was opened at the Soroka Medical Center.
- 6) Other medical services, such as Magen David

Adom (the Israeli equivalent of the Red Cross), declined to be absorbed into the Medical Center; they preferred to remain independent and tried to open their own medical rescue center.

The quantitative changes during the last 12 years are summarized in Table 1. It can be seen that in spite of a 29% growth in the population and its rising age, the number of beds in the hospital increased by 20% only; the total number of hospitalization days increased by 19% and the bed occupancy from 95 to 101%; thus the hospitalization system became more efficient. The reduction in hospitalization days per year from 872 days/1,000 population in 1974 to 824/1,000 in 1984 (5.5% reduction) supports the assumption that the hospital became more efficient.

Organizational changes in the hospital resulting from the Beer Sheva Experiment

The idea was stated in the principles of the Beer Sheva Experiment (2) as follows: "Regionalization of services, strengthening of primary care clinics and community medicine, limitation of hospitalization and changing the inner structure of hospitals, and reform of medical education by increasing its relevance to the health needs of the population." Most of these goals have been fulfilled. The services have been regionalized in full for pediatrics, gynecology and internal medicine, i.e., the responsibility of the chairman of a department includes total care of the population—primary, secondary and tertiary care; and partially regionalized for the other disciplines.

Primary care was strengthened by "integrative" positions in internal medicine, surgery and pediatrics, whereby board-certified physicians divided their time between the hospital and the community. The family physician residency program contributed its share to strengthening the primary care system. The inner structure of the hospital was changed as follows: 1) In addition to the traditional medical wards, five clinical divisions have been established: internal medicine and allied disciplines (i.e., neurology, nephrology, gastroenterology, cardiology, geri-

Table 1. Demographic changes in the Negev between 1974 and 1984 and their reflection on hospitalization (excluding geriatrics)

	1974	1984	% change
Total population	235,000	296,000	26.0
Bedouins	37,000	55,000	48.6
Total hospital days	204,973	243,783 (253,115 ^a)	19(23 ^a)
Annual hospital days/1,000 population	872	824 (855 ^a)	-5.5
Visits in outpatient clinics	146,453	256,706	75.3
Total no. of beds	585	704	20.3
Day care beds	—	47	—
Occupancy (%)	95	101	6.3
Average duration of hospitalization (days)	6.3	5.9	-6.3

^aTotal hospitalization including day care.

Table 2. Manpower development in the Soroka Medical Center and the community between 1973 and 1984

	Hospital			Community		
	1973	1984	% Change	1973	1984	% Change
Physicians (no.)	133	313 + 39 ^a	135 (165 ^a)	119	208	75
Nurses (Total no.)	401	656	65	199	300	51
RN (%)	34	33	—	30	38	—
Practical nurses (%)	54	45	—	69	62	—
Nursing aides (%)	12	22	—	1	0	—
Nurse:physician ratio	3.01	2.10	—	1.67	1.44	—
RN:physician ratio	1.02	0.71	—	0.50	0.55	—
Primary care clinics (no.)	—	—	—	134	119	—
Monthly consultative sessions ^b (no.)	—	—	—	40	269	573

^a Physicians in faculty teaching position.^b The consultative sessions of secondary care are given by the hospital physicians in the community clinics. RN = registered nurse.

atric medicine, oncology, etc.); pediatrics; obstetrics and gynecology; surgery (general surgery, ophthalmology, ear, nose and throat, urology, orthopedic surgery, neurosurgery and plastic surgery); and psychiatry. Other divisions are in the planning or implementation process. 2) Tenure in clinical specialties is now granted only for entry into positions that involve duties both in the hospital and the clinics. 3) A pediatric ward of 25 beds was transformed into a day care unit (8 beds) next to the pediatric emergency room. As a result, the occupancy in the other two pediatric wards decreased by about 10%, and the overall hospitalization days in the pediatric division were reduced by 35%. Similar changes in the other divisions are being planned.

Present advantage to the hospital

The hospital benefits to a certain extent from the Beer Sheva Experiment. By the creation of a teaching hospital, the whole area has become far more appealing, from a professional point of view, resulting in an increase of 135% in physicians in the hospital and 75% in the community (Table 2). There are adequate numbers of good candidates in most fields

of medicine so that the management is able to choose the best for residency.

The resident who completes his or her training in the hospital is drawn into community medicine and is employed part-time by the hospital (about 3 days a week) and part-time by the clinics in the community; therefore, the hospital can continue to absorb new young residents without discharging from the system those who completed their residency. Thus, the recommendation of the WHO's Executive Board and the World Health Assembly to link health services and manpower deployment is realized (3). As a result, the primary care clinics in the community receive highly trained doctors who by their ongoing affiliation with the hospital, form a continuation of care between the community and the hospital and raise the standards of medical practice. These developments improve the diagnostic and therapeutic process and reduce unnecessary hospitalization. The follow-up of patients is longitudinal and not limited to the hospital.

The annual number of hospitalization days per year in the Negev is 824/1,000 population, excluding psychiatry and geriatrics, and is lower than the national average of 943/1,000 (Table 3). (Unfortunately, age-adjusted rates are unavailable; however, the exclusion of the geriatric patients makes this comparison acceptable). The same lower rates are valid in almost every department of the hospital. These low rates suggest that the Beer Sheva integrated medical system is the most effective in Israel.

Goals not yet achieved

In spite of the significant achievements made during the past 12 years, according to the original goals (1, 2, 4, 5), not all objectives have been attained.

Integration of all health services in the Negev. Preventive medicine and psychiatry services are still divided between Kupat Holim and the Ministry of

Table 3. 1984 hospitalization rate by discipline: comparison of Negev region and national rates^a

Hospitalization rate	Negev	Israel	% difference
Total ^b (excluding geriatrics and psychiatry)(5.9)	824	943 (5.8)	14
Internal medicine ^b	171 (6.0)	228 (6.5)	33
General surgery ^b	107 (6.9)	126 (5.9)	18
Pediatrics ^c	211 (6.2)	280 (4.9)	33

^a The average hospitalization duration in days appears in parenthesis.^b In days/1,000 persons per year.^c In days/1,000 children per year.

Health. A major concern of the hospital is the separation of rescue services, a fact which impedes the activity of intensive care mobile units and that of the cardio-mobile ambulance in providing proper continuity of treatment from the scene of the event to the intensive coronary care unit.

Furthermore, night-service emergency clinics are still separated from the hospital and from the ambulatory care clinics, resulting in two separate systems—one, the emergency rooms of the hospital and the other, Magen David Adom. This dual system consumes essential financial resources and reduces optimal treatment.

Merger of hospital and community services. The merger between the hospital and the auxiliary community services, which include nursing, physiotherapy, occupational therapy, and social work as well as laboratory services, are indispensable for continuous optimal medical treatment.

Full merger of health services with medical education. This goal has almost been realized, since all medical departments are affiliated to the Ben-Gurion University of the Negev. However, not all our clinical teachers are adequate role models with regard to integration in the community.

Disadvantage of the Beer Sheva Experiment The main disadvantage of the Experiment is in the nursing sector, both in the hospital and in the community. An integrated medical service needs more nursing manpower than does a traditional one. Teamwork in the community needs highly qualified nurses, namely registered nurses with special training. This type of work is more attractive to most nurses and, therefore, many registered nurses leave the hospital for work in the community. In fact, during the years 1973 to 1984 the percentage of registered nurses in the hospital dropped from 34% in 1973 to 33% in 1984, but increased from 30 to 38% in the community. In the same period the percentage of nursing aides in the hospital almost doubled (from 12 to 21%), but remained 0 to 1% in the community. The overall nurse:physician ratio decreased seriously in the hospital but not in the community. Furthermore, the reduction in the ratio of registered nurses to physicians in the hospital is even more marked (Table 2).

The transformation of the previous nursing school to an academic one with community medicine attitudes shifted the equilibrium toward the community with little compensation to the hospital. Today, the hospital receives fewer graduate nurses from its own school than in the past. Most nursing school students are moving outside the hospital and even to other regions, since the school is independent

and has no obligation to the hospital—in spite of the fact that the hospital offers almost all of its facilities including teaching infrastructure to the nursing school.

A LOOK TO THE FUTURE

From the point of view of the hospital, the following should be planned and implemented: 1) As a result of the inconvenience of the large distances between the settlements and the hospital (up to 200 km) and the need to retain the structure of one region, one medical school, and one medical center, it is suggested that the organization establish satellites of the medical center, each satellite providing pediatric day care (rehydration center), high-risk pregnancy day care, general day care and "secondary" care medicine (regular consulting services, like ear, nose, and throat, ophthalmology and others). These satellites will be operated for the community by the hospital. 2) Operational autonomy of the Negev health services: This service should be governed by a regional health council in which the Dean of the UCHSS will be the chairman of the council. The council should define the comprehensive regional medical policy, manage an independent medical budget, and hire or buy necessary medical services from outside the region. 3) Special attention should be paid to solving of the shortage of nursing manpower; it should be solved by the regional council as a regional solution (i.e., regional nursing schools, regional scholarships, special nursing educational programs for housekeepers, housing solutions, special financial aids, etc.).

Large organizations have a great deal of inertia. Only with the investment of significant energy in the organization can the necessary changes be produced. Such a process was created in 1973 by the establishment of the Ben-Gurion medical school. Further development can be stimulated by another major structural change, such as regional medical autonomy.

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DIVISION OF HEALTH IN THE COMMUNITY: DEVELOPMENT, STRUCTURE AND FUNCTION

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The founding Dean of the University Center for Health Sciences and Services, Dr. Moshe Prywes, initially established neither a department of general practice nor a department of primary care, nor even a department of community or family medicine; he maintained that primary care was to become everyone's business. Therefore, the hospital chiefs of service would be responsible for community as well as hospital services. The head of the Pediatrics Department would be responsible for the health of all Negev children, and the head of Internal Medicine would be responsible for the health of Negev adults. This strategy succeeded in motivating the heads of the hospital departments to plan community care. However, by 1977 it became apparent that several forces were pressing for the establishment of an academic locus for primary care within the medical school. First, the department heads were grappling with many difficult hospital problems and had neither the time nor the administrative support to make major changes in community health services. Second, the few outstanding primary care practitioners who had been chosen to initiate primary care teaching and change community services perceived a need for a power base outside the hospital that could both balance the hospital power base and work to effect these changes. Third, since the organizational structure of the Kupat Holim (Health Insurance Institution of the General Feder-

ation of Labor) continued to emphasize the separation of hospital and community clinics, only an academic unit located near the district clinic offices would be appropriate for effecting changes. These were the main factors that brought the Primary Care Unit (PCU) into being in September 1977.

The PCU was to assume responsibility for all primary care teaching at all clinical levels, from preclinical (including all early clinical teaching programs during 1977-79), through clerkship and residency teaching, including continuing medical education for practicing physicians. However, within a year of the founding of the PCU, as we attempted to prepare the community clinics for their first clerkship students, it became apparent that a unit whose responsibility extended to clinical teaching alone would not have sufficient power either to create a strong enough primary care curriculum or to effect change in the clinics. Moreover, from the perspective of research, it was felt that only close coordination of all the units involved with the community could lead both to relevant studies on health and disease in the community and to research performed by practitioners. At a meeting of the primary care and community medicine faculty, 19 central primary care problems were defined (Table 1). In July 1979, the Division of Health in the Community (DHC) was formed in order to achieve these teaching, service and research goals.

DHC BYLAWS

Bylaws were proposed by the DHC and ratified by the General Council of the University Center for

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Table 1. *List of problems (by priority) of the Planning Committee of the Division of Health in the Community (DHC), 9 September 1978*

1. Quality of care evaluation of primary and preventive services, including setting standards and evaluating community needs
2. Attracting primary care staff
3. Writing DHC bylaws
4. Coordinating X-ray and laboratory services with community needs
5. Defining primary care clinic models
6. Establishing continuous, comprehensive primary care, including developing night and holiday primary care services
7. Unifying health services (hospital-community, curative-preventive)
8. Establishing a quality primary care medical record
9. Developing ambulatory and primary services as alternatives to hospital (second and tertiary) ones
10. Motivating clinic staff to do research
11. Establishing an effective health education program
12. Designing effective continuing education courses for clinic staff
13. Establishing priorities for developing quality clinics for service and teaching
14. Encouraging effective community representation in the health services
15. Coordinating medical and nursing functions in the community clinic
16. Providing sufficient specialty consultation
17. Improving community mental and dental health services
18. Planning health services for the Bedouin population, including a plan for follow-up of discharged Bedouin children (by request of the Division of Pediatrics)
19. Decreasing unnecessary surgical referrals to the Emergency Room (by request of the Division of Surgery)

Health Sciences and Services to govern situations involving the DHC's overlapping functions in the hospital and the community, its relationship to other clinical divisions, and the relationship between its academic and clinical units (see below). The main reasons for establishing the DHC were a common interest of member units in community health services and in research performed in the community, and a strong interest in merging clinical and primary care—including family medicine—with teaching in epidemiology, sociology of health, medical economics, medical care administration and occupational health. The DHC had four tasks: 1) to help plan and coordinate community health services, community-based teaching and community research—including running several model services, planning, implementing and evaluating primary care clinical and community medicine teaching, and coordinating and supervising community-based research; 2) to define, together with community representatives, community health problems, and to plan and implement programs for solving them; 3) to develop connections between hospital and community services in service, teaching and research; and 4) to establish connections with community health institutions, as well as community welfare teaching and research institutions in Israel and abroad.

DEPARTMENTAL STRUCTURE

Fig. 1 shows the organization of the DHC. While each unit retains independence in internal budgetary and personnel management and research, the Division Council, which includes key health service figures and a representative from each major clinical service, coordinates interunit programs in service, teaching and research. The council meets every 4 to 6 weeks, and the unit heads meet every 2 to 3 weeks. Both groups are chaired by the head of the department, who is responsible for managing the DHC budget, for developing accommodations for the Division, and for recommending academic appointments. This departmental structure brings together groups of specialists who usually work in separate departments: primary care clinicians work with community medicine, public health and behavioral science specialists, and with primary care clinicians from different specialties.

DEPARTMENTAL PROGRAMS

Service

The central goal of the DHC is to upgrade a group of Kupat Holim community clinics to provide high quality primary care. This process began with defining community health problems even before the DHC was established (see Table 1) and continued with intensive efforts in three major areas: developing quality community clinics, establishing the Bedouin Mobile Care Unit and related projects, and establishing quality residency training in family medicine and in community pediatrics and internal medicine.

The Clinic Development Committee was established in September 1979 in order to coordinate planning and implementation of changes in community clinics (1). At the same time, significant funding was obtained from the World Joint Distribution Committee (JDC) through the Israel JDC for the specific purpose of advancing health and social services in the Negev. The first 2 years of this 5-year project, known as Phase I, were spent developing one urban clinic (Massada clinic in Beer Sheva) and one development town clinic (Ofakim clinic)—models of quality community medical care (2). The limited success of Phase I was due to local difficulties with program management, communication problems between Beer Sheva and the Israel JDC in Jerusalem, and lack of an effective mechanism for allowing project personnel to function within Kupat Holim. During the following 3 years, known as Phase II, the program was expanded to include the *Graduates Program* for primary care, which constitutes a major DHC effort and is described in detail in several other papers in this

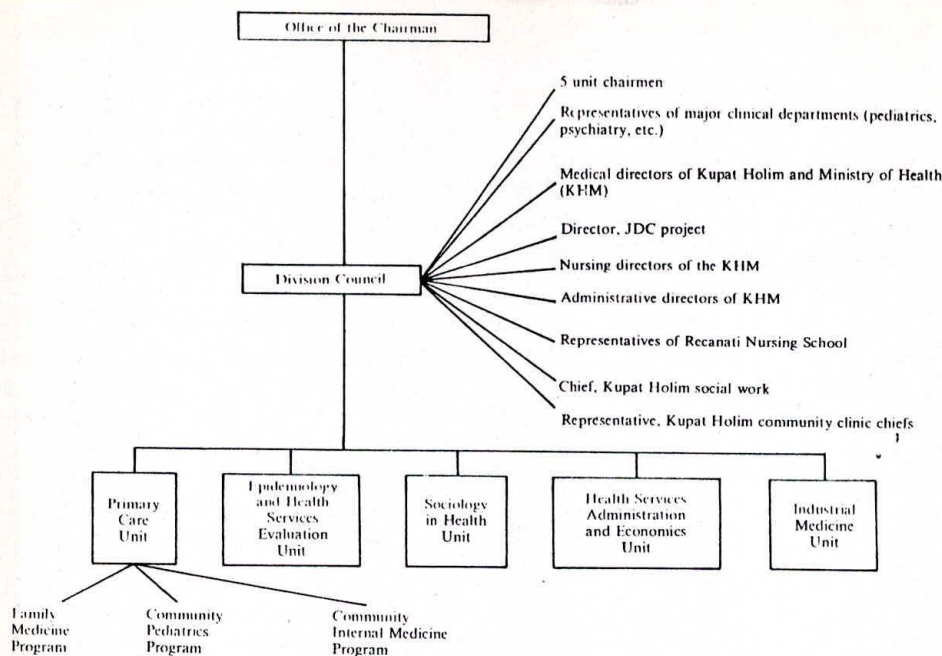


Fig. 1. Structure of the Division of Health in the Community. Kupat Holim = Health Insurance Institution of the General Federation of Labor; JDC = Joint Distribution Committee; JDC project = Association for Advancement of Medical and Social Services in the Negev.

issue. During the first 3 years of this process, the Clinic Development Committee met over 40 times to plan and review the progress of these projects. Phase II is seen as a success by participants, by Kupat Holim and faculty managers, and by the communities that have benefited from improved individual patient and family care (3).

In May 1984, the Israel JDC Negev project continued past its original 5-year mandate into the unanticipated Phase III (4), which aims to support the development of specific community projects, and is also described elsewhere in this issue.

In August 1985, the DHC was defined as having responsibility over the quality of care in 13 teaching clinics, 5 in Beer Sheva, and 8 in development towns—Nehora, Sederot, Netivot, Ofakim, Rahat, Arad, Dimona, and Yerucham. This definition was not meant to permanently exclude other clinics from joining the DHC. Rather, it is felt that these 13 clinics are now functioning generally at a relatively high level of care. Other clinics that will reach this level will subsequently be candidates for inclusion in the DHC.

Another major DHC project is the Bedouin Mobile Care Unit that provides outreach services to the Bedouin population. Initially funded privately with running expenses provided by Kupat Holim, the Unit provides follow-up services for children and adults living in the desert. For example, the staff will

regularly visit a child with a failure to thrive, in order to help with feeding and to check its weight, or will enable an adult burn patient to return to his tent earlier by providing frequent dressing changes. Arabic-speaking staff includes a Bedouin community worker-driver, an experienced registered nurse with special training in public health, and a community nutritionist. The nutritionist, a locally trained paramedic, started the second Unit service: pre-discharge nutritional counseling for Bedouin mothers in the pediatric ward. A third service provides nutritional and nursing counseling to new mothers in the obstetric ward. During the past year, staff have begun to strengthen the interaction between the Kupat Holim community Bedouin clinics and the hospital, as well as the connection between community clinics' staff and their patients at home.

Teaching

The major teaching effort was initially invested in the community-oriented primary care clerkship (5). However, with the establishment in August 1979 of the Kupat Holim Ben-Gurion University National Institute for Residency Training in primary care and family medicine (NIRT), and the concomitant designation by Kupat Holim of 175 salaries for family medicine residency training, strong emphasis was placed on developing postgraduate primary care

programs. To significantly upgrade the quality of the family medicine residency, the following steps were taken: 1) Admissions policy and procedures were made explicit and standardized. 2) A required day-release course in family and community medicine was designed, implemented and evaluated. This course was taught for a 7-hour day/week, 9 months/year over 3 years, and included units in communication skills, Balint-type group work, counseling for common psychosocial problems, epidemiology, medical sociology and other critical areas in which the residents had little or no training. The course was accredited as compulsory in 1981 by the Scientific Council of the Israel Medical Association. Within a year, the same course held at the northern branch of the NIRT in Haifa and Afula was also accredited, followed by the accreditation of similar courses in Jerusalem and Tel Aviv, and thus a major change was effected in the family medicine residency training in Israel. Recently, emphasis has been placed on designing an appropriate evaluation of resident performance, insuring structural standards for family medicine training clinics, and improving the quality of supervision by tutors.

Two other innovative continuing medical education courses are the continuing medical education course for medical school graduates participating in the *Graduates Program* described elsewhere in this issue and the clinical scholar program. This newest DHC teaching program is designed to provide promising new specialists in family medicine, pediatrics or internal medicine with a year's training in general academic medicine. The program, which started in February 1985, with a family practitioner scholar, is made up of three units. The scholar 1) provides supervised weekly consultation to medical graduates practicing in two community clinics; 2) takes 1- to 4-month tutorials in clinical epidemiology, medical sociology, medical care administration and medical education; and 3) completes a supervised independent research project.

A program in community pediatrics for pediatric residents is being planned jointly with the Division of Pediatrics. The program will include course work similar to that taught to family medicine residents and pediatric community clinic case presentations. Full implementation of this program will occur only after the new, nationally required community pediatrics curriculum is implemented. Although Dr. R. Boehm did pioneering work in developing a community internal medicine clinic in Yerucham that was integrated into the Division of Internal Medicine at the Medical Center, this model has not yet spread to other clinics, and the beginnings of a pro-

gram in primary care internal medicine are only barely visible today.

Teaching programs in the basic sciences of community medicine and primary care—epidemiology, health services research, behavioral and social sciences—are described elsewhere in this issue.

Research

Bringing together the units of the DHC has led to increased coordination of their research efforts. Thus, the evaluation of the Israel JDC project was performed by members of the Epidemiology-Health Services Evaluation, Primary Care and Medical Administration Units. The Epidemiology Unit also helped members of the PCU and Medical Sociology Unit in major research on health, disease and culture in the Bedouin population. The Medical Sociology Unit is now spearheading major collaborative geriatrics research. At the same time, preserving the independence of member units has allowed each to develop its own research themes. The Medical Sociology Unit has concentrated on stress research. The Health Services Administration Unit has emphasized research on the cost-effectiveness of the medical staff and medical economics. The Epidemiology Unit has completed studies on local diseases such as viral hepatitis, and the PCU has explored research in clinical education, including studies on medical decision making and medical record audit.

Two enduring DHC forums for presenting research have been established: at the research colloquium, investigators present research planned or in progress to a critical audience; at the monthly research meeting, visiting or resident researchers present completed work in detail. Recently, renewed effort is being invested in a research activity that was initiated by the PCU and Epidemiology Units in 1977, and which solicits and supports practitioner research. To this end, a community research meeting for community practitioners was begun a few months ago. In summary, when compared with any of the other medical school divisions, the DHC has accomplished a large amount of quality research, as measured by the number of published papers or by research dollars earned.

DISCUSSION

Many of the achievements, described above, in upgrading Kupat Holim clinics are now being repeated in other clinics, but all too frequently some of the original achievements have at the same time been eroded. Thus, finding a permanent home in the Kupat Holim services for the Bedouin Mobile Care unit that functions in and out of the hospital has grated sharply against the rigid definitions that

require a Kupat Holim unit to be either hospital or clinic based. Our effort to implement a community problem-oriented record has collided repeatedly with an attempt to institutionalize nationally a less costly, inadequate, abbreviated, problem-oriented record. Decisions on the organization of a development town clinic may be taken out of local team hands because of ostensibly more important considerations appreciated only by central administrators in Tel Aviv. At the same time, it is well known that highly competent physicians must function professionally with a large amount of independence if they are to pursue fulfilling careers not only as hospital chiefs of services but as clinic directors or practitioners. Can Kupat Holim decentralize? Can community Kupat Holim clinics gain professional and even economic independence so that physicians are challenged to work in them? These questions define limitations to the goal of upgrading the clinics. We do not yet know if these limitations are surmountable.

If in the teaching and research game the outlook is brighter, this is because we have made the rules for playing on our home court. Yet, limitations do exist. We have not yet attracted or trained a sufficient number of quality teachers to allow for development of programs in depth. Beer Sheva is for many only an empty desert, rather than a challengingly empty desert. Even for those who see the challenge, if one is the only specialist in an area, there is no room in all that emptiness for a discussion among colleagues. Built-in mechanisms for change may themselves constitute a limitation. Changes that are too rapid in unsettled but fundamentally sound programs for teaching family dynamics and clinical judgment to students, and for teaching the medical graduates and

family medicine residency course, have sometimes wasted effort and achievements already gained. National inertia has seriously hampered local development of important programs. Development of both pediatric and internal medicine primary care will have to await national support in the form of required residency tracks and speciality examination requirements. This last limitation, however, may be legitimate albeit extremely frustrating. Our medical social forces are only a microcosmic model of larger Israeli social forces. Thus, like the individual kibbutznik, an Israeli medical school may not be able to proceed with a plan that does not have general support. On the other hand, even in a socialist society, much progress may be made by means of small, rather than large groups, that allow individual expression within a framework. In Israel, the kibbutz seems to function effectively as an independent unit. In the hospital, a ward seems to warrant independence. Outside the hospital, it is essential that recognition be given to the community clinic as the appropriate independent organizational unit.

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ADMINISTRATION OF THE BEN-GURION UNIVERSITY CENTER FOR HEALTH SCIENCES AND SERVICES

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Before leaving the World Health Organization to join the staff of the Ben-Gurion University, which was to establish the Center for Health Sciences and Services, Prof. Newell, an epidemiologist of international renown and a scholar in the field of health services administration, explained the reasons for WHO's enthusiastic support of the ideas underlying what was later termed "The Beer Sheva Experience." "We shall support you," he said, "because your project is not based on a piecemeal approach towards change and development. What you intend to do may constitute a revolution in the field of health care and medical education which could have a vital impact on progress of medicine, not only in Israel, but all over the world."

This conversation worried me, because I was aware of the difficulty often encountered in the actualization of great ideas in the reality of large organizations with bureaucratic restraints. I was reminded of this problem again by the late Mr. Y. Palgi, who in 1973 held the position of Chief of Personnel in Kupat Holim (Health Insurance Institution of the General Federation of Labor). He warned me presciently: "Kupat Holim has been in existence for more than 50 years and is very set in its ways. It is extremely difficult to introduce changes, and especially if they are proposed by, and require collaboration with, outside organizations." Over the years, I had to remember this warning time and again.

For implementing any program, four vital components are required: The underlying ideas and concepts, the people to execute them, the necessary financial resources, and the requisite administrative

structure. These components are of course interrelated, and the insufficiency of any one of them will endanger the proper utilization of the others. Novel and challenging ideas often attract outstanding staff; however, the best employees will not be able to function without financial resources, and both personnel and funds will be wasted unless supported by a suitable administrative framework.

I shall describe and evaluate the administrative structure that was designed to implement the ideas underlying the Beer Sheva Experiment. Evaluation, of course, also involves an analysis of the progress made toward the realization of the aim of the program.

THE HEALTH INSTITUTIONS OF THE NEGEV

The basic concept was to create a comprehensive regional health services delivery system, which would be composed of the existing health service institutions and the University Center for Health Sciences and Services, to be established within the Ben-Gurion University of the Negev. This system was to comprise all organizations providing primary, secondary and tertiary health care, as well as those in charge of public health and preventive medicine.

In 1973, the following institutions existed in the Negev: 1) The Soroka Medical Center, a Kupat Holim general hospital of about 650 beds situated in Beer Sheva, led by a medical director and an administrative director. 2) The regional primary health services organization of Kupat Holim, led by a medical director and an administrative director, which was responsible for all community clinics in the Negev, both in towns and rural settlements. Both these organizations reported directly and separately to Kupat Holim Headquarters in Tel Aviv.

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3) Josephthal Medical Center in Eilat, a 150-bed general Kupat Holim hospital, led by a medical director. It was not included in the Negev District of Kupat Holim, but related directly to Tel Aviv.

4) The Regional Organization of the Ministry of Health headed by a medical director who reported directly to the head office in Jerusalem. It fulfilled all public health functions and was responsible for the network of Maternal and Child Health clinics and of a mental health clinic.

In 1977 the Mental Health Center, a government psychiatric hospital, was opened in Beer Sheva. It was headed by a medical director and an administrative director who reported directly to the Ministry of Health in Jerusalem. The existing mental health clinic was incorporated into the center.

There were additional institutions which had never been officially included: firstly, the Barzilai Medical Center, a general hospital in Ashkelon, and secondly, the various other health insurance institutions existing in the Negev. As for the Barzilai Medical Center, there has from time to time been pressure by the Ministry of Health to include it officially within the University Center. So far, no official steps have been taken in this direction. However, over the years, groups of medical students have done part of their clinical training there, mainly in pediatrics and psychiatry. Inclusion of the smaller health insurance institutions, which have a relatively limited membership in the Negev, has, to my knowledge, never been seriously considered.

There existed, therefore, a tripartite pattern. Two sectors, Kupat Holim and the Ministry of Health, had been in existence for many years. They had developed a tradition of mutual distrust and even animosity on the national level, though probably less so in the Negev. The University Center for Health Sciences and Services, which was created in 1973, had no such tradition, and since it was established under the banner of integration with the health services (the slogan of Moshe Prywes was: "Whoever teaches should serve and whoever serves should teach"), it can be said to have always been a centrifugal force.

In fact, the pattern was even more complex. Kupat Holim in the Negev has never been a monolithic body. The hospital and the primary health network constituted two quite independent entities which, although cooperating in the professional field, had completely separate budgets, administrative structures and staffing.

To bring about a measure of coordination and cooperation among these manifold components was the aim of the Beer Sheva Experiment. I shall give a brief outline of the organizational tools and methods

designed and used and how these contributed to achieving the basic objectives.

THE FORMAL ORGANIZATION

When Prywes and Haim Doron (Head of Kupat Holim) conceived the basic concepts of their plan for the Negev, they gave much thought to the administrative framework. Early in 1973, the main features had already been worked out and implemented long before they were formally set down in writing.

In 1975 the administrative framework was formally defined within the framework of the "Agreement between the University and Kupat Holim for the Establishment of the *University Center for Health Sciences and Health Services in the Negev*." The Agreement had thus far been signed only by the University and Kupat Holim and related mainly to the relationship between these two organizations. However, it mentioned specifically that "... this agreement will become tripartite, and the Ministry of Health will assume the obligations and conditions contained in it, with changes and amendments as the case may require." So far, this has not happened; however, the present text involves the Ministry by including its representatives in some of the committees established and by stating that its medical institutions and facilities in the Negev be incorporated in the Center for its use.

The aim of the Agreement is defined as "combining all health services and medical education" and "to coordinate and integrate all health services." However, side by side with this very comprehensive aim, the Agreement contains a number of provisions that delineate and limit the concept of integration and show what was really intended. These main such provisions state:

- 1) The management of the medical institutions will remain in the hands of officials of Kupat Holim, and the management of the Center in the hands of the University authorities.
- 2) There will be no staff from the Center, and Kupat Holim and University personnel will continue to be employed by the respective institutions.
- 3) There will be no common budget, but "any expenditure...will be made only in the framework of the...budgets of each of the parties."
- 4) There will be no property held by the Center, but any facilities "placed by one party at the disposal of the Center for use, will remain the exclusive property of said party..."

In fact, the process of integration has been vested in the following bodies: the Supreme Coordinating Committee, the Committee for Health Services, the Committees of the Center for Health Sciences and

Services, and the Dean of the Center/Director of the Regional Health Services

Supreme Coordinating Committee

This committee, which was supposed "to function as the highest authority of the Center," is composed of persons belonging to the highest echelon of the University and Kupat Holim directorates and includes also the Director General of the Ministry of Health. Its functions include the formulation of overall policy and long-range plans for the integration of the components of the Center, for the curriculum of the Center and for the regional health services. It even has some vague budgetary tasks—to recommend budget proposals and changes to the directorates of the parties.

Committee of Health Services

This committee was clearly considered to be the most important administrative body of the Center. It was to be composed of the directors of the health service institutions of the Negev, both of Kupat Holim and the Ministry, and of one delegate of the Center. The Dean/Director of the region acts as its chairman.

Its functions are defined as follows: "...to take charge of the management, coordination, promotion and improvement of the medical services provided to... the general population of the Negev." It will "coordinate between the medical institution and the Faculty" and "act towards the integration of medical services and medical education." In other words, it should be in charge of implementing the aims and principles for which the Center was established, but in conformity with the regulations of Kupat Holim, the Ministry of Health and the University.

University Center for Health Sciences and Services

The Agreement provides for coordination and integration between the Center and the health service institutions by giving membership in the Faculty Council to senior academic staff of Kupat Holim and the Ministry, both on the national and regional level. The Faculty Committee includes the Medical Director of Kupat Holim in the Negev as well as the Medical Director of the Kupat Holim headquarters, who, however, has not attended any of its meetings during the last 12 years. No representation of the Ministry was provided for.

The main provisions for coordination between the faculty and the health service institutions are contained in a section of the Agreement—"Duties of the Representatives"—that states the staff members of

the faculty and of the service institutions who serve on any of the committees or governing bodies must, *inter alia*, ensure that the medical curriculum be oriented towards community medicine, that the principle of "those who serve, teach and those who teach, serve" be implemented and that there be "full cooperation, continuous joint action, flow of information and assistance in manpower and facilities between the Faculty and medical institutions."

Dean of the Center and Director of the region

One of the major and determining features of the Beer Sheva Experiment is the "personal union" of the Dean and the Director of all regional health services in one person. His functions are not spelled out in detail, but his status is defined as follows: "He will be responsible to each party for its sphere of competence... by virtue of his appointment by said party. He will also be responsible for the advancement of cooperation between the parties."

The positions of a Dean and of a Regional Director are normally established within the hierarchy of the University and Kupat Holim. However, no equivalent position exists in the formal regional structure of the Ministry, and his status is based on a letter appointing him as head of the Negev region of the Ministry without, however, defining his functions and authorities in any detail.

ACTUAL FUNCTIONS OF THE SYSTEM

In the following, I shall give a brief description of how the various component parts of the system have operated over the years.

Supreme Coordinating Committee

This committee has met frequently on an *ad hoc* basis to handle specific problems, and has generally included the Director General of the Ministry of Health.

Committee of Health Services

This committee was initially considered as the key instrument for achieving the aims of the Beer Sheva Experiment. It should be noted that the Agreement states that "The Center will be *managed* by Committees," and the committee was clearly intended not to function merely as an advisory group, but as an executive body that could take decisions binding on the constituent organizations, at least on the regional level.

Space does not permit a detailed description of the activities of the Committee during the first years of its existence, but a few examples with more general implications will provide a general idea.

The Agreement states that "The establishment,

development, expansion, enlargement... of an institution in the Negev... will be effected after coordination with the parties." Therefore, any plan to establish or abolish any departments, units or other facilities in health services institutions was discussed and had to be approved by the Committee. Any recommendations as to medical appointments, promotions or granting of permanent status had to be approved by the Committee before being submitted to Kupat Holim headquarters, which had also agreed not to appoint to a senior position in Beer Sheva any candidate who was not endorsed by the Committee. In this way, the Committee was used as an instrument to achieve an increasing measure of decentralization, which is a prerequisite for any successful pattern of regionalization.

During the first years of its existence, the Committee enjoyed a great measure of authority, and its resolutions often carried more weight and influence than decisions by any individual institution. In this way, the Committee, through its resolutions, put pressure on the various bodies concerned regarding such issues as increasing the number of interns in the hospital, obtaining development budgets for additional building activities, etc. In addition, the Committee constituted a forum where the senior regional executives met, aired their ideas, solved differences of opinion and decided on measures of coordination and integration.

During recent years, the activities of the Health Services Committee have been drastically reduced. Between September 1973 and September 1978, 58 meetings took place, i.e., an average of one session per month. Since 1983 the number of meetings has been reduced to three and four per year, and the Committee no longer concerned itself with such matters as appointments of staff, establishment of medical units, etc., but with issues of lesser magnitude.

It would seem that the Committee for Health Services no longer serves as a coordinating or executive instrument and has been allowed to lose most of its influence and status. The precise reasons for this development are not entirely clear; perhaps not all those concerned continued to believe in the importance of this committee, and the deteriorating relationship between Kupat Holim and the Ministry might also have been a contributing factor. Alternatively, more efficient and direct means of communication between the local administration and the governing bodies may have pre-empted some of the functions of the Committee.

Dean of the Center and Director of the region

It is hard to evaluate the impact of the merger Dean/

Director on the development of the Beer Sheva Experiment, since much of the influence that the incumbent exercises is of an informal nature and does not find its expression in written protocols, nor has it immediate and overt consequences.

A prerequisite for the exercise of any authority is to be well informed. It took several years until the Dean/Director was recognized by Kupat Holim as being entitled to receive all significant documentation, at least in the form of copies of correspondence. At present he is consulted on any major regional problem, and probably few, if any, significant decisions are made on the regional level without his involvement. On the other hand, the Dean/Director is concerned only minimally with the day-to-day administration of the hospital or the region; for instance, he does not participate in the regular meetings of the hospital management and he is clearly much more involved in the detailed administration of the Center than of the Kupat Holim institutions. With regard to the Ministry, his involvement is much more limited.

The personal inclinations, interests and priorities of the incumbent determine to a considerable extent his impact on the regional health services establishment. Moshe Prywes, the founding Dean, was greatly concerned with the quality of the senior staff and devoted much time and effort to recruiting outstanding physicians to leading and senior positions in the hospital. He also tended to spend considerable time visiting various medical units and establishing informal relationships with their staff so that he was generally well informed about the situation and could solve problems before they acquired grave proportions.

An important facet is the relationship between the Dean/Director and Kupat Holim headquarters, especially in view of the fact that Kupat Holim is an extremely centralized organization whose headquarters wields great authority on all aspects of regional activities. The Dean/Director has access to, and deals with, the highest levels of Kupat Holim. He is involved both in policy decisions as well as in important executive matters concerning the Negev region. However, his actual influence will, to a considerable extent, depend on his personal relationships and the status he is able to establish for himself. It certainly requires a very forceful personality to succeed in obtaining the resources and securing the organizational arrangements that the special features of the Beer Sheva Experiment demand.

It is fair to say that the position of Dean/Director is now well established, at least regarding the Center and Kupat Holim (but not with regard to the Ministry of Health), and it has justified many of the initial

expectations. The limitations on his authority and influence are, to a considerable extent, a function of the strongly centralized organizational pattern of Kupat Holim, and this problem will be solved only if and when existing proposals for decentralization, which have been recommended by a number of investigatory committees, will be implemented.

University regulations do, of course, also impose certain restrictions, but in general, a Dean of a Faculty enjoys a considerable measure of independence, which is rooted in the traditional concept of academic freedom.

APPRAISAL AND EVALUATION

To what extent has the Beer Sheva Experiment succeeded in achieving its defined aims to "coordinate and integrate all health services" and to "integrate medical services and medical education?"

Integration of health service organizations:

Kupat Holim—Ministry of Health

Integration of the regional Kupat Holim services with those of the Ministry of Health has hardly progressed. Preventive and curative services are still far apart and very few organizational changes have occurred. The reasons are many and varied, extend back over many years, and are not relevant to the present discussion. In recent months, with the incentive of severe budgetary restrictions, renewed movement towards integrating preventive and curative services are in the offing.

There has been one positive deviation from this rather discouraging situation. In psychiatry, a pattern of close cooperation exists between the related services of Kupat Holim and the Ministry in the Negev. The Ministry maintains a psychiatric hospital as well as a mental health clinic in Beer Sheva, while Soroka Medical Center has a psychiatric department and a psychiatric outpatient clinic. Both organizations maintain ambulatory psychiatric services in towns throughout the Negev, and all these institutions and their activities are now very effectively coordinated.

Interestingly, the administrative tool through which this integration was achieved was not mentioned in the Agreement, but was created by the Center itself and constitutes one of its important achievements—establishment of the supradepartmental transinstitutional *Divisions* as the basic units on which the organizational pattern of the Center is built. Dr. Falik, the first head of the Psychiatric Division and a strong supporter of the concept of integration of services, succeeded in utilizing this tool for creating a closely knit regional Psychiatry Division composed of the mental health staff of both

the Ministry and Kupat Holim. Professionally and scientifically, there is much cooperation and organizational agreements have been reached concerning the satisfactory division of the ambulatory psychiatric services in the Negev between the two institutions.

Integration of health service organizations—hospital and region

The need for close collaboration between the hospital and the primary health network has been recognized from the beginning, and it was anticipated that the "personal union" of the Dean/Regional Director in charge of all Kupat Holim institutions as well as the Health Services Committee would constitute important unifying forces. However, Kupat Holim apparently had intended to go even further and to work towards a model of complete integration. Attempts were made to achieve this aim from the top. For several years and until 1984, the medical director of the hospital also occupied the position of medical director of the region. In addition, in the late 1970s, an attempt was made to create a similar personal union in the area of administration, and one regional administrator was appointed for both the hospital and the ambulatory services organization. Neither of these experiments succeeded.

From the formal and administrative point of view, the relationship between the hospital and the primary health network is hardly any closer than it was 10 years ago, but there has been a new commitment on the part of Kupat Holim authorities to change this in the near future. On the other hand, much professional coordination carried out by the Divisions exists and is growing. The chief of the Pediatric Division is responsible for the pediatric services both in the hospital and in the clinics, and the same applies for gynecology, orthopedic surgery, and other departments. Another important development that has occurred in this respect is the arrangement according to which each clinic is affiliated to a particular department in the hospital for hospitalization of its patients. In this way, a permanent professional relationship between the clinics in the region and the hospital has been created which should lead towards closer integration of the services.

Another factor that tended to strengthen the relationship between hospital departments and primary health clinics is the presence of graduates of the Beer Sheva medical school in both institutions. Of every graduating class, a number of young physicians volunteer for 1 year's service in clinics in the Negev. Having completed their clerkships and often also their internship in the Beer Sheva hospital, they obviously have close connections with their former

teachers and with their classmates in specialty training at the hospital.

This personal relationship strengthens the cooperation between the clinics and the hospital. Hopefully, as more graduates from the school and family medicine residents from the school's training program accept permanent employment in Negev clinics, these relationships will be strengthened.

Cooperation between the faculty and health services organizations

Integration between the health sciences and the health services has advanced greatly and can be considered quite a success. Although the formal arrangements, such as the personal union of Dean/Director, have contributed to this development, one can observe here also a process of natural evolution. Most of the staff of the faculty are employed by the hospital; they teach not only clinical subjects, but also a part of the basic medical sciences such as pathology, physiology, biochemistry, etc. Gradually, they took over many of the most important functions of the faculty by becoming active members of the Faculty Committee, the Research Committee, the Library Committee and the Curriculum Committee. When the Dean appointed a number of assistant deans for such areas as student affairs, recruitment and promotion, etc., most of them were clinicians. All department chiefs hold academic appointments, as does the Medical Director of the hospital. The Pharmacology and Virology Units of the faculty perform the clinical tests, and there are close connections between the Immunology Unit and the Immunological Laboratory at the hospital.

As a result of these developments, a great part of the medical staff has become integrated, in the sense that they tend to look at situations and problems equally from the point of view of the hospital and from that of the Center which was one of the principal aims of the Beer Sheva Experiment.

On the organizational level, a similar development can be observed. A number of common institutions have been established—such as the central medical library, the animal house, an electron microscope unit and a medical computing unit—which serve teachers, students and the health staff of the region. More and more, medical equipment is purchased jointly out of Center and Kupat Holim funds; fellowships for postgraduate clinical training funded by the university are annually awarded to young physicians. A visiting professors program, financed out of donation funds to the Center brings annually about 10 eminent consultants, most of them clinicians, from the most prestigious medical institutions to spend several weeks here at the Center. Every year

the Research Committee of the Center distributes research grants, which are financed out of the University budget, to investigators, most of whom belong to the hospital staff.

The relationship with the primary health organization of Kupat Holim is less close. One of the reasons might be that only a small (but growing) number of the primary health physicians hold academic appointments, and there is, therefore, less involvement in the life of the Center. On the other hand, the "Graduates Program," which is described elsewhere in this publication, has involved a great measure of cooperation and coordination and certainly contributed towards the integrative process.

The relationships between the Regional Organization of the Ministry and the faculty are satisfactory, although not as close as with the Kupat Holim institutions. Students are taught in the psychiatric hospital and in the maternal and child clinics; they are also taught in a few departments of the Ministry's Barzilai Medical Center in Ashkelon, where some of the teachers hold academic appointments in the Center. The Ministry's Medical Director of the region held a number of faculty positions, including most recently the important function of Head of the Students' Selection Committee. However, there is practically no administrative cooperation and very little involvement of the Center in the public health field.

CONCLUSION

In this paper, I have attempted to show the extent to which the Beer Sheva Experiment has succeeded in establishing in the Negev a comprehensive regional health services delivery system, to be composed of the existing health service institutions and the Center. As observed, there has been little progress towards the integration of the two main health organizations, that of the Ministry of Health and that of Kupat Holim, with the exception of the area of psychiatry where, by means of the newly established divisional structure, a great measure of professional cooperation has been achieved. Little administrative integration between the hospital and the primary health care delivery system has taken place in spite of several attempts made during recent years. These attempts are presently being renewed.

The integration between health sciences and health services has been much more successful and has had an important impact on the quality of health care in the Negev. This is probably the special contribution which the Beer Sheva Experiment has made towards creating new concepts and principles of health services delivery and towards showing a way of realizing and implementing these concepts.

THE CHALLENGE: CHILD HEALTH IN THE NEGEV

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Key words: Beer Sheva Experiment; medical education; health care services; pediatrics

The inauguration of the Ben-Gurion University of the Negev Center for Health Sciences and Services in 1974 provided an opportune time to initiate changes in the structure as well as in the content of health care delivery to the children in the Negev. Community orientation and integration of medical services, which were central objectives of the medical school (1, 2), were viewed as proper solutions to the generally recognized deficiencies in the provision of medical care to the children in the area.

The population of the Negev is young and ethnically heterogeneous (3). Over one-third of the population is 14 years old or younger; approximately one-third of infants are born to Bedouin families and two-thirds to Jewish (mostly Sephardic) families. The commonest causes of hospitalization are gastrointestinal and respiratory infections for Bedouin and Jewish children, respectively (4). In the Negev, as in the country as a whole, there is no lack of physicians; the number of pediatricians per 1,000 children in Israel has been estimated as 0.9 (5).

It is distressing for patients as well as for health care personnel to deal with two discordant and uncoordinated levels of pediatric practice—in the hospital on the one hand, and in primary clinics in the community on the other. While hospital services have been academically oriented with a tendency to progressive specialization, no major changes in the traditional and uniform pattern of community clinics could be foreseen prior to the establishment of the medical school in Beer Sheva (6). The medical services for the sick child outside the hospital were

provided by pediatricians and general practitioners who had been trained in different countries, resulting in a serious lack of uniformity in the standards of these physicians. In addition, the structure of the system contributed to the gap between the two levels of medical care (hospital vs. community clinics). The vast majority of the pediatric population had access to a health care system through a well-developed and highly centralized network of clinics, but its medical care was fragmented and often duplicated in different institutions [the therapeutic clinics of Kupat Holim (Health Insurance Institution of the General Federation of Labor) and the preventive Maternal and Child Health clinics of the Ministry of Health]. Just as the clinic pediatricians practicing in the community did not participate in the care of the hospitalized child, so too the hospital pediatrician had no responsibility for the care of the child within the community clinics (except for routine examinations of the well child and/or pediatric consultations in clinics of certain kibbutzim and development towns).

As part of the overall goal of the new medical school, it was anticipated that some of its students would seek careers in the ambulatory setting and be interested in the delivery of health care to children. In view of the community orientation and the lack of adequate role models for the student, it was expected that hospital pediatricians would increase their degree of involvement in community clinics. This focus implied a change in their attitudes towards professional values and day-to-day practice. In addition, it was hoped that some pediatric residents in the teaching hospital of the medical school, the Soroka Medical Center, would depart from the traditional choice pattern of a hospital career and would choose to work chiefly as primary care pediatricians

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and as consultants to community clinics. It was not certain whether these ambitious plans were achievable.

Fundamental changes took place in the hospital pediatric services during the first decade of the medical school. Some, such as the integration of the existing three pediatric wards (departments) into the Division of Pediatrics, were initiated by the medical school. This integration led to a more logical and functional structure both for patient care and for teaching at all levels. One cardinal concept of the Division of Pediatrics was its responsibility not only for hospital care, but for the health care of all the children in the Negev, including community pediatric services. Pediatric admissions to the hospital were regionalized, and clinics within the community were linked to each of the departments in the Division. Other innovations in the hospital represented a trend seen in the whole country: emphasis on ambulatory hospital services at the expense of inpatient beds (16 specialty and follow-up pediatric clinics and a Day Hospital Unit were opened). In addition, a general Pediatric Intensive Care Unit, a Premature and Special Care Nursery, and (for the first time in this country) an Adolescent Unit were established.

Inspired by the philosophy of the medical school, a significant number of Western- and Israeli-trained hospital-linked pediatricians accepted the challenge of delivering primary care and consulting in community clinics, particularly in poorly developed towns such as Ofakim, Yerucham, Mitzpe Ramon, and the Bedouin town of Rahat. The head of one of the hospital pediatric wards (who had been the first pediatrician in a Beer Sheva hospital—Dr. Wilhelmina Cohen) chose to take a position in the primary clinic of the socioeconomically deprived town of Ofakim after retiring from her hospital position. Today, no less than 10 pediatricians who have completed the residency program at the Soroka Medical Center have mixed primary care clinic/hospital duties, and several of them hold academic appointments and teach medical students both at the hospital and at their clinics. The Division of Pediatrics grants hospital rights and duties to some of them with the intention of bridging the gap between the hospital and the community-based children's clinics (7). Simultaneously, hospital-based pediatricians have expanded their consultative and well-baby services in the community clinics. Preventive and therapeutic primary care services are still provided by separate organizations. However, in four communities an experimental program exists whereby the identical hospital-linked primary care physician provides care both at the Kupat Holim therapeutic

service and at the Maternal and Child Health clinic. The goal has been the establishment of model pediatric community clinics that would favorably affect patient care. We have shown that such a clinic results in much more effective use of hospital emergency room facilities when compared with clinics using the traditional referral pattern (8).

Hospital pediatric residents participate in primary care activities; all of them rotate through a primary care pediatric clinic in the community under faculty supervision (as part of their residency training program). In addition, several have volunteered to interrupt their formal residency training for a period of up to 1 year in order to serve in community clinics.

Teaching pediatrics to medical students is carried out within this atmosphere (9). Already during the early preclinical years, the student is exposed to aspects of physical as well as psychomotor, social and mental development. This part of the curriculum functions chiefly in day care centers, community clinics and schools. The traditional pediatric clerkship during the 4th year of medical school (involving mostly hospital inpatients) still exists. However, we have added (beginning 1985-86) mandatory clerkships in hospital ambulatory pediatrics and in community pediatric clinics during the 6th year of medical school. The curriculum thus provides an ongoing exposure to child care with special emphasis on preventive and ambulatory aspects of pediatrics.

In Beer Sheva, as in other academic settings, clinical research is carried out in the various pediatric subspecialties, but with a major focus on the most characteristic pathology seen in the Negev.

Looking back on the first decade it is apparent that the tasks undertaken have been directed toward the implementation of the initial objectives. Yet, one of the main drawbacks has been the lack of success in establishing solid educational models for the provision of primary care to children. One pediatric community clinic, after major progress in becoming an academic focus of excellence, failed to withstand the political pressures after its leader gave up his supervisory position (10). That experience in particular makes it clear that basic alterations in the organization of the services sanctioned and encouraged by the highest level of our centralized system (and not only motivation of the clinic physician) are necessary to bring about the needed transformation of the community clinics.

It seems that full implementation of the planned changes of the structure of medical services in the Negev under the direction of the Dean of the medical school (including a more autonomous and unified administration) may be necessary for the definite establishment of high-level hospital- and medical

school-linked primary care clinics as well as for a much more substantial involvement of the Division of Pediatrics in the Community.

Several issues have not yet been adequately addressed. Assuring both quality patient care and continuing education of health care personnel in community clinics is central to the success of the entire project. There are obvious advantages to the provision of medical care by organizations (such as Kupat Holim and the Ministry of Health) rather than by individual physicians. However, a potential drawback is the absence of a physician who is primarily and continuously responsible for the child and implements his/her total care. This need is paramount for disabled and chronically ill children (11). This question, as well as how to develop an optimal patient-doctor relationship within such a system, remains largely unanswered.

Plans exist for the involvement of all hospital-based pediatricians in the community clinics. However, in view of the need for advanced specialization in certain fields of pediatrics, the degree and nature of their participation in the care of the patient outside the hospital need to be more clearly defined.

The objectives of the Division of Pediatrics include not only the provision of services of high quality to individual patients within the hospital setting and in the primary care clinics, but also the effective handling of neglected areas of child health within the community. These areas include assessment of the state of health of different pediatric populations in the Negev. Also included are the design and mobilization of strategies to deal with the shortcomings found. The concept of community-oriented primary care (12, 13) poses a challenge to the pediatrician who may find in it a source of inspiration to improve the health of children as well as to design educational and research objectives.

This article describes endeavours of many dedicated people of the Division of Pediatrics and of the University Center for Health Sciences in Beer Sheva with whom the author has had the privilege of sharing these intellectually challenging and fulfilling experiences. Conversations with distinguished visiting faculty from abroad have enlightened the perspective of the community-oriented role of the Division of Pediatrics.

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PSYCHIATRY AND PRIMARY CARE

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Key words: Beer Sheva Experiment; medical education; health care services; psychiatry

When we established the Psychiatric Division of the University Center for Health Sciences and Services in Beer Sheva in 1978, we immediately had to face a serious problem, namely, how to teach simultaneously: 1) the theory and practice of major psychiatric diseases, such as the organic-brain syndromes and the functional psychoses; 2) current daily psychopathology, such as neuroses, personality disorders and transient adjustment reactions to stress situations; and 3) the psychosocial aspects of disease in general. We had to emphasize all three abovementioned subcategories, as well as the preventive and community-related aspects, on the one hand, and the clinical, therapeutic and practical approach, on the other—including basic principles of individual, family and group therapy.

It was finally decided that the clerkship in psychiatry (5 weeks during the 5th year) would be dedicated mainly to "major" psychiatry, whereas the other two subjects ("2" and "3")—we hoped at the time—would be taught in the framework of the other clinical clerkships. During the clerkship in psychiatry, students would also have opportunities to observe various activities of the psychiatric outpatient clinics, including their outreach program. In addition, they would join psychiatric consultants during their consultations in the different departments of the general hospital and in the community primary care (CPC) clinics.

It has been shown by several investigators (1, 2) that most people who have minor (nonpsychotic) mental and emotional disorders never reach the mental health services. Those who do seek professional help within the framework of the health services

usually turn to general primary health care, i.e., that provided by the general practitioner or the family physician and his/her team. It was therefore obvious to us that medical students should receive their training in current, daily psychopathology during the clerkships in primary medicine. Moreover, the postgraduate training in this area should be an integral part of the residency program of family medicine.

We planned to teach the third subject (psychosocial aspects of diseases) during psychiatric consultation-liaison programs to be carried out in various clinical departments of our general university hospital.

Now, 10 years after the foundation of the Center and 7 years after the establishment of the Psychiatric Division, we can point to some successes and also a number of failures and problems that have emerged during the implementation process. In the first part of this paper, I would like to discuss especially the collaboration between the Psychiatric Division and the Division of Health in the Community, in which the Departments of Primary Medicine and Family Medicine are located. The second part will describe some of the basic problems that arose in teaching psychosocial aspects of diseases.

COLLABORATION WITH THE DIVISION OF HEALTH IN THE COMMUNITY

During the first of the two clerkships in primary medicine (which used to be in the 5th year and was recently moved to the 4th), students were spread over 10 teaching CPC clinics in the Negev—usually two to three students per clinic. It was our goal that during their clerkship they would meet the psychiatric consultant of the CPC clinic on several occasions in order to discuss with him/her some patients or families with psychosocial problems. In order to

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implement this plan, the Psychiatric Division developed a consultation-liaison program in the above-mentioned 10 teaching CPC clinics: consultations of 1½ hours were held every 2 to 3 weeks during the entire year, not only during the primary medicine clerkship. The same consultants (psychiatrists, clinical psychologists or psychiatric social workers) always visited the same clinic and the general practitioner in charge of the clinic organized and chaired the meeting and was responsible for the agenda. With the creation of a position for social worker in primary medicine (3, 4), the social workers of the CPC clinics also began to play an important role at these educational meetings. At each meeting, not more than two patients (families or problems) were discussed. Sometimes the patient (or family) was presented and interviewed by the consultant in the presence of the staff and the students. Usually after the case presentation some practical and some relevant general theoretical points were discussed, making it an experience from which the student could learn how to handle similar problems. Every student (or pair of students) had to present a family to his/her (their) peers and faculty members during the clerkship. It was intended that while preparing this presentation, the students would consult the psychiatric consultant of the CPC clinic, and that the consultant would participate as a discussant in the presentation.

Over the years it was difficult to fully implement the abovementioned program, mainly because of organizational problems and the shortage of teaching personnel in the Psychiatric Division (e.g., the clerkships in psychiatry and in primary medicine often took place at the same time in two parallel groups). In spite of these difficulties and our irregular participation in the clerkship of primary medicine, we were able to demonstrate to the students that psychiatry is an organic part of the comprehensive approach that forms the basis of general primary medicine and family medicine.

As this paper deals mainly with the undergraduate education of medical students, I shall mention only briefly some highlights of our activities in the postgraduate program in family medicine (which takes 4 years). During their clinical residencies, residents in family medicine spend 1 day a week in theoretical training, which includes psychiatry and the behavioral sciences. Our training of residents in family medicine is given in three areas: 1) theoretical seminars; 2) "Balint groups"; and 3) participation in the family presentation of the residents. The theoretical seminars deal with such subjects as: the individual and family life cycle-related chapters of psychopathology and psychosomatic medicine that are rele-

vant to the general practitioner, an introduction to psychotherapeutic interventions, and counselling in different areas. During the final academic year we try to introduce methods of learning in small groups, with the seminars focusing on the case presentation. The "Balint groups" are discussion groups of 10 residents with two leaders, a psychiatrist and a clinical psychologist. In these groups, which function for 2 years, the topics discussed include: "the doctor-patient relationship, patients with mental disorders (who approach general practitioners), and emotional problems of the physicians (residents) themselves (which appear in their relations with patients, colleagues and hospital administrators). Special attention is paid in the Balint groups to development of the professional identity of the family physician." The family presentations are essentially a continuation at a higher level of those described above. Besides this regular residency program, 1-day workshops are organized covering special subjects close to psychiatry, such as: the use of hypnotic methods in general medicine, health problems of new immigrants from Ethiopia, etc.

The Psychiatric Division has made an enduring effort to participate in the residency program of family medicine. We feel that this contribution has been a success. Our goal is to increase the general practitioner's sensitivity to mental health problems, to improve his/her ability to detect and define these problems, to devise a reasonable treatment plan that could include a well-reasoned referral to the mental health services, and to follow up patients. We are now planning a critical evaluation of this educational program and its results in daily practice. I believe that we have achieved many of these goals. Our positive experience with family medicine residents has encouraged us to intensify our participation in the undergraduate clerkships of primary medicine, which can be seen as an introduction to family medicine.

PSYCHOSOCIAL ASPECTS OF DISEASES

With respect to the teaching of the psychosocial aspects of diseases, we have to admit that the relationships between psychiatry and the general departments of the hospital are much more complicated than those with primary medicine.

Clinical clerkships begin in Beer Sheva in the 4th year. Before that, during the 2nd and 3rd years, behavioral sciences and communication skills are taught. Parallel with this teaching, the Psychiatric Division is responsible for two courses: 1) *Introduction to Psychopathology*; and 2) *Clinical Days* during which the students encounter a patient from the mental health clinics for the first time.

This teaching of behavioral sciences, psychopathology and mental health used to be interrupted between the 3rd year and the psychiatric clerkship in the 5th year, but this gap was eradicated during the 1985-86 academic years by the introduction of active programs in the 3rd and 4th years. It is our impression that during this period a dichotomy between "soma" and "psyche" develops in the minds of most of our students. It thus becomes more and more difficult to preserve the basic integrated and comprehensive approach of our faculty during these two critical years (3rd and 4th). Two examples illustrating this development follow. First, some years ago the first clerkship in internal medicine, which lasts 3 months, included 1 hour (!) for a "psychosomatic case presentation"—this instead of emphasizing the bio-psychosocial approach in *all* diseases. Second, in the introductory course to *Obstetrics and Gynecology*, 1 hour (!) is reserved for all psychosomatic aspects of this important domain.

In collaborating with other members of the faculty who also became aware of this compartmentalized thinking, which almost separates psychiatry and behavioral sciences from "real" medicine, we have tried to overcome this in different ways. Members of the Psychiatric Division have begun to participate in the introductory program to the internal medicine and pediatrics clerkships. In one of the internal medicine departments a psychiatrist and a clinical psychologist conduct regular psychosocial conferences with students and residents; in another department of medicine a senior psychiatrist participates regularly in the rounds.

The implementation of such projects has always been difficult, and we have had to overcome much resistance. Indeed, they have often collapsed after a trial of 1 or 2 years. This is not surprising, as it is well known from the literature (5) (and from my personal experience) that it is difficult to integrate the attitudes and ways of thinking of the "medical practitioner" and the "psychological practitioner"; they are often basically contradictory, e.g., the medical practitioner is mainly goal oriented, while the psychological practitioner is more process oriented. Nevertheless, it has been shown that it is possible to unify both models in one person. We feel that if we had enough professional personnel we would be able to organize a regular psychiatric

consultation-liaison program at least in the departments of medicine, as we have done in primary care clinics. We want the medical students (and faculty members) to perceive us and psychiatry in general as an integral part of the general health services and to take into account the psychosocial aspects of each patient in attempting to understand the genesis and course of a disease. These psychosocial aspects may also play an important role in the construction of a reasonable treatment plan.

It should be emphasized that until May 1984, the psychiatric service in the general hospital operated as an outpatient clinic. In 1984 a small psychiatric inpatient department was established, which enhanced our status in the general hospital. It served as a base for our consultative service and enabled us to hospitalize patients with mixed medical and psychiatric problems.

SUMMARY

Besides the traditional clerkship in psychiatry, the Psychiatric Division has tried to develop the psychosomatic and psychosocial dimensions of other clinical divisions. This effort was rather successful in primary medicine in the community, especially in family medicine. However, it seemed to be quite problematic in various departments of the general hospital, where we have only partly achieved the realization of the bio-psychosocial model in medicine.

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GERIATRICS IN THE FRAMEWORK OF UNIVERSITY-BASED COMMUNITY MEDICINE

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Key words: Beer Sheva Experiment; medical education; geriatrics; health care services

The elderly population in Israel is rapidly increasing both in absolute terms and in proportion to the general population (1). The aged in the Negev have special characteristics, related mostly to their diverse cultural backgrounds and behavior, and many of their medical and social problems are probably related to their cultural background (2). The geriatric services in the Negev were developed with special consideration of these characteristics. The main goal of these services is to keep the elderly in their own environment wherever possible. The strategies used by the Geriatrics Department of the Soroka Medical Center in terms of services, teaching and research have been described (3). The geriatric service in the Negev was launched in 1974 with coordination of the various institutions involved in the delivery of services for the aged—Kupat Holim (Health Insurance Institution of the General Federation of Labor), the Ministry of Health, the Association for the Welfare of the Aged and the municipality of Beer Sheva.

Kupat Holim operates the Geriatrics Department for patients in acute condition and for rehabilitation at the Soroka Medical Center (headquarters of all the services). The Home Care Unit (HCU) and the consultation clinic are a part of the Department of Geriatrics. The Ministry of Health operates the Department of Gerontopsychiatry and part of the preventive program together with the HCU, and is responsible for the provision of medical appliances for the handicapped. The Association for the Welfare of the Aged (a volunteer organization) operates the Home for the Aged (long-term care)

and also some of the community services such as "meals on wheels." The municipality of Beer Sheva, through the Department of Welfare, operates the clubs for the aged and also "meals on wheels." Other organizations involved are *Matav* (domestic aides), the pensioners and volunteers, and the National Insurance (*Bituach Leumi*). All the above institutions work in an interlinked and complementary fashion. Patients are referred for geriatric consultation either by family physicians or by hospital departments. After a thorough evaluation, the patient is placed in the most suitable setting in accord with his or her needs. Staff meetings with representatives of the various institutions are held regularly, thus allowing an ongoing assessment of patients by a multidisciplinary team and flexible shifting to other services in order to meet new demands.

TEACHING PROGRAM

With the opening of the medical school in 1974, a comprehensive curriculum in geriatric medicine was developed both for the medical school and for the Recanati School of Community Health Professions (4, 5). Teaching takes place in the departments, the home for the aged, clubs for the elderly, homes of the patients, etc. All the instructors—physicians, nurses, physiotherapists, occupational therapists and social workers—are involved in the services for the elderly.

In the medical school, the 1st year is devoted to teaching basic skills in communication, observation and nursing. At the same time, the principle of continuity of care and the multidisciplinary approach to the geriatric patient is emphasized. The student spends 6 days in geriatric settings, interviewing patients and participating in their care. The 2nd and 3rd years of study present a few topics in geriatrics—these include lectures on the physiology of aging

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within the course in biology and a few lessons on the physical examination of the elderly patient. In the 4th year of study, within the framework of a medical clerkship, different issues on aging are addressed, and in 1985, a new, separate clerkship in clinical aspects of the elderly was introduced. In the primary care clerkship in the 5th and 6th years, the plan is to continue the students' exposure to the problems of the elderly by involving them in the activities of the HCU. Here emphasis is placed on the special needs of the homebound and bedridden patients in the community.

The Recanati School of Community Health Professions has a course in communication for the 1st-year nursing students which is similar to that for the 1st-year medical students. In addition, at the end of this course, geriatric nursing is taught intensively.

During the 2nd year at the School of Physiotherapy, 2 or the 7 months of clinical exposure are devoted to work with the elderly in different geriatric and rehabilitation hospitals. In the 4th year, a project in geriatrics is a prerequisite for the bachelor's degree. In addition, in the 2nd year, nurses and physiotherapists are given a course in geriatrics, including biology, normal aging, basic clinics and pharmacology for the aged. Permanent courses in geriatrics are given to family physicians, community nurses, domestic aides, directors of centers for the aged, volunteers, pensioners, public health activists and high school students.

The development of the geriatric services in the Negev has fulfilled two basic principles in geriatric medicine: 1) a hospital-community continuity of care, and 2) permanent assessment by a comprehensive multidisciplinary team. The fact that the Department of Acute Care, the Gerontopsychiatrics Department and the HCU on the one hand and the Long-Term Care Unit on the other hand are under the same direction, presented a unique opportunity to use the various geriatric services in a rational way. This system has several advantages: patients are easily placed in the most suitable setting for treatment; a common problem for geriatric patients is their need for transfer to other services with the resultant delays and unnecessary occupancy of beds needed for other patients. Waiting lists and delays have been significantly reduced in the Negev (6). A regular schedule of staff meetings and informal contacts among the different teams enhance this trend. Another important advantage is that these teams have the same level of knowledge, acquired through permanent ongoing teaching programs, which ensures a uniformly high level of care for the patients wherever they are placed.

The HCU is attached to the Geriatric Department

at the Soroka Medical Center and acts as a consultant for the family physician in the management of homebound and bedridden patients (7). This unit has strong links with all the medical and social agents in the community. It carries out programs of prevention, such as detection of high-risk subgroups or vaccination against influenza. Eighty-three percent of the family physicians in Beer Sheva interact actively with the HCU; this cooperation was the result of the HCU's deliberate policy of including the family physicians in home care at all stages, while in no way seeking to usurp their functions. It is likely that this close cooperation will result in the primary care team acquiring extra skills in geriatrics. An overall estimation of the cost of care for the geriatric patients in Beer Sheva showed that it is among the lowest in the country (8).

Effective integration of geriatric services with the community works fairly well in Beer Sheva; however, coping with the elderly in other areas of the Negev, far from the main city, requires a different approach. These areas do not have adequate social services for the aged, and the primary care team is not easily reached by the consultants. A regional system of services with a geriatric nurse having a key role might be an adequate answer in this situation (9).

The curriculum for the medical school and the Recanati School is unique in its extent and concern for the comprehensive care of the elderly (4, 5). The aim of the teaching program is to deal with the need for: 1) community-oriented continuity of care; 2) a multi-disciplinary team approach; 3) a comprehensive clinical approach toward the elderly; and 4) transforming geriatric medicine into an attractive field of specialization. These four points have been extensively considered elsewhere (5). The concept that teaching takes place wherever the elderly get services and that teachers are those involved with the delivery of services, is in accord with these aims and is in the spirit of the Beer Sheva credo: "To teach is to serve, to serve is to teach" (10). A study carried out in order to assess students' attitudes toward the elderly, prior to and after exposure to the 1st-year curriculum in geriatrics, showed that positive attitudes were reinforced (4).

In spite of the above achievements, a few problems should be emphasized. The gap between the preclinical and clinical years is evident, especially when students become much more interested in pathophysiology, than in the social problems accompanying the multiple pathology of the aged. Part of the problem is probably related to the negative role models in terms of attitudes to which students are exposed in the clinical years. The positive

role models, it is hoped, will be found when graduates of Beer Sheva begin to infiltrate the health care system. An initial move in this direction is currently under way—graduates specializing in family medicine are demanding more training in geriatrics, and several graduates are interested in specializing in geriatric medicine. The decision of the faculty to establish an independent clerkship in geriatrics in the 4th year, and the requirement for a special seminar in geriatrics prior to qualifying for the bachelor's degree at the School of Physiotherapy at the Recanati School are consistent with this policy.

The research is also community oriented and deals with the special problems of the elderly in the Negev. Two studies were carried out in order to ascertain the medical and social needs of the elderly in Beer Sheva (2, 11). The conclusions were applied in order to raise the awareness of family doctors, medical students and other medical agents in the community to these problems. This information also permitted us to plan services and research areas for the future more effectively. One such area is the research on Vitamin D levels in the elderly. Our current conclusion is that the low level of vitamin D metabolites in the healthy elderly in the Negev is probably one of the reasons for the large number of elderly patients with hip fractures (12-14). A multidisciplinary team comprised of geriatricians, orthopedists, nephrologists, radiologists, biochemists and epidemiologists intends to link findings of the research in the community (2), such as falls, loss of vision, poor housing, etc., with those of the laboratories. The goal is the development of a comprehensive research program aimed at the prevention of bone disorders in the elderly.

In summary, a community-oriented approach in medicine is most effective to fulfill the requirements for the proper development of geriatrics in terms of

service, teaching and research. Undoubtedly, the program presented in this paper is stimulated by the philosophy developed at the University Center for Health Sciences and Services at the Ben-Gurion University of the Negev.

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THE GRADUATES (*BOGRIM*) PROJECT—MY EXPERIENCE IN NETIVOT

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Established in 1974, the University Center for Health Sciences and Services at the Ben-Gurion University of the Negev was founded on the principle of merging medical education with medical care toward improving the health of the population. The goals are described in the introductory paper of this issue (1). Educated on these principles, a small group of my classmates from the first class of this school was disappointed to see, during the 6 years they spent in school, that the primary health services remained inadequate and relatively unchanged. We were therefore concerned lest the lofty aspirations of our school would remain as ideas only.

Accordingly, we decided to volunteer to serve for a period of time in primary care clinics and to introduce changes that would enable us to practice and teach primary care at the same level taught in the medical school. We were afraid that without such a step, much that we were taught would remain a beautiful but impractical and inapplicable theory. Our group grew rapidly and our enthusiasm spread to most of the class, until finally, 18 of the first 30 graduates joined what we called the *Graduates (Bogrim in Hebrew) Project*.

We began in October 1977, by trying to define our aims and goals as well as the problems facing us. I will describe these in relation to education, service and research, and then illustrate the changes wrought by the Project in each of these areas.

EDUCATION

The quality of the education we received at medical

school in primary care was considerably lower than that given on the wards of the hospital, both quantitatively and qualitatively. The exposure to primary care medicine consisted of 2 months of clerkship—1 month during the 5th year and another in the 6th year. We considered this inadequate, especially in a school whose major emphasis is on primary care medicine, and felt that additional months in family medicine should be added. We were concerned that while in all fields of hospital medicine there existed appropriate role model personalities, such individuals did not exist in family medicine. A leader-role model contributes much to the attractiveness of a hospital residency as compared with one in family medicine. We were worried by the fact that during our years of study, the Dean and the faculty had been unable to recruit even one permanent leading physician in the field of family medicine, but apparently had had fewer problems in attracting renowned physician educators in the various fields of hospital medicine.

Postgraduate medical education for primary care physicians barely existed. Although such education had been proposed by Dr. Moshe Prywes 10 years earlier (2), no effective steps had been taken in this direction. We were afraid that after a few years in primary care clinics, without ongoing education, we would become obsolete and unprofessional.

We were troubled by the low motivation of the graduates toward a future in primary care. We thought that encouragement in this direction should begin at an earlier stage of the spiral (3) and not in the 5th year, when the student's wishes and objectives are often already established.

We were faced with the further problem that the faculty had not decided which model it wished to encourage—primary care medicine (i.e., internal

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medicine/pediatrics) or family medicine. Some of us saw this question simply as a semantic one, but others felt that the school had to decide and announce its intentions clearly, and then carry them out in the field.

We found that while a tremendous investment had been made in changing the teaching system and in building a new model of a medical school, little had been invested beyond the hospital and the faculty to change working models or to prepare suitable clinics in which the graduates could apply the advanced teachings of the school. The promises that we would be our own role models, the "doctors of the future," in a new model of medical care would be shattered in the light of the sad reality of the clinics and their heavy work load.

The Project's impact on education

The difficulties faced in the clinics were foreseen, and we found that the good training we received in the school did enable us to deal adequately with many of the medical and administrative problems met at the clinic.

The graduates became models to medical students and to the staff at the clinics. For the first time, the students encountered an organized, well-functioning team, consisting of a physician, nurse and medical secretary. They saw a model of a young physician trying to apply what he or she had learned in a different field of "battle" and not doing badly for all that. But we felt that the school too had to help its graduates survive in the clinics in order to reinforce the model.

The Graduates' clinics served as teaching centers, not only for medical students from Ben-Gurion University and from abroad, but also for student nurses from the Recanati Nursing School and the social work students from the new Department for Social Work at Ben-Gurion University. Unfortunately, most clinics still lack adequate space to accommodate all these students; this problem will have to be solved so that the students can benefit optimally from the time spent in the primary care setting.

In order to allow the medical graduates to keep abreast of medical advances, half a day each week is set aside for continuing education. Part of the morning might be spent attending a ward round, visiting hospitalized patients, consulting with specialists or reading in the library. The rest of the morning consists of a formal program (4), including case and family presentations, a journal club and seminars concerning relevant subjects presented by senior faculty members. These meetings, which also provide an opportunity for an exchange of ideas by a peer group, are very popular. In addition, a series of

seminars was held on the subject of psychosexual problems, and a successful workshop was carried out to teach ambulatory surgical management of problems commonly encountered in primary care.

We arranged a system of consultations in the clinics by visiting specialists on a regular basis. The meetings allowed the medical staff in the clinics to present a limited number of cases that were usually followed by an in-depth discussion of the problem. In addition to providing solutions for difficult cases, these consultations provided an invaluable and excellent teaching experience. However, we found that the specialists lacked orientation in community health and needed some training in the field of family medicine before they went out to work as consultants in primary care clinics. Their residencies had not prepared them adequately for dealing with the specific health problems they confronted in the community. We felt that a year of service in primary care clinics should be a part of the training of all graduates. It was unanimously agreed that this year was invaluable and crucial to our development as physicians in any specialty area.

We were unable to combine successfully curative medicine with preventive medicine, and this problem will have to be dealt with in the future. We lacked sufficient interaction with the emergency room, which was our natural point of contact with the hospital. We thought it would be worthwhile to create a framework of weekly meetings between primary care physicians and the emergency room team to discuss hospital referrals. Such meetings could be of mutual benefit, resulting in improved communication and medical service to the emergency room consumers from the communities.

Each clinic received a library stocked with basic modern text books applicable to primary care, and two medical journals of its choice. This modern literature is of great benefit to the staff of the clinics, enabling them to keep up with recent developments.

SERVICE

Dr. Haim Doron, National Director of Kupat Holim (Health Insurance Institution of the General Federation of Labor) recently stated that the Graduates in the Negev had revolutionized primary care in their area. To illustrate this "revolution," I will describe some of my personal experience in the Netivot Clinic where I served for 3 years, 2 of them as director of the clinic.

When Drs. Orkin and Paz and I joined the project, we looked for a clinic with particularly difficult problems, where it would be possible to affect significant changes within a short period of time. The following is a partial list of the problems we faced

prior to starting our year of service in Netivot: 1) lack of suitable equipment; 2) lack of teamwork; 3) absence of or poorly maintained medical records; 4) overwhelming physician work load; 5) poor care of the elderly population; 6) inefficient laboratory services; 7) absence of on-site specialty consultation; 8) lack of cooperation between the clinic, local social services and the local municipal council; 9) lack of a communality of identity between the graduates and the physicians already in the clinic (not from the *Graduates Project*); 10) inefficient clinic administration (e.g., missing files, poor relationship with parents, unnecessary bureaucracy); 11) insufficient support services (e.g., X-ray, physiotherapy); 12) absence of night services; 13) no overall preventive health service; 14) inefficient psychosocial services; 15) poor telephone communications inside and outside the clinic; 16) no academic supervision; and 17) no health education program.

Within 2 years of work in Netivot, we saw tremendous changes and many of these problems had actually been solved. Vital equipment was provided, including an electrocardiograph, ophthalmoscope, anoscope, incubator, and first aid and resuscitation kits. The clinic was reorganized into five medical units (doctor-nurse), and we have had progressively close teamwork and excellent cooperation on the part of the nurses. More than a 1000 new problem-oriented medical records have been opened. More than 50% of the old files have been transferred to the new format, and the problem of missing files has been considerably reduced. The quality and organization of medical records have thus improved tremendously. One of the outstanding achievements has been the transfer to an uninterrupted work day (in contrast to the split shift system) and the introduction of an appointment system, while still permitting the treatment of urgent cases referred by the nurse. These changes significantly decrease the work load of the physicians, providing prompt service to the patient as well as free time for staff meetings and preventive medical care. Since the switch to the new system of work, we have been able to initiate home visits to our elderly patients: a doctor-nurse team visits three to four times a week, and each patient is thus checked once or twice a month. A laboratory technician was hired, with dramatic improvement in the quality of results and a reduction in public dissatisfaction.

The greatest achievement, in our opinion, has been the infusion of the staff with enthusiasm and motivation. There has been a resultant reduction in absenteeism and increased cooperation and attendance of personnel at staff meetings; the nurses' knowledge and quality of care have improved

beyond recognition, and they have been trained to practice triage. Simultaneously, there has been an improvement in their self-image and in their image in the eyes of the population, who no longer consider them merely as "ointment spreaders and injectors of penicillin." We have included the first nursing graduate from the Recanati School of Nursing in our team, and consider this a great step forward.

A well-organized consultation system exists, with specialists in most disciplines visiting the clinic on a regular basis, thus providing on-the-spot service and reducing the number of patients having to travel long distances to speciality clinics. Moreover, the gap that had existed between the family physician and the consultant was narrowing. During this 2-year period, a welcome development has been the growing cooperation between the clinic, the social service, the psychological service, the Maternal and Child Health clinics and the local authorities, up to the point of mutual involvement of the clinic in the town's affairs and vice versa. The local welfare service has provided a part-time social worker for the sole purpose of working with the clinic staff. The veteran physicians cooperated fully in the new program and participated enthusiastically in all its activities. The backup and paramedical services, as well as the counselling and consultation services, are allocated equally among all the physicians. Specialists visiting the clinic today comment on the remarkable improvement in the quality of care provided by these doctors compared with their performance prior to the Project.

Two medical secretaries were added to the staff, resulting in tremendous improvement in administration. Added benefits have been the reduction of the doctors' work load and fewer unnecessary bureaucratic demands. Regarding priorities for X-ray appointments, we received specific allocation of particular days and number of X-rays; thus, we were able to shorten the waiting period and obtain greater control over this vital service for the benefit of the patients. We organized a 24-hour emergency medical service staffed fully by the Netivot doctors. We have partially solved the problem of the poor psychosocial service, through the services of the part-time social worker who is part of the core staff. For the first time, a physiotherapy service is functioning in Netivot; the local council provides and maintains the premises, the Neighborhood Rehabilitation Project provides the equipment, and the Aguda [a joint endeavour between Kupat Holim and the Israel Joint Distribution Committee (JDC)] finances the salary of the physiotherapist.

After a long struggle, we were eventually provided with an internal telephone exchange and automatic

dialling, enormously relieving our telephone communication problem. We have introduced regular staff meetings (two to three a week), devoted to administrative and professional discussions, consultations, presentations and other academic activities for the staff. We have developed a wide range of health education activities for the population, initially through lectures and presentations, and more recently through education of health activists who are part of the community. We are thus fulfilling one of our principal goals, which was to develop the community's involvement and self-responsibility in dealing with its own health needs (5).

RESEARCH

Before commencing the Project, we defined the areas of our research: First, we wanted to define what a family physician should know in order to do a satisfactory job in the community. Such information was nonexistent in Israel prior to our Project. Second, we wanted to examine whether there is any difference between the type of physician who graduated from Beer Sheva and graduates of other schools in Israel. Third, we wished to find time, in spite of the heavy patient load, for research in the clinics. In reality, we were too busy with the day-to-day work to find time for such research, and only in one clinic was research conducted [Ben-Yair Clinic—Drs. E. Lunenfeld (6) and A. Katz spent one morning every week in research and in preventive medicine. During this time, they provided prenatal care, and Dr. Lunenfeld completed an effective screening program for risk factors in primary care clinics.] In subsequent years, following the great improvement in the quality of medical service in the clinics, the graduates devoted more time to research, resulting in programs of ongoing evaluation and research in the specific fields of community medicine.

CONCLUSIONS

The graduates' personal experience in the clinics has been extremely positive. All graduates who have participated to date have described the Project as an invaluable continuation of their medical education and a sound preparation for their continuing careers.

The *Graduates Project* has more than justified its initial expectations. Models of high-quality, comprehensive health care have been established in several areas of the Negev. New graduates of the Beer Sheva Experiment have joined with other health workers in a unique experiment of interacting with existing services toward the common goal of improving them. During the past 2 years, family medicine residents have taken over some of the positions previously held by the graduates, and it is hoped that they will become established as high-quality, committed physicians in permanent positions in these clinics. This involvement of the residents in family medicine in the *Graduates Project* is crucial to its long-term success, since it is these residents who can provide the role model that was so lacking in the clinics as well as the continuity of care that is so important in a primary care setting.

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COMMUNITY-ORIENTED PRIMARY CARE PROVIDED BY INTERNISTS AND PEDIATRICIANS — THE EXAMPLE OF YERUCHAM

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Primary health care in Israel is traditionally divided into preventive care, provided by the Ministry of Health through the Maternal and Child Health (MCH) clinics, and curative care, provided by Kupat Holim (Health Insurance Institution of the General Federation of Labor) clinics (1). In addition to the separation of preventive and curative care, there is also a dissociation between primary care and hospital medicine. The more than 1,250 Kupat Holim clinics in the country vary considerably in the range of services provided, from fully staffed clinics with many paramedical services to small clinics with a nurse and a physician who visits periodically. Rural areas present a worldwide problem in terms of medical manpower, and Israel is no exception (2). Development towns in Israel present similar problems in terms of medical manpower, even though they are primarily urban settlements (3). Perhaps they can best be compared to urban slums in Western countries.

Most of the development towns in Israel were established in the 1950s and 1960s to accommodate the large waves of immigrants and to disperse the population. One symptom of the problems in the development towns used to be the large turnover of teachers and physicians. Yerucham, the first development town in the Negev—the southern, desert part of Israel—was established in 1951. Surrounded by desert, it is located some 40 km southeast of Beer Sheva, the nearest large city. The first immigrants came from Rumania. They were followed by immigrants from North Africa (mainly Morocco and Tunisia) and a decade later by immigrants from India (*Bene Israel*) and Iran. The present population

of Yerucham is about 6,500. There is an MCH clinic in the community, and all curative care is provided by the Kupat Holim clinic, there being no other facilities in the community. There is a first aid station, which is an ambulance service. For many years, as in other development towns, the clinic suffered from a turnover in medical personnel (especially physicians), leaving the community with inadequate medical care. This chronic situation was acutely exacerbated in 1978 when Yerucham had no physician at all. At this critical juncture, a group of residents of the Department of Medicine at the Soroka Medical Center volunteered to step into the breach as a rescue operation. Their involvement was guided by health care needs as perceived by the community and by the prevailing philosophy of the Ben-Gurion University medical school in Beer Sheva. It was clear even without formal study that availability, i.e., having a physician in the clinic, was the first priority for everyone.

EVOLUTION OF THE SYSTEM

Phase I: Running a clinic by rotating residents

A group of six residents in Internal Medicine were recruited. Each resident agreed initially to serve for 2 months a year as a primary care physician in Yerucham. In addition, each resident agreed to spend one half-day a week in the clinic throughout the year, during which he would be available to a subgroup of the population who would be under his continuous care by appointment only. The attending physicians agreed to consult on a rotational basis as needed. This plan had one strength—availability. There was always a physician in the community. The plan also had one serious weakness—lack of continuity. We tried to overcome this by the intensity of the involvement on the part of the physicians, by the half-day a

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week of clinic service and by the development and obsessive maintenance of problem-oriented medical records, as well as by delegating responsibilities to the nurses and newly hired medical secretary. Our experience with this plan showed that residents kept their commitment for 2 months, and all but one repeated at least one 2-month session in the second year of the project. On the other hand, almost no one was able to consistently keep up his commitment to half a day a week because of ward duties and personnel shortages. We concluded that an extended period of rotation was preferable, but we continued the original organizational plan because that was the best we could do.

Phase II: Applying epidemiological methods to community-oriented primary care (4)

About 2 years after starting the project in Yerucham, I had the opportunity to conduct a community survey that was designed to objectively assess the medical needs of the community. This was done while Phase I was still continuing. A systematic random sample of the people over age 31 years enrolled in Kupat Holim was selected; 212 people, representing little more than $\frac{2}{3}$ of the sample, participated. Each one of them was interviewed and underwent a full medical examination plus simple tests such as hemoglobin, blood glucose, and ECG. The results were not reported in the literature, but they enabled us to plan our further work in the community. We found a poor community with 11.1% of the population supported by welfare. Large families were common with 59.3% having five or more children, and 16.7% of the men < 65 were unemployed. We found that 23.5% were hypertensive (half of them not previously identified as such), 6.6% had diabetes, 8.4% ischemic heart disease, 5.6% pulmonary disease, and 6.1% congenital or valvular heart disease. We also found that alcohol abuse was a problem in the community. We compared the medical records of those examined with those who did not come for examination and found no significant differences. We concluded therefore that our findings were representative of the population as a whole. As a direct result of this study, we were able to convince Kupat Holim as well as the Department of Social Welfare to hire a social worker who would have a joint position in both institutions and would try to solve as many social problems as possible.

Phase III: Prolonged rotation and integration of services

After almost 3 years in the community all of the residents who had initially started the project ended their residencies and continued in internal medicine

subspecialties. We extended the rotation period to 1 year of service in the community and found enough physicians who were willing to commit themselves for 1 year. Some were new immigrants, but most were graduates of the Ben-Gurion University Center for Health Sciences and Services (as part of the *Graduates Program*). The commitment of a physician in the community was for 1 year of service. This included night duties, so that the community would be covered by a physician 24 hours a day, including weekends. About half of the physicians so far have extended their initial commitment to a second year. The clinic was divided into four teams, with each team consisting of an attending physician and a resident. One team is pediatric and is responsible for children aged 0 to 10 years; the other three are primary care medicine teams.

Simultaneously, we tried to integrate services. I served in a part-time capacity as both the attending physician internist and medical director of the clinic, and at the same time part-time as an attending physician in the hospital's Department of Medicine, where patients from the community were hospitalized. I also served as a medical consultant for patients from the community on other hospital wards. In the community itself, my task was to teach and consult with other physicians and to provide a sense of continuity for the population.

In addition to the physicians' role, many services were available in the clinic—pharmacy, laboratory, physical therapy, as well as those provided by a social worker, dietician and medical secretary. We had a number of consultants who were all attending physicians in the medical center in Beer Sheva. Their specialties included obstetrics and gynecology, ear, nose and throat, dermatology, orthopedics, cardiology, psychiatry, and pediatrics. The pediatric attending physician was simultaneously the physician in charge of the MCH clinic in Yerucham, which is a unique situation, existing in only a few clinics in Israel—since there is usually total separation of preventive and curative services. There was also a dental clinic staffed by a dentist and assistants. All the physicians had joint appointments in the medical center and in the clinic (see Fig. 1 for interaction).

THE CLINIC AS A MODEL FOR COMMUNITY-ORIENTED PRIMARY CARE

Primary health care is expected to provide most of the preventive and curative services to the population. It can be individual, family oriented, community oriented (5) or all of these (6). Patients' priorities and satisfaction can be assessed by a number of attributes. These criteria vary in relative importance

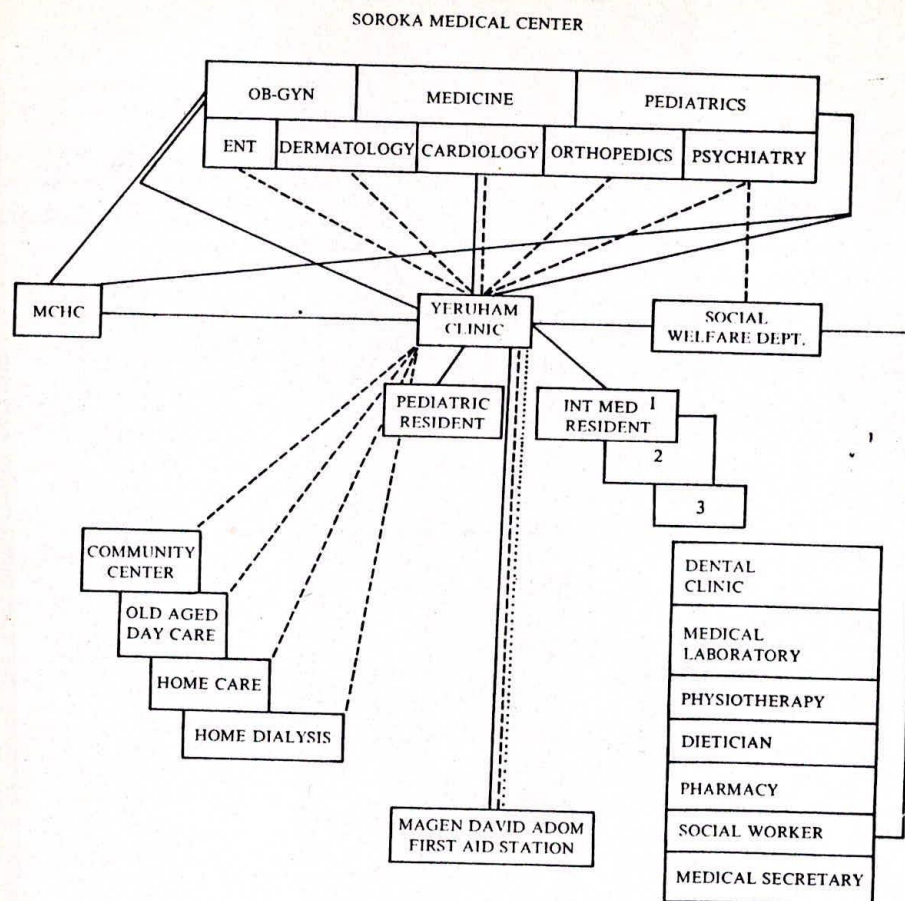


Fig. 1. Relationship of Soroka Medical Center, the University Center for Health Sciences and Services, and the allied health Services. MCHC = Maternal and Child Health clinic; — = Joint appointment; - - - = consultative service; ··· = radio communication (24 hours).

in different studies, but almost invariably they include the following: continuity of care, comprehensiveness, compassion, expertise, availability, affordability and coordination (7, 8).

If we examine the existing program in Yerucham according to the guidelines for community-oriented primary care as outlined by Kark and Kark (5) or by Fletcher et al. (8), we may see that many criteria are met. The population is composed of the entire community, and its geographic situation is very well defined. We were able to conduct a preliminary epidemiological study to identify the main problems. Subsequent studies were concerned with control of hypertension, and these subjects are continuously monitored with the help of the Department of Epidemiology and Health Sciences Evaluation of the Ben-Gurion University. The clinic is accessible and within walking distance for everyone in the community. We extended the hours of the clinic, and we have 24-hour coverage for emergencies [at least two successful resuscitations have been performed in the community, confirming the observation that the most important influence on outcome is the availa-

bility of trained personnel (9)]. Physicians, as well as other medical staff, are involved in community programs. All community committees that deal with the aged, the disabled, alcoholics and other groups include a member of the medical staff. Continuity of care over the years is assured by retaining the same attending physician. Continuity of care between community and hospital is through the involvement of the clinic physicians in the hospital care of their patients. All appointments and referrals to a specialist are done through the clinic's office and approved by the primary care physician. The care is comprehensive, and in terms of major facilities the clinic lacks only a local X-ray facility. However, some have suggested that local availability of X-ray facilities often results in considerable overuse and reliance on substandard and outdated equipment, in contrast to referral to the medical center.

CONCLUSIONS

This presentation describes the development of the current state of the Yerucham clinic, that now serves as a teaching clinic for the Ben-Gurion University

Center for Health Sciences and Services. The personnel are involved in a continuous effort to improve the services provided by the clinic. Our model, in which attending staff have dual responsibilities and joint appointments while residents assume the everyday responsibilities, provided reasonable availability and comprehensiveness. Although it suffered from a certain lack of continuity due to physician turnover, the model continues to assure quality of care. One of its major strengths is that most of the changes were achieved with relatively minor investments, making it replicable in other clinics.

In the future, solutions to two problems are urgently needed: 1) the complete integration of Kupat Holim and MCH clinics, where the obstacle is political rather than ideological, and 2) recognition by the Scientific Council of the Israel Medical Association that work in the community health center is part of a residency program—not only in family medicine, but also in internal medicine, pediatrics and other specialties.

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PIONEERING AND SETTLEMENT IN HEALTH SERVICES: A CASE STUDY

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In 1974, the newly formed University Center for Health Sciences and Services of the Ben-Gurion University of the Negev initiated a project to create a community pediatric teaching clinic in Ofakim, a development town in the northwestern Negev. In keeping with the stated goals of the institution—merging medical care and medical education (1)—the Division of Pediatrics at the Center undertook the development of the project together with the local Kupat Holim (KH) authority (Health Insurance Institution of the General Federation of Labor), which was responsible for all curative services in the town, and the Ministry of Health (MH), which was responsible for preventive services. Pediatric training in Israel is almost entirely hospital based. It was hoped that the Ofakim experiment could become a model of a community pediatric setting where trainees could gain experience in problems not seen in the hospital, with appropriate academic supervision. Before the academic personnel of the Health Sciences Center entered Ofakim, services had followed a standard model typical of most communities in Israel. KH, the major prepaid health insurance body in Israel, provided curative health services for 90% of the population through two geographically separate clinics: pediatricians in these clinics saw children up to age 12 years. MH provided antenatal and well-baby services at Maternal and Child Health (MHC) clinics, and to a lesser degree services for mental health and chronic illnesses through two family health centers situated

directly adjacent to the KH curative centers; a different staff of nurses and physicians provided services in each type of facility.

The aims of the new ambulatory pediatric project were as follows: 1) to provide high-quality pediatric care in a clinic staffed with university-affiliated pediatricians; 2) to establish a setting for undergraduate and postgraduate pediatric training; 3) to establish an effective and efficient liaison between the hospital and the community; 4) to integrate preventive and curative services and provide comprehensive primary care for the child and family; and 5) to provide a setting for the implementation of research in areas related to ambulatory pediatrics.

Studies carried out in Ofakim have demonstrated the importance of such a project for research in ambulatory pediatrics. In the clinical area, this included a study of the reliability of the middle ear examination in an ambulatory setting (2). Two studies relating to pediatric health services were carried out: one stressed the importance of the pediatric record for acute compared with chronic problems (3), and the second used emergency room utilization and hospitalizations as markers for measuring the effects of improved ambulatory pediatric services. The study showed that for the experimental clinic in Ofakim, compared with another traditional care model (4), there were 50% fewer referrals to the pediatric emergency room, with a significant increase in the percentage of these referrals requiring hospitalization—indicating that the changes introduced indeed influenced the quality of health care delivery.

The implementation of the other aims has been lengthy and complicated. Though the aims of pro-

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viding quality care, setting up a training base and establishing liaison with the hospital have been problematic, change in the service environment to allow for comprehensive child care has proved to be the biggest obstacle to success. This area is the major focus of this paper.

PIONEERING THE MODEL

The director of the pediatric service (B.P.) was appointed jointly by the director of the Department of Pediatrics at the Health Sciences Center, the regional KH director and the regional MH director. Two main avenues were open to the director of the clinic to bring about desired changes. First, he could work for change from within the service system in his capacity as director of the pediatric service; and second, he could use the new academic connection as leverage to press for change from without. Since the Dean of the medical school also functioned as regional director of all health services, and the Chairman of the Division of Pediatrics in the hospital was responsible for the health of the pediatric community of the whole Negev area, Ofakim became the first testing ground for these new community health service functions of the medical school.

Following the introduction of a senior faculty pediatrician and a pediatric resident into the clinic in 1974, all subsequent changes in the clinic were made in an effort to create a unified team to provide comprehensive care; i.e., attention to all health needs of the child by a single health team. From 1974, major organizational changes were made in order to achieve this goal, which involved changes in physical setting, role changes for existing personnel and addition of new personnel. Every change was preceded by a drawn-out process of negotiation complicated by the bureaucratic structure of health services in Israel. Change had to be negotiated within the clinic itself and with the regional supervising authorities, and certain issues required intervention of the national controlling body. The goal of integration of services further complicated the process because all levels of decision making—local, regional and national—in both health service organizations had to be involved.

At the local level, i.e., within the clinic setting itself, any change depended on the ability of the clinic director to persuade other clinic personnel. A minor modification of nursing roles or clerical procedures would be attempted this way. Clinic personnel were under no obligation to implement a change suggested by the new director; lines of authority within the system are drawn strictly within professional groupings in both the preventive and curative services. For example, the exact working conditions and obligations of nursing staff are specified in agreements drawn up at the

national level and are implemented at the local clinic by the nursing supervisor of the regional office. Thus the director has no formal authority in the clinic as a "horizontal" director of a multidisciplinary team.

The regional level, therefore, had to be involved for any type of decision requiring more than local goodwill. Changes in work schedule or hiring and firing of personnel required intervention of the regional supervisors. Although regional nursing and clerical directors could theoretically authorize change within their sectors, in practice most issues involving conflict between the sectors necessitated the intervention of the regional medical director.

In order to improve coordination both between the professional groupings and between the two institutions (MH and KH), the Combined Services Committee (CSC) was created in 1975. Members included representatives of all professional groupings within the preventive and curative services, the clinic pediatric director and the Chairman of the Division of Pediatrics. This body represented the first major effort to involve the academic and service components in the change process in primary care; specifically, this body was required to help implement horizontal change in a clinic setting. This committee subsequently became the operative arm of the Division of Health in the Community, which was established within the Health Sciences Center. At CSC meetings a "problem list" would be presented by the clinic director—problems that had not been solved through regular channels. For example, in 1976 the pediatric director persuaded the regional medical directors of both institutions to have the MH (preventive) nurses take on curative as well as preventive pediatric care. However, as control of nursing supplies remained with the KH nursing supervisor, friction rapidly developed, with the MH nurses resenting dependence on this new authority figure. Amalgamation of preventive and curative services in the KH facility in 1977 produced further tensions: selection of rooms, record storage, telephone access and even tea break arrangements, which had previously been the responsibility of the MH regional nursing supervisor, were now dependent on non-Ministry personnel. These issues, each seemingly trivial, cumulatively became a major demoralizing and dividing force. Intervention of the CSC in all such issues facilitated appropriate definition and delegation of tasks across institutional lines.

An additional factor that abetted change was the recognition of the Ofakim setting for part of the pediatric residency training in 1975. Prior to this, no primary care setting in Israel had been granted such status, except for an optional period in the MHC clinics. This recognition forced the service-providing organization to upgrade certain aspects of service, e.g., to improve

accessibility to radiological services and widen the scope and availability of laboratory services.

Important questions throughout this process of change have been: Are these changes creating a setting that will be seen as an attractive alternative career pathway by future pediatricians? And secondly, will these changes ensure long-term improvement in the overall primary care delivery system?

PROBLEM OF SETTLEMENT

The title of this paper contains the terms "pioneering" and "settlement." Pioneering is defined in Webster's dictionary as "to open or prepare for others to follow." In this case it was hoped that the Ofakim experiment would be a pioneering model for ambulatory pediatric services in Israel. As such, the Ofakim pediatric experiment has helped show pediatric trainees the changing context of pediatrics in which the hospital has a diminished role. The longitudinal management of children in the context of their families, and management of the child both in health and when ill, are new experiences made possible by the integration of preventive and curative roles. In addition, the role of the resident in following the patient in hospital has helped improve relations between the hospital and the community. Consultation by other pediatric faculty in Ofakim, and the presentation of cases from the Ofakim clinic at pediatric department meetings have done much to improve the understanding and academic credibility of ambulatory pediatrics.

However, the numerous organizational changes over a 10-year period, though some were planned as part of a process of evaluation and innovation essential to any pioneering effort, have not led to true "settlement" of ambulatory pediatrics. The Ofakim pediatric experiment has not yet established itself as a truly viable model for child health care. Three main factors have been responsible for failure of settlement (i.e., failure to consolidate): lack of commitment to change from within the service sector, conflict of interest between service providers and the academic setting, and insufficient commitment of the predominantly hospital-based academic medical center to the development of primary care models.

Given the rigid hierarchical structure of health services in Israel, change from within is always problematic. Vertical control of all sectors—physician, nursing and clerical—from the national to local levels determines all aspects of work including a detailed job description, work hours and salary. Labor unions vigilantly protect all such details within labor agreements. Consequently, people within the system who do agree to change may risk antagonizing some level in the hierarchy, with ripple effects to the related labor unions. For example, the agreement by MH nurses to

take on curative tasks, as discussed above, established a precedent for subsequent demands for increased salary and status change on a national level.

At the national level of KH and MH, the Ofakim experiment received at best *post facto* approval for changes negotiated at the regional level. No meeting ever took place between the two institutions regarding the planning and implementation of change. In other words, there was no formal institutional policy regarding change in the status quo of ideological and functional separation of the curative and preventive services.

The regional level was crucial for implementing any changes in the system. Within the KH curative services, the regional physician, nursing and administrative personnel supported the Ofakim pediatric director. A hotline to these functionaries was used to mobilize support rapidly for even minor changes that were frequently not welcomed within the clinic itself. In time they conveyed to the clinic staff that they were delegating decision making on certain issues to the pediatric director. Within the MH, responsibilities of the Ofakim pediatric director and the MH regional office were never fully defined. This lack of clarity precluded both the possibility of readily changing the functions of Ministry personnel, and effective integration of child health services.

The signs of failure of settlement have been most obvious at the local clinic level. Local personnel were not involved in any of the planning of the Ofakim experiment, but they were expected to implement decisions made at the regional level by their respective supervisors, and to cooperate with the pediatric director. Most changes in the service demanded more work from these personnel. Each change in the work routine required that the clerical staff spend more time in explanation to patients and in patient scheduling, which necessitated increased demand for telephone services.

Integration of curative and preventive services dislocated work routines and norms. Thus, for example, the workers responsible for providing tea to the additional MH staff protested the additional burden involved and required regional approval for increased funding for tea and sugar! The pharmacist complained of increased demands by the pediatric residents on rotation to alter norms not within his control, such as the frequency of prescription renewals for medications used by chronically ill patients. For the MH nurses, adoption of curative tasks was a major change in their routines. Whereas their traditional role allowed them to exercise control electively when a child appeared for immunization or consultation, they were now exposed to the problems of a socialized medical system with large numbers of

patients brought in randomly by anxious parents. Tasks such as triage, wound dressing or administration of antibiotic injections had not been practiced for many years. Such problems, together with a feeling of divided loyalties between the regional supervisors and the local pediatric director, resulted in a sense of alienation and anger within the newly integrated environment.

For the pediatricians involved in the experiment, the organizational power structure of the clinic was a new experience. Despite similar professional groupings in both the clinic and hospital ward setting (physician, nurse, clerical), the department head was always the clearly defined authority for problem solving on the ward. In the clinic and at the regional level, even a strict "physician" task, such as the decision regarding the number of patients to be seen in a session, was in fact not under the pediatrician's control. The system demanded that all patients requesting to see the pediatrician on a given day must be seen, irrespective of the availability of supporting nursing and clerical staff to share the burden. Nurses and clerks could leave the clinic at hours stipulated in their wage contracts, with the physician having to control patient flow, see all patients, and lock the clinic upon leaving! The impact of such situations on the perception of pediatric residents concerning their future roles was negative, to say the least. The result was rapid development of "burnout." With difficult patient loads, little energy was left for problem solving at the local and regional levels.

Conflict between service providers and the academic setting also impeded change. The Ofakim experiment constantly "used" the academic backing of either the division chiefs or the Dean himself to press for change. Constant pressure from these outsiders on the service providers caused antagonism at both local and regional levels. A frequent reply to requests to upgrade was: "We cannot create two levels of care—Ofakim and the rest." Academic recognition of Ofakim provided no benefits for many personnel in the system—only more work.

Finally, there was the problem of adequate academic commitment to the development of primary care models. Much of the impetus for initiating the Ofakim experiment had come from within the pediatric division of the university hospital. The division chief was always available and actively supportive of the local team. Nevertheless, the Ofakim experiment was not seen by many pediatric faculty as an important divisional and institutional priority. With heavy service loads on the pediatric wards, Ofakim was seen by some as draining manpower from the division. Sporadic visits by senior pediatric consultants or the occasional presentation of cases from Ofakim at

departmental meetings were not sufficient to establish Ofakim as a true priority of the pediatric division. Success of such a program relies heavily on acceptance by pediatric trainees, who in turn are heavily influenced by faculty attitudes and practices.

CONCLUSIONS

From a descriptive hindsight review of this kind we present suggestions for others embarking on the difficult task of integrating the academic and service components of primary care. There are few reliable guidebooks to guide the uninitiated, other than empirical efforts of this type.

Within the service, a lesson learned from the Ofakim experience has been the importance of both planning and implementing change in consultation with the local workers in the field. Planning changes at all stages without local personnel, and expecting them to then unquestioningly carry out those decisions, invites obstruction. As in all organizations, power is precious to all; most changes will threaten someone's power base, neutralizing some if not all of the possible effect of the change. Local personnel will often have greater understanding of the problems than outsiders, and they can thus contribute significantly to their solution. At the other end of the hierarchy, the higher level planners must be active in ongoing reinforcement and settlement of the program. Most changes in the system will require repeated cycles of evaluation, replanning and implementation; nothing is more demoralizing to the local team than seeing that, in addition to their not participating in decisions concerning their roles in the system, decisions once taken are not appropriately implemented.

Another important function of high-level policymaking within the health service is the allocation and prioritizing of funding. Good teaching service models will incur additional costs. Policymakers must be prepared to walk the tightrope between setting up expensive and therefore nonreplicable model services on the one hand, and being unwilling to pad and reinforce services in any way on the other hand.

Regarding the role of the medical school, the problem of commitment at the practical as well as the conceptual level has already been mentioned. In addition, the Ofakim experience has helped to highlight the need for reviewing the content of pediatric training in order to increase its relevance to primary care needs. No resident failed to comment on his inadequacies in the fields of child development and behavior, family intervention and epidemiology, to name a few.

A final conclusion relates to the problem of "burnout." Within a socialized health system such as exists in Israel, demands on health personnel, particularly the physicians, are unremitting. Little attention has

been paid to this problem, which would seem to be a logical one for service and academic people to tackle together through continuing education, group dynamics and active support activities by supervisors.

This paper has attempted to explore some of the problems inherent in bringing a pioneering effort to settlement in a health service. Briefly stated, the Ofakim experiment was one of the first major attempts of an Israeli medical school to show the community setting as an alternative locus to the hospital for high-quality health care delivery and training. Consultation and coordination at all levels within both the academic and health service provider organizations

are essential for consolidation of the changes that can move a pioneering effort to one of true settlement.

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"I offer the following tentative reactions to your far-reaching reforms of medical education at Ben-Gurion University:

You have had marked success in selecting and educating medical students who are interested more in treating individuals than diseases. The goal of 'sensitizing' students to deal with ailing individuals has been achieved.

You have gone further and taught your students to recognize and deal with sick individuals [...] within the community of which the patient is a part. That is a significant accomplishment.

You have convinced at least some of your students that family practice and primary care in a clinical system are respectable alternative models to practicing acute care in a hospital setting. That is an important advance.

I am less clear about the impact of your highly successful reforms on residency and postresidency practice patterns. Considerably more time must pass before these questions can be definitively answered. It is clear at this still early stage of the experiment that your reforms have had a significant impact on your own student body at Ben-Gurion as well as on the three other medical schools in Israel. Moreover, your reforms have provided an important model for a number of third-world nations.

MEDICAL SERVICES IN THE NEGEV

This is how I read the record of the impacts of the new medical school at Ben-Gurion University on the level of medical services in the Negev:

It seems incontrovertible that the establishment of the medical school alone made possible the expansion and improvement of Soroka Medical Center into a major regional hospital with a broad array of sophisticated services.

The placement of students, residents, and faculty (part-time) throughout the Negev surely contributed to the improvement in the range and quality of medical care in the clinics of the region. The largest gains were the expansion of specialists and subspecialist consultations.

The JDC (American Joint Distribution Committee) clinic demonstration which was aimed at new team approaches with an emphasis on family practice, on strengthening administrative procedures (appointments for patients), and on more attention to patient education (use of a telephone to obtain advice) appears from preliminary evaluations to have accomplished many, or most, of its objectives.

Nevertheless, since this is an era of constrained resources, the demonstration was not able to alter the extant clinic system which continues to be plagued by heavy patient loads, less than fully engaged physicians, and bureaucratic procedures that weigh heavily on both patients and providers."

COMMUNITY HEALTH ACTIVISTS PROGRAM: A NEW MODEL OF COMMUNITY HEALTH INVOLVEMENT

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In 1981, new graduates of the University Center for Health Sciences and Services at the Ben-Gurion University of the Negev were placed as family physicians in the only clinic serving a population of 8,000 in the development town of Netivot in southern Israel. The clinic belongs to a national prepaid health insurance scheme, Kupat Holim (Health Insurance Institution of the General Federation of Labor), which provides primary care services for approximately 80% of the population of Israel. Patients are allocated on a geographic basis to a particular physician. This community placement of graduate physicians was part of a program to raise the level of primary care services in the Negev region, the area served by the community-oriented Ben-Gurion Medical School (1). Important changes in clinic function were introduced during the initial 2 years of the program, with improvements in patient scheduling, support services and patient records (2).

The third group of physicians entering the program (about 40% of all graduates signed for a 1- or 2-year period of service in the clinic), following their initial period of adjustment in the clinic, indicated a desire to extend their role into the community. This paper describes the *Community Health Activists Program* introduced in this clinic, which has subsequently served as a prototype for similar programs

in the area. While examples of community participation in health affairs have been described (3), the nature and scope of this program seem to have unique elements.

AIMS OF THE PROGRAM

The initial aims of the program were: 1) to improve communications between the community and clinic staff; 2) to improve patient satisfaction regarding health services; 3) to improve community understanding of the health system in general, and of the clinic functions in particular; 4) to reduce overuse of clinic services by improving patient knowledge regarding when to seek medical help; and 5) to move the focus of responsibility for health from the physician to the individual, the family and the community, in keeping with the declaration of the 1978 Alma-Ata International Conference on Primary Health Care (4).

Role of the Activists in the community

The Activists were required to function as resource persons concerning issues of health and illness in the community—an intermediary role between citizens and medical personnel. In addition, they were expected to be involved in specific projects relating to health issues in the community.

METHOD OF IMPLEMENTATION

Involvement of community organizations

The program was planned to include maximal involvement of all community organizations; this invol-

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vement would include active participation in the program in addition to granting passive support. The organizations involved included: the community center, the local emergency medical service, Kupat Holim, the Ministry of Health family prevention health service, the town council, the local rabbinical authority, the social welfare department and Project Renewal—an international philanthropic program aimed at improving the quality of life in underserved areas in Israel.

Community responsibility

The program stressed the responsibility of the community itself in health matters. In a community where passive acceptance was the norm, with the doctor being omnipotent in all health-related decisions, the Activists program emphasized the role of the individual in deciding matters of policy and implementation of health services in the community. Training the Activists was a means of pointing the health services toward consideration of the needs, and it stressed a realistic goal-oriented approach.

Creation of a clear framework for activity

An atmosphere of earnestness was an important initial goal for the course organizers; the course had to be seen as a serious commitment, and not as an unusual source of evening entertainment. Achieving this atmosphere included a number of steps: 1) Admissions Committee: all wishing to participate in the program were required to be interviewed by a committee comprising two organizers of the program. Candidates regarded as not taking the program as a serious commitment, or who for any reason would not be able to participate fully in all course activities, were excluded. 2) A nominal fee was required, more as an indication of commitment than for any financial reasons. 3) All participants signed a form declaring their intention to attend the full 3-month course and to continue community activity within the course framework for a period of 6 months following completion of the course; 4) Written examinations (multiple-choice format) were part of each session. 5) The family physician was used as an ongoing connection between participants in the course from his practice area and the course organizers. The physicians themselves were each committed to recruiting 20 participants from their practices. 6) Punctuality was rigidly enforced. 7) For those with poor literary skills, aides were available at the sessions to help with the writing or translating of material.

Course content

The course was structured around 12 weekly evening

meetings. Each evening covered a topic seen by the participants as important for their future activist role in the community. Topics included: structure of health services, child health problems, first aid and cardiopulmonary resuscitation, use and abuse of drugs, problems of the elderly, and medicine and Jewish tradition. Members of the community were involved in the selection of course topics.

At the beginning of the course the participants were divided into groups of 8 to 10 people, these groups remaining constant throughout the course. Though some of this subdivision was arbitrary, social and religious factors were important. For example, the men attending the local Yeshiva (center for Orthodox Jewish studies) together comprised one group; this was done in order to respect their religious sensitivities concerning mixing socially with women, and to enable them to develop their particular field of interest—the relationship of traditional Jewish teachings and modern medicine.

The first part of each evening started with a pretest, with the group discussing a question related to the talk that would follow. For example, in the area of child health, groups would receive short vignettes of common pediatric problems, such as: a 6-month old baby has a fever of 38.5 C, frequent loose stools, and vomiting all foods. The group would discuss and present their opinions as to what treatment should be given, when medical help should be sought, and what the probable diagnosis is. Following the presentation of each group's summary, the main lecture was presented. The preceding group problem discussions actively involved the participants in the educational format and helped the lecturer in focusing his presentation. When possible, the pretest questions were prepared by the lecturer himself.

In addition to the weekly topic, help was given to participants in the choice of specific community projects that they would implement as part of their practical work in the community at the end of the didactic part of the course. Some of the projects involved practical application of the learned material, e.g., practicing resuscitation procedures on models, or demonstration of first-aid techniques. The group leader would present a general plan of a project, a progress report, and specific time commitments for implementation of the project. The training team was available to advise the learners and to help translate their ideas into a practical format for implementation and ongoing evaluation.

EVALUATION

Evaluation of the success and impact of the project involves short- and long-term measures. Short-term measures include: participation and dropout during

the course, the number of new community projects initiated, "spread" of the program to other communities, and satisfaction of the participants.

Participation

To date, of a total of 173 participants who began the two courses in Netivot, 148 have completed all course requirements (85%).

Initiation of specific community projects

As part of their commitment to the program, Activists are expected to implement projects in the community after their training period. Following are examples of such projects: early detection of hypertension, early detection of breast cancer, establishment of a local branch of the Israel Diabetes Association, an assessment of the health needs of the community, a needs assessment for the aged, a household survey for excessive drug storage, and initiation of a preventive dental health program.

Spread of the program to other towns

Similar courses were started by physicians participating in the graduate program in two towns with characteristics similar to Netivot, and three further clinics not staffed by physicians in the *Graduate Program* have since run courses using the same model.

Satisfaction of participants

The low degree of attrition from the program, the number of community projects initiated, the intensity of involvement in the sessions themselves, and the eagerness to organize end-of-course parties all indicate high levels of satisfaction. Apart from minor changes in course content for the second course, no requests were made for change in format, with graduates of the first course taking full responsibility for the planning and implementation of the second course. In addition, the personal participation of all clinic staff members (including nursing, clerical, and pharmacy personnel) in the initial course indicated very high staff satisfaction with the program.

Public recognition of the program

The program was granted an award for distinguished volunteerism by the President of Israel at a national ceremony in 1985. This highly regarded award is an indication of the significance attached to the work of the Activists and of the high regard in which the program is held.

DISCUSSION

The *Community Health Activists Program* was not initiated as a simple attempt to improve health

education in the community. For many years prior to the inclusion of the Netivot Clinic within the Project for Improvement of Health and Social Services in the Negev, the community had been served by poorly trained physicians, and there was much dissatisfaction. The first years of the project, while bringing well-trained graduates of a progressive community-oriented medical school to the town, were still accompanied by voices of suspicion and dissatisfaction. Some community members claimed that the project used newly graduated physicians to "experiment" on the population; there was also a demand that pediatricians have primary responsibility for the children, instead of the family practice model used in the clinic. A system introduced by the graduates to schedule appointments for patients instead of seeing them on a first come first served basis was seen by some as an effort by the new physicians to give themselves an easy time!

The Activists program was seen by the organizers as a way to improve the relationship between the community and its health providers. The group of young physicians saw that despite the changes in basic structure and function of health services that had been introduced by previous physicians in the program, there had been no real input from or dialogue with the community itself. They rapidly perceived that a traditional physician-patient health education model was not sufficient, and that families and communities must have a greater role in deciding on their health priorities. Course organization followed the principles laid down by Standard and Kaplun (5), where the emphasis of health education is shifted "from a focus on particular behaviors, to one that takes into account the general life-style of a person—which in turn is influenced by that of the family, community and country."

Though not systematically evaluated by the team organizers, it was felt strongly that no single component of the Activists program was responsible for its acceptability; rather, a combination of factors seemed to contribute to the creation of a viable and replicable "package." This package included a careful definition of the commitment of the providers and participants, involvement of all health-related community bodies and, probably most important, stressing and supporting the role of each individual as a critical link in a community effort.

In analyzing the success of the program, attention must be paid to the milieu in which the program was carried out. Little opportunity exists in a community such as Netivot for self-expression other than

concerning religious or political affairs. In addition, apart from the general conservative nature of the community, there are many subgroupings based on sex, age, ethnic background or specific religious affiliations, to name only a few. The program organizers were challenged to present a framework that could appeal to all groups and would enable them to express their wishes actively within it. In a setting where passivity characterized the relationship to services, this transference of mastery to the community indicated a significant change in behavior.

Considering the initial evaluation, the ongoing activity of the course and the community projects indicate important continuing motivation of the community to succeed. Ongoing evaluation will concentrate on outcome measures, such as changes in health status and health-related behavior. Descriptions in the literature have documented the impact of education programs on health behavior, such as the one carried out to reduce physician visits for the common cold in a family practice setting in Columbia, MO, USA (6); however, there is little evidence regarding the replicability of such a program to the community described in this paper. Impressive health outcomes have been described, for example, in a health education program via

intermediary "Care groups" in a developing community in Gazankulu in Southern Africa (7), with an impressive reduction in the prevalence of cholera after introduction of the program. However, changes of such magnitude are far more difficult to achieve in a community such as Netivot, which has a more Westernized health status. More sophisticated monitoring of the behavior of patients with chronic diseases, such as diabetes and hypertension, is under way, and other outcome measures will require development in the future.

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THE NEGEV PRIMARY CARE PROJECT: PRACTICAL CONTINUATION OF THE BEER SHEVA EXPERIMENT IN MEDICAL EDUCATION

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The University Center for Health Sciences and Services (UCHSS) of the Ben-Gurion University of the Negev has attempted to change the orientation of both medical education and the provision of health services in Israel. Much of this innovation has come about through involvement of the medical school curriculum in the community, using primary care clinics, schools, old-age homes and other community-based organizations as appropriate settings for more relevant medical education. This educational reform was seen as part of a broader program for closing the gaps between medical education and the delivery of health care, as described by Prywes (1). The original goals of the UCHSS at Ben-Gurion University stressed, firstly, utilizing academic resources to develop a comprehensive community health care program for the region, and secondly, educating a new type of health worker with the motivation and competencies to function effectively in the system. This paper describes a project established to implement the institutional goals of the UCHSS.

THE PROJECT

In 1979, with the aim of improving primary health care in the region, the UCHSS entered into a collaborative experiment together with the major health provider in the area, Kupat Holim (Health Insu-

rance Institution of the General Federation of Labor), and a philanthropic organization, the Joint Distribution Committee (JDC). The JDC agreed to finance positions not provided by Kupat Holim, such as social workers, health educationists and medical secretaries, as well as improved on-site laboratory and record-keeping facilities. These were felt to be the essential components of a good health service, which could influence the Beer Sheva graduate in choosing between a hospital-based career or one in primary care. During medical school exposure in primary care settings, the students had identified sources of frustration relating to primary care practice: namely, distance of clinics from the medical center, long waits for laboratory and X-ray tests, poor quality records, no on-site availability of reference material, and—most important—the lack of peer support.

The general objectives of the project were:

- 1) To develop, demonstrate and evaluate comprehensive systems of delivery of health and social services in varied community settings in the Negev, based on better utilization and upgrading of existing services;
- 2) To develop the health and social manpower necessary for the establishment and future expansion of these programs;
- 3) To use new models of primary health and social welfare services as a basis for the future education of professionals in multiple health disciplines, focused on community and primary health care;
- 4) To utilize the knowledge gained in the successful models for the future development of national policy

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with respect to education of health and social welfare professionals and delivery of health services in Israel.

The project would provide the resources for developing a number of high-quality community laboratories aimed at improving primary care delivery and attracting new graduates. It would also redirect resources from the hospital to the community, and would hopefully address some pressing health care issues, such as excessive hospitalization rates and overutilization of hospital services, overutilization of primary care services, patient and provider dissatisfaction and physician "burnout."

During the 6 years of the project's existence, there have been four stages of development; each stage grew out of a continuing process of evaluation, re-statement of priorities and reevaluation.

Stage 1: Establishment of model clinics

This stage involved the upgrading of four clinics in order to create a small number of "ideal" primary care settings that would attract the new type of physician graduate. This upgrading involved primarily the addition of personnel as mentioned above. A medical social worker was introduced as a core member of the primary care team to help manage a wide range of psychosocial problems presenting in the primary care setting. Previously, social workers had been available only through the local welfare agency, with emphasis more on their role in providing economic assistance than in health promotion.

Medical secretaries were introduced to improve direct clerical support to the physician. Traditionally, the role of clerical staff centered on fee collection and general clinic organization, with no specific definition of a role in directly assisting the physician. The new role included patient rescheduling, communication with hospitals and laboratories, and chart conversion to a problem-oriented format. Improved local laboratory facilities involved provision of a laboratory technician and basic laboratory equipment in each clinic, as well as improving the speed at which other tests could be performed and their results provided to the clinic. Clinic libraries included basic textbooks and two journals relevant to primary care. Improvement of the record-keeping system involved supplying an improved format for records, which would be larger and more durable than traditional records, and training the secretaries in maintenance of problem-oriented records.

Stage 2: The Graduates Program

Following evaluation of the first stage after 2 years of the project, a decision was made to introduce graduates of the medical school into 10 clinics. It was

realized that a focus on the *quality* of physician manpower was needed. In the absence of sufficient primary care role models among the existing medical staff in the clinics, it was hoped that by using these graduates as more active agents of change, the desired changes in the system would occur more rapidly. The graduates were thus offered the opportunity to put into practice some of the ideals to which they had been exposed for 6 years and to play a key role in a health care "revolution." In addition to the changes in the clinics mentioned above, the graduates were promised attention to their academic needs through a weekly continuing education program and regular on-site consultation by hospital subspecialists. To make the program attractive in more practical terms, the graduates were offered a stipend for medical studies and preferential acceptance to residency programs, particularly family practice, upon completion of a year of service within the project.

The continuing education program was concentrated in a single day per week, with different activities. Firstly, lectures and seminar activities relating to common problems from their primary care experience were conducted with faculty members. Thus topics extensively covered in their undergraduate experience, such as diabetes, hypertension or depression, would be presented with an emphasis on the management of these problems in primary care settings. Secondly, interviewing skills would be reviewed through discussion of tapes from on-site encounters in their clinics. Thirdly, some of the groups requested intensive work in a group format to help them deal with their problems as individuals and as a group in these primary care settings. These sessions included a psychologist with extensive experience in group dynamics and the project director, a senior pediatric faculty member who had spent many years as a primary care physician in similar settings to those in which the graduates were working. Fourthly, time would be spent in subspecialty outpatient clinics, such as dermatology or orthopedics, areas in which the graduates felt deficient. Lastly, an important component of this day was a session devoted to discussion of specific problems related to the physicians functioning in the system. At this session the project director could list problems requiring his intervention at higher levels within the system, such as poor-quality administrative help or an excessive patient load. In addition, the opportunity to see the problems as common to all the clinics seemed to help the physicians in their adjustment to the world of primary care. A more detailed account of this program appears elsewhere in this issue (2).

Stage 3: Community outreach

Two years after the introduction of graduates into the clinics, a number of specific community-oriented projects were selected to direct the emphasis of health care from the clinic to the community. Examples included a *Community Health Activists* program described in detail elsewhere in this issue (3), an oral rehydration program and a program for rehabilitation of handicapped adults in the community.

Stage 4: Consolidation of primary care clinic models

This stage of the program centered on lessons learned concerning problems of process in health care delivery. Whereas in the early years of the program the emphasis was on structure, of both personnel and facilities, now more emphasis could be placed on the functioning of the clinic. Unforeseen professional and political conflicts had reached some resolution. These included the conflict between physicians and administrators over the responsibility for supervision of the medical secretaries, and between nurses and health educationists over responsibility for health education.

An important addition to the project at this stage was support for community-oriented research. Energy and resources could now be directed to needs of the community, instead of to needs of the clinic setting alone, through research projects initiated by the clinic teams in collaboration with medical school faculty.

EVALUATION

Evaluation of the Negev project has focused on the two principal goals of the project, which are inti-

mately associated with the institutional goals of the UCHSS: improving the level of primary health services and training a physician who will both be able, and *want* to practice primary care. Though a period of 6 years is still early to definitively determine the impact of various aspects of the program, it does allow for some conclusions. Even before describing the lessons learned, the dynamic environment in which the experiment took place must be stressed. In 1979 few could foresee the crises awaiting medical care in Israel—i.e., the general economic crisis straining resources throughout the system, and a surplus of physicians within the system. Thus, service by a graduate in a development town clinic in 1981 was a true pioneering act due to lack of manpower in these areas, whereas today many positions in primary care in Israel might have multiple applicants.

Impact of the project on the health services

A list of changes implemented in all the project clinics is presented in Table 1. Though some of these changes might have taken place spontaneously, there is little doubt that the "mass" effect of the project was a significant force. For example, institution of a scheduled appointment system for patients had been virtually unknown in these clinics. Following the overnight decision of a group of graduates in one of the clinics to introduce scheduling of patients, the snowball effect was rapid. In a highly centralized health system such as Kupat Holim, where changes of any sort often require a long period to filter through the system, the ability of the graduates to expedite the process was impressive. This effect was

Table 1. *Impact of Ben-Gurion University medical graduates on primary health services in the Negev*

Area	Before	After
Teamwork	Doctor-nurse	Doctor-nurse, medical secretary, social worker, nutritionist, health educator
Triage	None	Effective use of nurses for triage
Work hours	Split shifts	Uninterrupted, sometimes 24 hours
Scheduling system	Walk-in basis	Appointment system
Academic activities	None	Journal club, case consultation with visiting experts
Communication with hospital	Minimal	Active consultation by phone and improved flow of patients
Quality of care	Mediocre standards	Reduced rate of unnecessary referrals, better evaluation of patients in primary setting
Satisfaction	Low for patients and doctors	High satisfaction of patients, graduates and providers
Outreach programs	None	Lectures in the community, Community Health Activists Program

most notable in those clinics where the staff was comprised mainly of graduates; in clinics where most of the personnel were unchanged, the process of change was much slower. Another area of significant impact was on the hospital-community relationship. The new graduates demanded a new type of relationship between the hospital and the community physician. They did not accept inadequate responses to their referrals to the emergency or outpatient departments, failure to send a letter back to the referring physician, or "take over" of the patient by a subspecialty clinic.

The area of outreach programs deserves special mention. A *Community Health Activists* program, which was initiated by three graduates working in a project clinic, aimed at shifting the focus of responsibility for health from the provider to the community and at improving liaison between providers and consumers. In a community where passivity had characterized health behavior, this move towards health activism was a new phenomenon. This program has subsequently been adopted by clinics in a number of towns in the Negev and throughout Israel (3). Other outreach programs have related directly to perceived health needs. In Rahat, an urban Bedouin community, an intensive program to encourage early oral rehydration for infantile gastroenteritis was introduced. A health worker with no formal medical training was attached to the health team to specifically instruct mothers in the preparation and administration of the oral rehydration solution (ORS), including follow-up for weighing and reintroduction of the regular diet. A 90% compliance rate for return visits was one of the preliminary results of this program. In addition, the program further generated a demand for educating families about gastroenteritis within the community, and doctors and nurses gave lectures in all the high schools on the subject. The success of the program resulted in the local council hiring an experienced health educationist to develop a program directed at the mother in her home within the community.

In another town, in response to a need perceived by the graduate physicians and the social worker, a program for the rehabilitation of adults with a wide variety of handicaps was established in the form of a sheltered workshop. Subsequently, significant decreases in demands for health services from this population were reported.

Impact of the project on the educational process

Of the first four graduating classes of the UCHSS, 55 (49%) volunteered for the program. As part of an in-depth evaluation of this specific aspect of the Negev project, 25 participants were interviewed to assess

their reasons for entering the project, and the impact of the project on their careers. The results showed that graduates participated in the project for several reasons: 1) they wanted a longer exposure to primary care than was provided by their medical education in order to make a more informed choice of future specialization; 2) they wanted to test their skills by working independently before beginning formal specialization; 3) they felt a sense of obligation to the medical school and its special mission of community service; and (for a minority) 4) they saw the project as a means of securing residency placement.

At the end of the service in the project, most graduates indicated their desire to be involved somehow in primary care in their future careers; many of them have chosen internal medicine and pediatrics as their specialties, with a clear demand of those responsible for medical education to increase the primary care content in these fields. Regarding family practice, of 11 graduates who have entered the field since inception of the medical school, 10 had participated in the project; at the same time, family practice was still seen as having to prove itself as a fulfilling, full-time career goal.

The project has also provided valuable feedback for planners of the undergraduate curriculum in primary care. The specific undergraduate course material taught in subspecialty areas, such as dermatology and orthopedics, was frequently found not to be relevant to the types of problems presenting in primary care settings. Moreover, health services administration, interviewing technique and family therapy are just a few of the other topics either missing or understressed in training. "Burnout" has been felt by many participants in the program, with implications for both the academic and service sectors.

CONCLUSIONS

The JDC project combined health service providers and an academic setting in a unique experiment to change the health care delivery system. Despite demands to reduce spiralling hospital costs, transferring the focus of health care from the hospital to the community cannot take place overnight. The project, as an extension of an innovative curriculum oriented toward the needs of the community, has provided information regarding additional unmet needs for the potential primary care physician. At the same time, the project has shown that, in a complex, centralized system such as Kupat Holim, change is not simply a question of additional funds for extra staff. While the Beer Sheva medical school graduates have clearly demonstrated their ability to have a strong impact

on the system, the system is adapting slowly to satisfy their needs for continuing careers in primary care. The redirection of a system of medical education and health service provision from a technological hospital base to a community-based, holistic approach continues to present a challenge to all those interested in primary health care.

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"In an educational experiment, evaluation is necessary to identify strengths and weaknesses and to permit sensible evolution of the program. The process is frustrating, however, since what is important is difficult to measure and what is measurable is usually not important. Three foci of evaluation might be considered for Beer Sheva. The first concerns the general professional competence of graduates, measured usually by a qualifying examination and by acceptance into residency training programs. The graduates from Beer Sheva have been accepted by hospitals in other centers and their performance, assessed by supervisors in these institutions, has not revealed deficiencies. Additional evidence will come in the future from the performance of Beer Sheva graduates in national specialty examinations. The first level of evaluation, therefore, indicates that the opportunity for Beer Sheva graduates to pursue their medical career has not been jeopardized by their educational experience.

The second focus of evaluation should address the unique competence of Beer Sheva graduates in relation to the distinctive objectives of the program. Characteristics to assess include: orientation of career to primary health care and community medicine; sensitivity to social, cultural and familial factors in health; skills in the management of people and health resources; communication skills; ability to critically appraise evidence; and self-directed continuing education. In regard to some of these charac-

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teristics, it may be difficult to sort out the relative importance of the type of student admitted and the educational process after admission. There is already evidence that the Beer Sheva objectives have left their mark on the first four classes of graduates. Hospital staff in other centers note better-developed interpersonal skills in Beer Sheva graduates, for example. Great significance must be attached to the decision of more than half the graduates to volunteer for community care in the Negev, some even for 2 years.

The students are key change agents in the organization of health services in the Negev. When it comes to advocating the goals and programs at Beer Sheva, it may not be too unlike my experience as Dean at McMaster: I was not very successful, and the faculty were only moderately successful. It was the students that ended up really establishing a name for the program. They did it with the accreditation team at the beginning, and they have done it at the hospitals where their special skills have been recognized. That, to me, illustrates why the investment in the students is so extremely important.

The third focus of evaluation should assess the success of the faculty's programs in improving health standards in the Negev. Although it is still early, the role of Beer Sheva graduates in reorganizing established services to be more responsive to patient needs and supportive of practitioners is already a matter of record. Other contributions are the new programs to train community health activists, the postgraduate training of family physicians to staff Negev clinics, and the health services' research projects. There is every reason to believe that these improvements in the process will result in measurable improvements in health standards of the people of the Negev region."

AN INTERIM SUMMARY

THE BEN-GURION UNIVERSITY GRADUATE PROFILE: AN EVALUATION STUDY

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The establishment of the Ben-Gurion University Center for Health Sciences and Services (BGU) was approved by the Council for Higher Education and by the Government of Israel in 1973 on the basis of its well-defined objectives: to develop an integrated system for preventive, curative and rehabilitative care to the population of a specific region, the Negev; to merge this integrated health care system with the University Center for Health Sciences under a single authority; and to educate a physician capable and motivated to serve in an integrated hospital and community health care system (1, 2). The intention was not necessarily to train general practitioners or family physicians, but rather to provide all graduates with an orientation to comprehensive medicine. It was expected that even specialists with such training would be better consultants to primary care physicians, while graduates who choose primary care or family medicine would be better prepared for such a practice (1).

Since the establishment of the medical school in 1974, candidate selection, curriculum planning and implementation, and the learning environment have been geared toward achievement of these goals, as described in this issue of the ISRAEL JOURNAL OF MEDICAL SCIENCES. The idea was to apply special selection and training methods that would epitomize the delicate balance of science and humanism in the practice of medicine.

In 1982, one of the authors (M.P.) established the Center for Medical Education, which undertook as its major project the evaluation of the BGU gradu-

ates in order to elucidate whether BGU is fulfilling its commitment to its basic objectives. The purpose of this article is to present a preliminary report on the first five classes of BGU graduates, their career choices, self-ratings and supervisors' evaluation compared with those of other medical schools in Israel and to discuss the overall plan for evaluation of the BGU graduate. This report is the first of a series of evaluation studies that will attempt to identify the profile of the BGU graduate, to define the standards of knowledge and skills in comparison with those of graduates of other medical schools in Israel, and finally, to determine the extent to which BGU graduates have fulfilled the school's objectives and are different from other medical school graduates in their professional attitudes.

Recent literature contains only a few similar comprehensive evaluation projects performed by other medical schools. Case Western Reserve Medical School in Cleveland, OH, USA (3), McMaster Medical School in Hamilton, Ontario, Canada (4), the University of New Mexico Medical School in Albuquerque, NM, USA (5), Medical School of Maastricht, Netherlands (6) and the University of Newcastle, Australia (7) have reported similar ongoing evaluation projects of their graduates. Due to the paucity of such comparative studies, little is known of the effectiveness of programs emphasizing new approaches to teaching medicine (8).

GRADUATES OF ISRAELI MEDICAL SCHOOLS

Graduates of the BGU medical school

Of a total of 175 graduates from the first five classes, 1981-85, 105 (60%) have started their residency training, 29 (17%) serve in the army, 18 (10%) are as

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yet undecided regarding their specialty choice, 10 (6%) are enrolled in the special project of 1-year, voluntary, postgraduate primary care service in the community (the Joint Project), 8 (5%) went abroad for residency training and 5 (3%) postponed their residency training and are working in various community clinics.

Graduates of the other three medical schools in Israel

The BGU graduates of the 1981-85 classes were compared with graduates of the 1980-84 classes of the other three medical schools in Israel—in Tel Aviv (Sackler School of Medicine), Jerusalem (Hebrew University-Hadassah Medical School), and Haifa (Faculty of Medicine, Technion—Israel Institute of Technology). Of a total of 1,236 graduates, 732 (59%) have started their residency training, 192 (16%) serve in the army, 146 (12%) are not practicing medicine or are undecided about their future plans, 137 (11%) were not located, 27 (2%) went abroad for specialty training, and 2 died. Information concerning 1985 classes was not available at the time of the study.

CAREER CHOICE

In total, the study relates to 1,411 graduates from all four Israeli medical schools. The distribution by school and graduation year is presented in Table 1. The career choice of the 113 of the 175 BGU graduates (1981-85) who have started their residency training compared with the 589 of the 732 graduates of the three other medical schools who have officially declared the specialty choice (1980-84) are listed in Table 2. Career choices of BGU graduates were similar to those of the graduates of the other medical schools in Israel with small differences in internal medicine, surgery, gynecology and family medicine. (Actually, while the numbers are too small for any statistical analysis, 10% of the BGU graduates have selected family medicine vs. 7% for the other graduates—a 43% difference in favor of BGU.) In addition to the 10% of the BGU graduates who chose family medicine, there are about 10 BGU graduates

per year who enter the Joint project. Excluding those in the army, 26 of the 146 BGU graduates (17.8%) are presently in community clinics (10 in the Joint project, 5 in primary care clinics and 11 in family medicine residencies) vs. 39 of 1,044 (3.7%) from the other medical schools.

One-year postgraduate work in primary care—the Joint project

The Joint project was initiated in 1981 by the medical school and is partially supported by the Israel or American Joint Distribution Committee (9). Its purpose is 1) to expose BGU graduates to 1 year of primary care practice in the community and to expand their performance in the social dimension of medical practice before making their career choice, and 2) to introduce BGU graduates as "change agents" for improving the medical care in the Negev region. Sixty-three (42%) of the 150 graduates, excluding those in army service, of the 1981-85 classes volunteered to serve for 1 year or more in a primary care clinic, mainly in the Negev region (Table 3). The 19 graduates of the first class (1981) chose to join the Joint project. Thereafter, while the absolute number of graduates who joined the project remained unchanged, the percentage has fallen steadily.

Table 2. Career choice distribution

Career choice	BGU graduates (1981-85)		Other medical school graduates (1980-84)	
	No.	%	No.	%
Total in residency	113	100	589	100
Internal medicine ^a	33	29	189	32
Pediatrics	22	19	106	18
Surgery ^b	19	17	121	21
Gynecology and obstetrics	15	13	66	10
Family medicine	11	10	39	7
Psychiatry	4	4	27	5
Other	9	8	41	7
Total not yet in residency	62	100	647	100
Israel Defense Forces	29	47	192	30
Primary care clinics	5	8	5	1
Joint project	10	16	—	—
Do not practice, undecided, unknown or not registered	18	29	450	69
Total no. of graduates	175	—	1,236	—

^a Internal medicine includes: cardiology, neurology, oncology, hematology, endocrinology, gerontology, nephrology, pulmonology, rheumatology, and gastroenterology.

^b Surgery includes: ophthalmology, orthopedics, ear, nose and throat, urology, plastic surgery, and neurosurgery.

BGU = Ben-Gurion University Center for Health Sciences and Services.

Table 1. Distribution of Israeli medical school graduates by school and year of graduation

Year	School				Total
	Jerusalem	Tel Aviv	Haifa	Beer Sheva	
1980	81	125	71	—	277
1981	104	114	41	30	289
1982	72	107	56	28	263
1983	78	112	53	32	275
1984	71	102	49	43	265
1985	—	—	—	42	42
Total	406	560	270	175	1,411

Residency location

Residency locations of BGU graduates and the other Israeli graduates are presented in Table 4. More than

half the Tel Aviv and Haifa graduates (72 and 69% respectively) chose to remain in hospitals affiliated to their medical schools, compared with smaller percentages of Jerusalem and BGU graduates (44 and 41% respectively). It may be noted that 95% of BGU graduates are originally from other parts of Israel, an "out of town" percentage far higher than that of any other school, and that as many as 41% chose the Soroka Medical Center in Beer Sheva as their residency location. This suggests the attraction of the graduate to his/her university hospital. Ninety-three percent of BGU graduates were accepted as residents in large and medium-size university hospitals, compared with 75% of the other Israeli graduates. The remaining 7% of BGU graduates and 25% of the graduates of the other three medical schools work in small hospitals, mainly nonuniversity hospitals.

Table 3. *Ben-Gurion University graduates in the 1-Year Joint project in primary care by year of graduation*

Graduation year	Graduates in Joint project		All graduates ^a (no.)
	No.	%	
1981	19	65	29
1982	13	59	22
1983	10	34	29
1984	12	35	34
1985	9	25	36
Total	63	42	150

^a Excluding those doing military service.

Table 4. *Residency location of graduates from Ben-Gurion University (1981-85) and other Israeli medical schools (1980-84)*

Hospital	Medical school							
	Jerusalem		Tel Aviv		Haifa		Beer Sheva	
	No.	%	No.	%	No.	%	No.	%
Jerusalem								
Hadassah	90	31	6	2	3	2	8	7
Bikur Holim	20	7	1	—	—	—	—	—
Shaare Zedek	18	6	4	1	1	—	1	1
Subtotal	128	44	11	3	4	2	9	8
Tel Aviv area								
Ichilov	13	5	34	10	6	4	8	7
Beilinson	26	9	45	12	15	8	1	1
Edith Wolfson	4	1	17	5	1	—	1	1
Chaim Sheba	18	6	51	14	7	4	13	12
Assaf Harofeh	2	1	26	7	2	1	1	1
Serlin Maternity	—	—	7	2	—	—	1	1
Meir General	9	3	31	9	5	3	5	5
Kaplan	35	12	14	4	5	3	6	6
Golda (Hasharon)	3	1	31	9	6	4	1	1
Subtotal	110	38	256	72	47	27	37	35
Haifa and north								
Rambam	16	6	15	4	40	22	6	6
Lady Davis Carmel	9	3	7	2	24	14	7	7
Haifa (Rothschild)	5	2	4	1	26	15	—	—
Hillel-Jaffe	—	—	7	2	6	4	—	—
Western Galilee Regional	5	2	14	4	7	4	—	—
Central Emek	1	—	5	1	17	10	3	3
Rebecca Sieff	—	—	—	—	—	—	—	—
Government	1	—	1	—	1	—	—	—
Poriya Government	—	—	2	1	1	—	—	—
Subtotal	37	13	55	15	122	69	16	16
Beer Sheva and south								
Soroka	10	3	15	4	1	—	43	41
Barzilai	—	—	7	2	—	—	—	—
Yoseftal	—	—	—	—	1	—	—	—
Subtotal	10	3	22	6	2	1	43	41
All psychiatric	5	2	15	4	2	1	—	—
Total	288	100	359	100	177	100	105	100

RETROSPECTIVE CURRICULUM EVALUATION

Retrospective curriculum evaluation was performed using a questionnaire consisting of 15 characteristics of the BGU curriculum that were expanded with the help of Dr. Betty Mawardi of Case Western Reserve University (10), based on a 7-point scale: 1 = very important to 7 = not important. The graduates were asked to indicate retrospectively to what extent the curricular characteristics are important to them today in view of their experience. The retrospective evaluation form was given to a sample (see below in Interview of Graduates as an Evaluation Method), comprising 76 BGU graduates from the first four classes, excluding those in the army and those abroad, and responses were received from 66 of those originally approached (Table 5). The same list of 15 characteristics was given to a control group (n = 20) from the other three medical schools. Table 5 lists the rank order of importance assigned by the BGU graduates and the control group to each one of the 15 most important curricular characteristics. The five most important characteristics of the program, as perceived by the BGU graduates, are in order of importance: openness to new information, problem-solving skills, openness to change and criticism, integration of knowledge, and early clinical exposure. Other medical school or graduates are similar in their order of ranking preference except for early clinical exposure and community orienta-

tion and involvement, which are ranked higher by BGU graduates.

EVALUATION IN INTERNSHIP PERIOD

Self-evaluation

The internship program is a 1-year, rotating, compulsory program during the 7th year of the undergraduate curriculum. An Internship Self-Evaluation Survey was carried out using a 27-item questionnaire related to quality of training, reasons for selection of hospitals, supervisors and staff attitudes, work load, scientific and academic activities, development of technical skills, degree of responsibility, intern's role as teacher, and intern's professional self-image. The graduates of all four medical schools in Israel who had their rotating internship programs during 1982-83, 1983-84 and 1984-85 were asked to participate in this survey. The response rate was 528 (66%) of the 803 approached during the 3 years of the survey. The first report on the internship program of 1982-83 was published in Hebrew in *Harefuah* (11). Several questions drawn from the self-evaluation questionnaire are relevant to the BGU graduate profile.

Results of the internship survey indicate that during the internship years 1982-83, 1983-84 and 1984-85, an average of 90% of the BGU interns were offered a residency position at the hospital in which they interned, compared with an average of 80, 73, and 72% of interns from other schools. Fifty percent of BGU graduates were involved in teaching activities as shown in the 3-year survey, compared with an average of 26% of the other medical school interns. The professional self-image of the interns was investigated by the question: "How do you see your performance in comparison to other Israeli medical interns during the internship program in relation to knowledge, skills, behavior and patient relationship?" The results are presented in Table 6. The pattern of responses to this question seems to remain consistent in the 3 years of the internship surveys. Jerusalem interns feel better prepared in the area of "knowledge" (average of 54% compared with an average of 17.5% of other interns). BGU and Jerusalem interns, compared with other medical school interns, feel similarly better prepared in technical skills. As for behavior, BGU interns feel better concerning their behavior (average of 42% compared with an average of 21% of other interns). Similarly, BGU graduates feel strongly that their relationship to patients is better than that of the other graduates (average of 60% compared with an average of 24%). It is interesting to note that the lower percentages of the "better" perception in patient relationship and behavior reported by the interns from other schools support the validity of the BGU intern's professional

Table 5. Order of importance assigned to 15 curriculum characteristics by graduates from Ben-Gurion University (BGU) and a control group of graduates from the three other Israeli medical schools

Rank order ^a		Curriculum characteristics
BGU group (n = 66)	Control group (n = 20)	
1	2	Openness to new information
2	3	Development of problem-solving skills
3	1	Openness to change and criticism
4	5	Integration of knowledge
5	9	Early clinical exposure
6	4	Self-learning
7	6	Interpersonal communication
8	8	Integration of medical education and medical care
9	14	Community orientation
10	15	Community involvement
11	12	Development of "change agent" attitude
12	7	Development of research skills
13	11	Participation in curriculum planning
14	10	Leadership
15	13	Medical administration

^a 1 = most important.

self-image with regard to behavior and patient relationship.

Supervisor evaluation of interns

Based on the self-evaluation results, it was interesting to investigate how supervisors view the interns from the four medical schools on the same four aspects. A comparative pilot study of supervisors' evaluation of interns was conducted at a large hospital in Tel Aviv. This hospital was selected because it maintains a regular program of intern evaluation on an ongoing basis. The evaluation form consisted of five areas of competence: knowledge, skills, staff relationship, patient relationship, and attitude to work. Each intern was evaluated by five or six supervisors from various clinical departments. In each area of competence, interns were evaluated on a

10-point scale from 1 = low performance to 10 = high performance. During the years 1981-84, 15 BGU, 12 Jerusalem and 19 Tel Aviv graduates who took their rotating internship in this hospital were randomly chosen for evaluation. Mean and standard deviations of ratings are presented along with *F* values of the analysis of variance (ANOVA) (Table 7).

Table 7 summarizes the results obtained from the pilot study. The mean rating indicated that supervisors were using a restricted range of the scale, using only numbers 10, 9 and 8 (8, 11, 12). The direction of average rating of knowledge revealed that the BGU graduates were rated equally competent, although in the internship self-evaluation the BGU graduates may have underestimated their knowledge ability compared with that of their peers. Concerning technical skills, the BGU intern ratings were significantly

Table 6. Response regarding professional self-image among Israeli interns during the years 1983-85 (%)

Medical school	Knowledge		Skills		Behavior		Patient relationship	
	Less	Better	Less	Better	Less	Better	Less	Better
Jerusalem								
82-83	—	48	2	43	—	17	4	14
83-84	—	50	9	50	—	21	2	20
84-85	—	64	—	48	—	26	—	29
Tel Aviv								
82-83	8	11	5	24	—	14	3	29
83-84	4	19	—	28	—	28	6	24
84-85	4	15	2	22	—	25	6	34
Haifa								
82-83	—	28	7	22	—	25	—	28
83-84	—	33	—	35	—	24	—	24
84-85	—	20	3	37	—	17	3	20
Beer Sheva								
82-83	—	11	—	48	—	48	—	70
83-84	—	—	—	47	—	47	—	53
84-85	—	21	—	54	—	32	—	57

^a Less or better means that the interns rated their knowledge, skills, behavior, and patient relationships as being not as good (less) or better than that of interns in the other Israeli medical schools.

Table 7. Supervisor evaluation^a of Israeli interns during rotating internship at one large hospital in Tel Aviv 1981-84

	Medical school ^b						ANOVA <i>F</i>
	Jerusalem (n = 12)		Tel Aviv (n = 19)		Beer Sheva (n = 15)		
	Mean	SD	Mean	SD	Mean	SD	
Knowledge	8.7	0.74	8.9	0.74	9.04	0.81	NS
Skills	8.86	0.62	8.97	0.66	9.17	0.82	3.11 ^c
Staff relationship	9.15	0.53	9.26	0.60	9.39	0.60	NS
Patient relationship	9.17	0.58	9.22	0.62	9.37	1.91	NS
Attitude to work	9.00	0.71	9.22	0.67	9.35	0.85	NS

^a Each intern was evaluated by 6 to 8 supervisors from a pool of 30 supervisors.

^b The medical school in Haifa is not included due to a small sample of interns.

^c *P* = 0.05.

ANOVA = analysis of variance.

higher than those of graduates of the other medical schools. Similarly, in the categories of staff relationship and attitude to work the ratings indicated somewhat higher means for the BGU interns. When all ratings were compiled across areas of competence a one-way ANOVA indicated a significant difference among the three groups' global mean performance ($F = 3.43$; $P = 0.05$), where the BGU mean was significantly higher than those of Jerusalem and Tel Aviv interns. The restricted range of the rating requires the development of an evaluation measure that will differentiate between competent and less competent interns. The Center for Medical Education has developed a unified intern evaluation form that is currently being used for all interns in the country during the year 1985-86. Behavioral descriptions were anchored to the rating scales, thus creating a broader range. The same analysis will be performed for all interns once the data from the new evaluation form are obtained.

SUPERVISOR EVALUATION OF RESIDENTS

An evaluation form was sent to heads of departments in which 105 BGU residents are trained. The supervisors were asked to evaluate the BGU residents' clinical performance in relation to other Israeli residents in the same department. Five areas of clinical competence were rated: knowledge, skills, relationship to patients, behavior, and relationship to staff. For each area the resident was evaluated as

Table 8. Supervisors' overall performance ratings of Ben-Gurion University residents at Soroka Medical Center and at other Israeli hospitals

Ratings	Soroka		Others	
	No.	%	No.	%
Excellent	8	29	8	19
Very Good	10	35	23	52
Good	7	25	8	18
Average	1	4	3	7
Adequate	2	7	1	2
Inadequate	—	—	1	2
Total	28	100	44	100

Table 9. Distribution of supervisors' ratings in five areas of clinical performance of Ben-Gurion University residents at Soroka Medical Center and at other Israeli hospitals

	Soroka Medical Center						Other Israeli hospitals					
	Equal		Less		Better		Equal		Less		Better	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Knowledge	13	46	6	21	9	32	31	73	4	10	8	17
Skills	16	57	3	11	9	32	29	68	4	10	10	22
Relationship with patient	7	25	1	4	20	71	19	46	4	10	18	44
Behavior	9	32	2	7	17	60	22	51	6	15	15	34
Relationship with staff	14	50	—	—	14	50	27	63	5	12	11	24

better, worse or equal to other Israeli residents. The supervisors also indicated an overall rating of performance on a scale: excellent, very good, good, average, adequate, or inadequate. Of the 105 BGU residents, 72 (69%) evaluations were returned. Ratings were summarized separately for the Soroka residents and for those at the other Israeli hospitals. The distribution of overall performance rating, as shown in Table 8, indicates a somewhat higher percentage of "excellent" rating at Soroka and a significantly higher percentage of "very good" rating of residents at other Israeli hospitals. The distribution of "better," "worse" and "equal" ratings on the five areas of clinical performance (Table 9) indicates a consistent tendency of BGU residents to receive higher percentages of "better" ratings in the categories of relationship to patients and behavior compared with the knowledge and skill rating, irrespective of the hospital. However, at Soroka (the graduates' "home" hospital) these ratings are even higher (71 and 60% compared with 44 and 34%). An additional study that will include residents of other schools is being planned to validate this survey.

INTERVIEWS OF GRADUATES AS AN EVALUATION METHOD

An extensive interview was adopted from Dr. Betty Mawardi of Case Western Reserve University Medical School, as an important evaluation tool for generating a comparative graduate profile (10). Mawardi had employed a hedonergonism approach in the development of the interview. The hedonergonism theory includes the cognitive factors as well as perception, development and motivation aspects that one employs in finding satisfaction at work. The interview provides insight into aspects such as: "What provides long-term satisfaction to the person who chooses to spend his life in a medical career? Why does he select this way of life? What does he gain and what does he give up through his choice? How does the doctor exercise control over the problems he seeks to solve and what are the ways he

chooses to solve them? How does his career affect his total life style?"

Mawardi's interview questions were adjusted to the BGU medical school objectives. The questions address issues such as professional philosophy, methods of practice, professional attitudes and values, and evaluation of the medical school curriculum and its goals. The interview consists of 120 questions and an average interview takes about 2½ hours. The interviews are recorded and transcribed. Coding categories for each question are currently being developed. All the interview questions will be coded, based on the question categories.

Of the 100 BGU graduates selected for the interview study, 80 have already been interviewed. Control groups of the three study categories from the three other medical schools have been identified (see below in Studies in Progress). Trained interviewers in the Jerusalem, Tel Aviv and Haifa regions have already started interviewing the control group. Of 80 graduates in the control group, 30 have already been interviewed. As part of a series, the details of each study segment will be published as soon as it is completed.

DISCUSSION

The present study has shown that a significant number of BGU graduates have volunteered, before starting their residency training, for 1 year of primary care practice, mainly in settlements in the Negev region. This unique route has had major impact on the organization of the clinics in the Negev, as described in Ref. 12. However, there is concern about the steady decrease in the percentage of each class that volunteers for the Joint project. The causes for the decrease are manifold and are under analysis. (A reverse in this decrease has just occurred in the present graduate year—almost 50% expressed an interest in the program.) Only 10% of the graduates have chosen family medicine as their future profession. While the percentage of BGU graduates who chose family medicine is slightly higher than that at the other schools, we would have hoped for a much higher percentage. We are investigating the factors involved in the career choices, including the possibility that given the existing organizational problems in primary care clinics, the increased exposure to them during medical school may paradoxically discourage students from choosing a career in family medicine.

Another important trend that we have noticed is that of an alternate route to primary care. Of the BGU graduates, 48%, compared with 50% of the other graduates, chose internal medicine or pediatrics, which in Israel are traditionally hospital-based

specialties. However, a significant number of these future BGU internists and pediatricians have declared their stated aim of becoming primary care internists or pediatricians. This trend represents a break with the Israeli norm and may signify an attempt by these graduates to enter primary care under conditions that to them promise a higher level of such care.

In other specialization choices, BGU graduates do not differ from others. A higher percentage of BGU graduates (93%) participates in residency programs in large and medium-size hospitals compared with other Israeli graduates (75%). These findings may suggest that BGU graduates seek to work or are more readily accepted in large academic centers. Their greater interest in teaching may support this trend. When the clinical reasoning ability of BGU senior students was compared with that of Hadassah Medical School students, no significant differences were obtained, but BGU students tended to score higher on treatment and additional information skills (13).

On supervisor evaluation of BGU graduates at a single large hospital, the BGU interns were invariably rated at least as high as those from Jerusalem and Tel Aviv, with the higher global rating and the higher rating in skills achieving statistical significance. The self-evaluation questionnaire indicated that in comparison with graduates of the other schools, many more BGU graduates feel superior in the areas of patient relationships, behavior, and skills to graduates of other schools. With respect to knowledge, the BGU graduates were more modest in their self-evaluation than were two of the three other schools. Interestingly enough, in no area did a BGU graduate consider him/herself less skilled than his/her colleagues. The supervisors' evaluation confirms the previous findings of a higher percentage of better patient relationships among the BGU graduates than among others, which may be due to the supportive medical school environment at Soroka Medical Center that reinforces this type of behavior.

One may conclude from these preliminary data that, in spite of the experimental nature of the program, the BGU graduate emerges with basic knowledge and skills no less than those of conventional programs. There are suggestions that in some important areas the BGU graduate may actually be superior. In retrospective evaluation of the BGU curriculum, openness to new information, problem solving, and openness to change were rated as the most important characteristics of the program. These findings suggest that the BGU graduates believe that responsibility for the continuous learning of physicians lies within the graduates them-

selves, which coincides with the self-learning objective of the school. They recognize the dynamic aspects of the medical profession, which is manifested by openness to both new information and change. Development of problem-solving skills and early clinical exposure are viewed as important preparation for the physician's work.

Studies in progress

The specific objective of the school was to educate a physician with a balanced comprehensive approach to both professional knowledge and social responsibility. Therefore, the professional behavioral aspects of our graduate's performance and his/her sensitivity to the human side of the doctor-patient relationship has been regarded as one of the most important aspects to be evaluated. The difficulty of objectively evaluating attitudes, values, beliefs, and behavior of doctors in different social environments is well known. Evans (14) said recently in Beer Sheva that what is measurable is not important and what is important is not measurable. The few reports published in this field relate mainly to career development, career satisfaction, learning styles, problem solving, and self-evaluation of medical students, with limited comparative studies (3-5). The continuation of our evaluation study will focus on four main questions:

Are selection attributes separable from the influence of school or health settings? Differences among study categories—students accepted at BGU and stayed, accepted at BGU and went elsewhere, rejected at BGU and went elsewhere, and a random sample who did not apply at BGU—may provide some insight as to the effects of selection methods on the type and quality of practice of the graduates. Once the admission effect is separated, the role of the school and of the health delivery system in shaping the young physician may be better understood. Selection methods should be evaluated not only by the academic achievements of the student while in school but also by his/her success as a physician. It is thus quite difficult to evaluate adequately the admission processes. Four cohorts from all four medical schools in the country that graduated during the years 1981-84 comprise the study population. Geoff Norman (15) from McMaster University, Hamilton, Canada, assisted us in selecting the methods most appropriate to address the many facets of the comprehensive physician.

Is the BGU graduate's professional knowledge adequate, higher or lower than his/her colleagues at other medical schools? As it was shown, the knowledge of the BGU interns is rated equal to that of the other Israeli interns by their supervisors, but this evalua-

tion is quite subjective. This calls for continuous research during the resident years. Resources of objective data will include national and international professional examinations and comparative supervisor evaluation of residents.

Did the graduate meet the specific educational objectives defined by the program? The original objectives of the medical school reflected certain humanistic, social, and professional values. The curriculum was designed to transmit these values to the graduates. Thirteen years later we ask: are the basic values of the school retained by graduates? During the course of 13 years, the curriculum underwent a few changes and several courses were redesigned: are the basic values and philosophy of the school still retained? Since BGU graduates are scattered all over the country and work at different hospitals, research findings may throw light on the question of the extinction rate of BGU values either as a function of different health care systems or as a function of time in their professional progress in the residency years. The open-ended interview will identify the existing or changing values of our graduates as they grapple with issues of professional development.

Are the differences identified through the interviews also manifested in clinical performance? A performance study will be conducted on a random sample of graduates to ascertain whether the basic philosophy of medicine as expressed by the different study categories is also manifested in actual practice. Furthermore, along with careful documentation of graduates' individual activity, their impact on improving the health services in the region is continuously assessed.

CONCLUSIONS

This article reports various educational outcomes of a community-oriented medical school compared with traditional schools. The reported studies relate to career choice, residency location, retrospective evaluation of the curriculum, clinical reasoning competence, internship, self-, supervisor, and resident evaluation, interview of graduates, and voluntary projects. The studies in progress will ultimately provide an evaluation of an innovative medical school unique in its comprehensive approach. The present study and future studies will assist in improving the quality of medical education both in innovative and traditional medical schools.

In conclusion, it may be said quite safely that while the BGU graduates are as good as those from other medical schools, they still differ (on the basis of our limited available data) in their behavior. They are much more responsive to human aspects of medical practice, i.e., in the care of patients and their

families and in their respect of and collaboration with all health team members and colleagues in any of the medical institutions in which they work.

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AND NOW: WHAT ABOUT THE FUTURE?

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A new science, futurology, has come into being. Conferences and symposia, books and reports on futurology have become part of the current scene. This approach of the year 2000 makes this science even more meaningful. Besides marking the end of a millenium, what will happen in 2000 may directly concern many of us who are here today and will certainly affect our students and the world in which they will practice medicine. While contemporary scientific knowledge provides a basis upon which to forecast the future of technology, the future progress of science is almost unpredictable. If we knew more about the science of tomorrow, we probably would have it here today. Yet forecasting, unlike planning, does not seek to actively influence the future directly and it takes into account the entire spectrum of possible options, both objective and subjective. Thus, intuition, vision, and extravagant ideas must not be ruled out since, as in the past, they may spark off genuine breakthroughs.

Medical education is a sociocultural complex of values and interrelationships, and only partially a scientific discipline. Hence, when dealing with medical education as a mission-oriented endeavor, due consideration has to be given to the human and social implications of the scientific and technological revolution. Finally, one cannot ignore the political elements and processes that affect every nation's way of life, or the public opinion of consumers that serves as the feedback channel for its decision-making bodies. As a result, the art of prediction in health care and health education is conceptually and technically complex.

When asking ourselves what is desirable in our age of change and choice, we had better take another look at existing values. Thus, while becoming futurologists, we should not forsake history, past and present.

The 13 years of the existence of the University Center for Health Sciences (UCHS), also called "The Beer Sheva Experiment," is a far too short period of time on which to base a forecast for its future. We feel that we are on the "right track," since today some 60 medical schools all over the world in both developing and developed countries have followed in our footsteps. Moreover, some 10 old, well-established schools—led by Harvard Medical School—started in 1985 a new, parallel track ("The New Pathway"), which is philosophically based on the principles of Beer Sheva (1).

Fifteen years ago, in 1972, I was invited to deliver the closing address of the Fourth World Conference on Medical Education in Copenhagen, entitled: "A Look to the Future" (2). I made 10 predictions for the direction in which change will probably move in the future. It may be worthwhile to mention them and compare them with the reality of 1987 in Beer Sheva and in the world of medical education:

1) Viewing medical education as a social endeavor to serve growing national health needs is the first foreseeable challenge. Therefore, medical education will inevitably become more involved in shaping better health care for all. This involvement will increasingly impose on the academic medical center a new responsibility—the search for new models of health care.

2) The second challenge, a direct outcome of the first, will be to seek new, realistic approaches in relationships between academic and health service sectors. Since one system cannot survive without the

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other, both must contribute to better communications and understanding.

3) The third foreseeable change will be the extension of medical schools' educational responsibility beyond the traditional undergraduate level. This expansion will encompass a few directions: First, it will move upwards into graduate, postgraduate, and continuing education. Second, it will move within the university setting, developing an ever-growing interaction with other academic disciplines: the natural, behavioral, and social sciences, and the engineering and computer sciences. Third, we shall witness the transformation of the traditional medical school into a regional multischool medical center, providing education not only for physicians but also for a multitude of health professions, both academic and vocational.

4) A few basic changes will occur in the future medical curriculum. Firstly, the uniform curriculum structure will slowly but steadily lose its sanctified position. More and more medical schools will abandon it in favor of an increasingly flexible program that is adaptable to the needs of individual students. This will probably include different designs, like "core" and "elective" courses, multiple tracks in undergraduate education, different rates of student advancement—all leading to less rigorous frameworks and rules. Secondly, we shall witness a trend to erase the existing lines of demarcation between the traditional basic science disciplines and departments. In a parallel fashion, the teaching of sequentially arranged disciplines will disappear, and a more integrated system will come into being. Thirdly, the strict schedule of long laboratory hours, identical and obligatory for all students, will become more liberal, and more of the basic sciences will be taught in relation to patient problems. This will enhance also a better integration of behavioral sciences within the medical curriculum. Consequently, fundamental biological, behavioral, and social concepts will become more essential to the understanding of health and disease. In addition, a growing number of scientifically trained clinicians will participate in basic science teaching. Fourthly, in the clinical curriculum, more attention will be given to education in ambulatory care (primary, comprehensive care) and to work in community hospitals. This will mean much more cooperation or integrated relationships, through affiliation, between medical schools, regional and community hospitals, and community health centers and clinics. As a result, one might expect from tomorrow's doctors a renewed concern for humane considerations and a new balance between the elements of individual and community health needs.

5) As for new teaching techniques, they will continue to attract some of the teachers and students. They will, however, contribute effectively so long as they succeed in enhancing the self-learning process that must ultimately become the leading objective of any educational program. Evaluation of medical education will continue to be improved by the design of new and more scientifically based techniques and systems.

6) Much of the leadership in curriculum changes, introduction of new teaching techniques, preparation of teachers to teach, and evaluation of educational programs will become the responsibility of departments of medical education, which will be established in an increasing number of medical schools the world over.

7) Student participation will evolve into a deeper, more intellectual, and more mature factor in the shaping of the social and academic systems of medical education institutions. One outcome of the campus riots at the end of the 1960s, which we are already witnessing, is a kind of sublimation of feelings and relationships within the teacher-student community, where each group has discovered that it has a lot to learn from the other. The main challenge will be to give our students the feeling that the medical school belongs also to them, and that they, equally, belong to it.

8) Medicine will always progress along parallel lines with science and technology, and thus will become more and more specialized. This in turn will call for strong safeguards in the future to preserve the essential nature of medicine as a science and an art. In this context—and keeping in mind medicine's humane and social obligations—problems of medical ethics and morals will become one of our foremost preoccupations.

9) Medical education will become in the future more global, international and regional. Ways and means will be found leading to equivalence of medical diplomas and licensing procedures, closer cooperation of national and regional medical education associations, and better exchange of experience among them. Ultimately we shall probably all become members of a World Federation of Medical Education.

10) Freedom, experimentation, flexibility and diversity will forever remain the key forces conditioning medical education's progress and molding its future. Since medical education is a dynamic process dealing with living people, it can never achieve a static balance and stop there. Therefore, the surest forecast for the future is that tomorrow's doctors will speak again and again about "educating tomorrow's doctors."

All this I said in September 1972, when I already had in my mind the basic principles of the Beer Sheva Experiment. For me it wasn't a dream. It was rather a deep, almost religious belief in the rightness of the ideas which inspired me. These ideas seem rather simple today. Everything we now take for granted once seemed revolutionary. Often the simplest things or thoughts may become a vision. A vision may sound quite often unrealistic or utopic or even absurd. Still, a vision is realized when there is a deep feeling of social commitment—a feeling of a mission to fulfill. Medical education is a mission-oriented endeavor. It is not composed of programs, techniques or systems. It is a composition of values. These were my convictions which, in the words of Norman Cousins, are potent when they are shared. Until then, they are merely a form of daydream. It was the good fortune of the Beer Sheva ideology that enough crazy people were willing to make an Experiment out of it. The man who realizes he is a fool isn't as foolish as he thinks.

Where do we go from now?

- 1) We have to reinforce the existing achievements in all fields of our activities, in education and in health care. In the main endeavor to link medical education and medical care, we have not yet achieved a complete merging. This is our ultimate objective. In addition, we are compelled to achieve more autonomy at the regional level.
- 2) Israel may pretend that it didn't wait for year 2000 to achieve WHO's slogan "Health for All in the year 2000," as we have in Israel free access to health services for all—but this is not yet the whole story, if one keeps in mind the quality of life and freedom from disease. Beer Sheva will have to work it out.
- 3) Promoting primary care is still an unfinished business. Beer Sheva, which raised primary care and family medicine to equal partners in medical practice and education, will become more deeply involved in faculty development in this field.
- 4) We are committed to make community-based medicine more attractive and more intellectually fulfilling for the many young graduates who now enter this field of practice.
- 5) The impact of the Beer Sheva Experiment on educational and health service institutions in the country will increase in the future. We, as good leaders, will have to give up ownership of our ideas. This will be done with the help of our graduates who will act as change agents in all the institutions they work in.
- 6) Our close links with so many friends overseas—members of our foreign Visiting Faculty, visiting students from all over, the Network of Community-

Oriented Educational Institutions for Health Sciences, the Association of Medical Education in Europe (AMEE), the Association of Medical Deans in Europe (AMDE), World Federation of Medical Education (WFME), and, last but not least, the WHO regional offices and headquarters—will become stronger and more intimate. We shall enter with more vigor into collaborative programs and enterprises.

7) We shall have to increase our efforts to convince the Ministry of Health to join the UCHS not only locally, but as full-fledged partners in our institution.

8) We shall do our utmost to keep the "social system," the atmosphere, of our institution friendly, informal and honest. We shall continue to keep it fun to be a student at Beer Sheva.

9) A greater effort in the field of research—basic, clinical and epidemiological—will have to be made despite the upcoming financial limitations.

10) We shall continue our evaluation studies, keeping in mind that comprehensive evaluation procedures can stifle essential creativity and flexibility. In comparative studies (as expressed by Donald Richards of Chicago), one is trying to say he is doing the same old things better; but in fact one creates something new.

11) Good leaders are scarce, and our concern for successors will always be with us. "Good leaders know their success depends on what happens after they are gone," to quote Richards again.

While looking to the future of Beer Sheva, I remember the story about Winston Churchill. As is well known, he liked French brandy and he enjoyed it quite frequently. When he was appointed Prime Minister, he continued for a while to work out of his office at the Admiralty, which had rooms with rather high ceilings. One day, a delegation of ladies from the Salvation Army came to visit him requesting him to limit his drinking habits and give a better example to the younger generation. They said: "If we filled up this room with the boxes of brandy you drank, they would probably fill it up at least halfway." Sir Winston looked up, then looked down, and said: "So much to do, so little done."

There is a lot still to be done in Beer Sheva. We are still traveling, and it is sometimes better to travel than to arrive.

In his opening speech as Chairman of the newly established National Medical Board of Kupat Holim (Health Insurance Institution of the General Federation of Labor), our Dean, Shimon Glick, said that he is sceptically optimistic. An "oxymoron" is the jarring juxtaposition of opposites, usually an adjective

headed one way (*cruel*) modifying a noun headed the other (*kindness*).

I am a terminal optimist.

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EXCERPTS FROM THE REPORT OF THE ACADEMIC REVIEW COMMITTEE OF THE BEN-GURION UNIVERSITY—1986

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In 1986, the Ben-Gurion University of the Negev conducted an academic review of all its faculties. Each faculty was reviewed by a subcommittee of the Academic Review Committee. The subcommittee for the medical faculty reviewed written reports from every department of the faculty and spent several days in on-site visits. A brief summary of their major findings follows:

The overall impression of the subcommittee was that the Ben-Gurion University medical school, in a short period of time, "has become a world class medical school, respected for its innovative education and quality of service." It is, indeed, clearly "the jewel in the crown" of the Ben-Gurion University.

The report found "no serious concern about the quality or quantity of medical education offered. Plans are already underway to fill the few remaining curricular gaps, and the school's compulsive curricular self-examination has

produced a finely honed continuously revolving curriculum. The tension between the basic sciences, clinical, and primary care perspectives are universal, normal and healthy. No evidence was found that the curriculum is slanted. The students are well prepared for further training in their selected disciplines. The school is well renowned for its curricular innovation. Although the process is centralized within the administration, the faculty and students participate rather fully in curricular planning and evaluation."

"The admission process works. The students are by and large able. The constant scrutiny of their growth and performance is exemplary."

"Although uneven, the clinical and basic science faculty are composed by and large of teachers and investigators of high caliber."

The committee felt that "despite its meteoric rise" and the excellence of the quality and the quantity of medical education offered, "the Faculty of Health Sciences was in serious jeopardy" because of inadequate resources, inordinate teaching and clinical load, and scarcity of research funds, even of seed money. The committee recommended major efforts on the part of the University and Kupat Holim [Health Insurance Institution of the General Federation of Labor] to support the faculty's efforts in philanthropy and obtaining research grants. The committee also emphasized the need for decentralization and regionalization in order to develop successfully first class primary care facilities in the region.

Other recommendations included greater recognition and identity for the basic sciences, the development of a comprehensive organizational structure for the surgical department, and external evaluation of the effectiveness of the graduates of medical school and the creation of an advisory board to the medical school.