the behavioral sciences and other relevant disciplines. The members, however, will commit only a few days or weeks each year to the affairs of the Institute, relying on a limited support staff to provide the thread of continuity in committee activities. In certain areas of policy where sufficient data are available, these experts, gathered together from time to time, should be able to make important contributions to health policy, but in the many problem areas where data are limited, intensive ongoing study will be a prerequisite to effective policy studies. Nothing less than one or more groups of full-time policy analysts drawn from the relevant disciplines are likely to be able to carry out the necessary ongoing research and pilot field studies required to deal with the challenge that the health-care system faces in the decades to come. Guided and supported by an organization such as the Institute of Medicine, by a large and prestigious foundation, or by an independent public policy group, such fledgling analytic efforts could have reasonable assurance of a hearing in governmental circles, both regional and national. Indeed, a close relation to government planners and to others concerned with design and implementation of health policy will be essential to the group's effectiveness and could be importantly fostered by encouraging participation of decision makers in the ongoing work. Medical-school deans, public-health leaders, congressional staff, HEW officials, hospital administrators and others could be invited to work on policy problems for a few weeks, a summer or a year, thus gaining experience with a wide variety of analytic disciplines unfamiliar to most planners and administrators in the health field and at the same time enriching the ongoing work with their own expertise. The creation of a cadre of decision makers sharing a common conceptual and analytic framework would have important potential benefits for the health-care system.

It is important to recognize that there is no guarantee that such policy studies will be successful, and they must therefore be viewed as experimental. Even if the problems of funding, proper sponsorship and the assembly of high-quality staff were surmounted (no small tasks in themselves), many more difficulties remain. Recent efforts designed to deal with complex problems such as manpower retraining and compensatory education, where modern technics of policy analysis were brought to bear with great optimism, have yielded few if any striking successes.[7,8] The shortcomings of current analytic technic, the impediments to carrying out pilot field studies, the reluctance of many government officials to use the fruits of modern planning efforts, and the political barriers to program implementation have prevented many programs from reaching their hoped for goals. Given this background, we must recognize that it is quite possible that efforts such as those proposed here will also fail to improve the planning process substantially. Indeed, it has been argued that social change now occurs with such speed that solutions arrived at by careful analysis are useless because they are usually obsolete before they can be implemented.[9] Some even say that the limit on rationality as a technic for solving major social problems may now have been reached.[10]

But what is the alternative? Our present policy of "muddling through" is virtually bankrupt, and we therefore have little choice but to turn to the use of orderly processes of reason, analysis and experimentation. Since the costs would be low, and the rewards of even partial success great, there is every reason to attempt to create new mechanisms that will integrate rational health-policy analysis with the political process.

WILLIAM B. SCHWARTZ, M.D.

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MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

DIATHERMY SURVEY

The Bureau of Radiation Control, Division of Medical Care, has the responsibility for protecting the public from the hazards of exposure to radiation sources both in the healing arts and in domestic use. During the summer of 1971, the Bureau completed a pilot survey of diathermy equipment in use in the Commonwealth. Out of a total of 10,558 questionnaires mailed to hospitals, nursing homes, physical therapists, physicians and chiropractors, the Bureau received 6808 replies (Table 1).

From the Division of Medical Care, 80 Boylston St., Boston, Mass. 02116 (further information may be obtained from Gerald S. Parker, S.M., S.M.H. [telephone 727-6243]).

The Bureau then visited and questioned a selected group of users on the type of facility, the type of equipment used, the number of patients treated each month and the parts of the body most commonly treated. One of the more interesting questions concerned the training of the operators of the equipment. None of the users, with the exception of the registered physical therapists, aides and practical nurses, had received any formal training. Registered nurses, some of the practical nurses, technicians and physical therapist assistants had received on-the-job training (Table 2).

Table 1. Owners of Diathermy Equipment by Modality.

Owners	Total Questionnaires Mailed	Total Replies	Owners Using Ultra Sound	Owners Using Micro-wave	Owners Using Short-wave
Hospitals	225	125	145	43	91
Nursing homes	675	600	10	1	14
Registered physical therapists	1,350	1,317	59	26	44
Physicians	8,000	4,505	241	96	362
Chiropractors	308	259	56	5	12
Totals	10,558	6,806	511	171	523

An inquiry to the Board of Registration in Medicine elicited the information that the Commonwealth had no requirements for the use of diathermy by a physician; nor did the state medical licensure examination include any questions on diathermy.

Since the eye is the organ most sensitive to microwaves, and the gonads the next most sensitive area, the Bureau's surveyors asked questions regarding the part of the body treated. About 20 per cent of the treatments with microwave diathermy were given for the area from the neck up, and 30 per cent in the gonadal area. There is only one recorded case of bilateral cataracts that resulted from microwave diathermy.[1] The number may be greater since investigators would not ordinarily look for a cause-effect relation for cataracts from this type of treatment.

Table 2. Microwave Diathermy — Operators and Training.

Occupation	No. of Operators	Training
Physician	22	Unknown
Registered physical therapist*	68	Formal courses
Registered nurse	12	On the job
Practical nurse	2	Formal courses
	3	On the job
Technician	3	On the job
Physical-therapy assistant	4	On the job
Aid	2	Formal courses

*Of the 68 registered physical therapists, only 9 are not employed in hospitals.

Many agencies have set a limit of 10 milliwatts per square centimeter (mW/cm²) for electronic products that use microwaves.[2] This limit is for continuous exposure. The Department's survey indicated that some patients are receiving doses greater than 1000mW/cm² during the course of treatment. Investigators expressed surprise that they had not found more cases of damage caused by the overuse of diathermy units.

From the numbers recorded during the survey, the Bureau of Radiation Control made projections of the total number of treatments by modality per month in Massachusetts. It estimated that 870,000 treatments are given each month in the state. Since a number of these treatments result in a skin dose greater than 1000mW/cm², a complete study to determine whether this level is causing any biologic damage appears to be a logical follow-up to the initial survey.

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1. Carpenter R: Bilateral cataracts following microwave diathermy treatments; a case history. Presented at the International Microwave Power Institute Symposium, The Hague, Netherlands, October, 1970
2. Control of Hazards to Health from Microwave Radiation. U.S. Army Tech Bull TB Med 270; U.S. Air Force Manu AFM 161-7, December, 1965

CORRESPONDENCE

Letters to the Editor are welcomed and will be published, if found suitable, as space permits. Like other material submitted for publication, they must be typewritten *double spaced* (including references), must not exceed 1½ pages in length and will be subject to editing and possible abridgment.

FECAL HYDROXY FATTY ACIDS EXCRETION IN STEATORRHEA

To the Editor: Kim and Spritz[1] pointed out that fecal hydroxy fatty acids are remarkably increased in nonpancreatic steatorrheas but are not increased in those of pancreatic origin. According to the hypothesis of these authors, only nonesterified fatty acids are involved in hydroxy fatty acids synthesis.

Twenty children with steatorrhea caused by either celiac disease (10 patients) or cystic fibrosis (CF) (10 patients) were investigated. The latter were studied both before and during pancreatic replacement therapy. Fecal hydroxy fatty acids, as determined by gas chromatography, were significantly increased over those in 10 controls only in children with celiac disease and in those with CF during replacement therapy (Table 1).

Table 1. Fecal Hydroxy Fatty Acids (per Cent of Total Fatty Acids) in Steatorrhea Caused by Celiac Disease or CF.

Diagnosis	Hydroxy Fatty Acids*			
	Hydroxy-palmitic	Hydroxy-stearic	9,10 Dihydroxystearic	Totals
Celiac disease (Group 1)	1.3 ± 0.9	9.2 ± 1.0	1.1 ± 0.4	11.6 ± 2.3
Cystic fibrosis: With pancreatin (Group 2)	0.6 ± 0.2	5.6 ± 0.9	2.7 ± 0.5	8.9 ± 1.6
Without pancreatin (Group 3)	0.7 ± 0.3	3.3 ± 0.8	2.6 ± 0.8	6.6 ± 1.9
Controls (Group 4)	0.5 ± 0.1	2.2 ± 0.5	Absent	2.7 ± 0.6
p value:				
1 vs 4	<0.05	<0.01	—	<0.01
2 vs 4	NS†	<0.01	—	<0.01
3 vs 4	NS	NS	—	NS

*Mean ± SEM. †Not significant.

Our results are in agreement with the hypothesis of Kim and Spritz, since the intraluminal nonesterified fatty acids were much increased in celiac patients, less so in those with CF during pancreatic therapy, and minimally in patients with CF without therapy.

Using appropriate standards, we detected small quantities of some hydroxy fatty acids that have never been found by previous investigators. These were a hydroxypalmitic acid

letter on the attached article (by Bill Houk) Glaser

SAFETY OF MICROWAVE DEVICES

To the Editor: We believe that the communication from the Massachusetts Department of Public Health entitled "Diathermy Survey" (N Engl J Med 286:1058-1059, 1972) cannot be allowed to pass without comment. As a report of "fact" it is misleading and incomplete and contains conceptual errors.

The report speaks of "a limit of 10 milliwatts per square centimeter (mW/cm²) for electronic products that use microwaves" in a context of therapeutic heat modalities that bears no relation to therapeutic heat. In the first place, 10 mW/cm² is not precisely a product emission standard, but a personnel exposure level that a human subject can receive occupationally without deleterious effects over an indefinite time; 10 mW/cm² is an expression of incident whole-body radiant energy exposure for occupational safety guideline purposes, and most certainly not product emission, which requires distance from source data to be meaningful.

The fact that 1000 mW/cm² power-flux density measurements were recorded in Department surveys is meaningless in many respects. No distance, wave-form, or time data were given. In addition, the localized area of application has to be considered. Furthermore, in producing therapeutic heat, one can expect watt levels of incident radiant energy, especially in pulsed units. There is no relation between this and occupational health standards as implied.

We take no exception with the stated need for vigilance and follow-up observation of patients who have been irradiated about the head and neck or gonads with microwave diathermy. We do take exception to the case report cited as an example of a deleterious effect (cataract) produced by microwaves. This case involves a man employed as a radiation safety officer treated with diathermy who was, concurrently, on corticosteroid therapy for pain. To date there are no authenticated cases of microwave cataract in the literature due to microwave diathermy in spite of its widespread use.

Rochester, N.Y.
William M. Houk, M.D.
Sol M. Michaelson, D.V.M.
University of Rochester School of Medicine and Dentistry

The above letter was referred to the author of the article in question, who offers the following reply:

To the Editor: The study reported in our "Diathermy Survey" indicated that 10 milliwatts per square centimeter (mW/cm²) was the safe limit for continuous exposure to electronic products that use microwaves. It is surprising to find objections to this fact when this level has been accepted by many Federal and State agencies.[1] Who's objecting

The 1000 mW/cm² measurements were calculated by the Department's surveyors. There was no intention to establish a relation between any particular measurement and exposure units. Our case, simply stated, is as follows: 10 mW/cm² is considered a safe level for continuous exposure; some patients received more than 1000 mW/cm²; the full effects of 1000 mW/cm² exposure are unknown; and such effects should be investigated. We understand that "therapeutic" exposure must often exceed "safe" levels. Our concern is the apparently universal ignorance concerning the deleterious consequences of "therapeutic" exposure, particularly treatments given in a series that may have cumulative effects.

As for the reported case of cataracts produced by microwaves,[2] let us not quibble over whether it was "caused" by microwave radiation alone or by microwave radiation combined with corticosteroid therapy, as implied in Drs. Houk's and Michaelson's letter. We do not know what, if any, synergistic role corticosteroid therapy may have. It is misleading to implicate ionizing radiation by saying that the man was employed as a radiation safety officer. His film-badge records are available, and there is no indication that he received a dose of ionizing radiation that would cause cataracts.

Boston, Mass.
Gerald S. Parker, S.M., S.M.Hyg.
Department of Public Health

1. Control of Hazards to Health from Microwave Radiation. US Army Tech Bull TB Med 270. U.S. Air Force Manual AFM 161-7. December, 1965
2. Carpenter R: Bilateral cataracts following microwave diathermy treatments: a case history. Presented at the International Microwave Power Institute Symposium. The Hague, Netherlands, October, 1970

BANANA-SEAT HEMATURIA (CONT.)

To the Editor: A recent communication from Dr. John LeRoy (N Engl J Med 287:311, 1972) questioned the frequency of hematuria from trauma secondary to the poorly constructed "banana bicycle seat." I wish to relate an occurrence of gross, painless urethral bleeding relatable to the same cause.

A 17-year-old boy was seen at South Dade Community Health Center in the early morning because of the passage of heavy bright-red blood from the urethra. Urinalysis revealed all red cells and an occasional white cell. Urine culture was negative. The gross hematuria ceased spontaneously in less than 24 hours, and microscopic hematuria was demonstrable at 48 hours.

He gave a history of riding his nephew's bicycle almost continuously for the two days before the onset of the urethral bleeding. The bicycle was equipped with a narrow "banana seat." Part of the riding took place on "jumps" to imitate the exploits of well publicized motorcyclists. As pointed out in Dr. LeRoy's letter, the seat gave "support" only to the perineum during all these activities.

I imagine that the incidence of gross and microscopic hematuria secondary to these poorly designed bicycle seats is appreciable and that these seats pose a hazard. This being so (as in many other cases in which the public is threatened by devices of modern manufacturing), I should like to inquire what mechanism is presently in existence for the reporting and documenting of these hazards and the swift withdrawal of offending items from the market. And what role does American medicine play in such consumer advocacy?

Miami, Fla.
John J. Frey, M.D.
University of Miami School of Medicine

To the Editor: Regarding "Banana-Seat Hematuria" (N Engl J Med 287:311, 1972), "painless urethral bleeding requires cystourethroscopy, and is an indication for upper-urinary-tract studies, to exclude neoplastic and other pathologic lesions, before any diagnosis (however appealing) can be made. Only after a negative urologic examination would it be correct (or safe) to say, "The cause was ascertained solely from the history."

A statement of clarification regarding results of urologic examination is certainly necessary from Dr. LeRoy.

St. Cloud, Minn.
John T. Harbaugh, M.D.

OUTPATIENT CARE OF DIABETIC PATIENTS

To the Editor: I read with great interest the article by Miller and Goldstein (N Engl J Med 286:1388-1391, 1972) describing a picture similar to the experience of the family practice unit at St. Joseph's Hospital in Syracuse, New York, where I served a year of residency with a mainly low-income practice. Our patients had individual family doctors for a year, and one of the group was on call on nights and weekends. We noted that our patients frequently took advantage of the telephone service, that they showed up at the emergency room much less frequently in comparison to general clinic patients and that a very high percentage of their visits were for problems that we considered appropriate for emergency-room treatment. In comparison with the general clinics, we also noted a lower rate of outpatient visits for care. Do the authors have any data on the number of outpatient visits made before and after the implementation of [illegible] changes [illegible] in structure [illegible] clinic as well that might also have contributed to an improved health status? Especially, were additional screening, preventive or educational programs implemented and was any change made in coordination with community agencies (such as public-health nurses)?

Oklahoma City, Okla.
Thomas B. Eschen, M.D.
Community Health Project, Incorporated