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ABSTRACT

The purposes of this project were to develop a profile of the individual physician's practice, test the physician in the major areas of his practice, and provide educational consultation according to practice profile and test results. A test bank of 1,800 5-option multiple choice questions was classified into 18 categories based on classification of diseases, with three levels of sophistication represented in each category. Questions from about five categories were randomly selected for each of 37 participating physicians. Each physician's categories were determined from his practice profile, which was determined in a week of observation by a medical secretary. The resulting data were used by educational consultants, who met with the individual physicians to plan educational programs to meet their needs. The project fund that the procedure holds potential as an aid in educational planning by highly motivated physicians, but cautions that it is too narrow to be useful in evaluating physician performance. Also, the test bank, although useful in principle, will require modification before it will succeed in practice. (BH)

Final Report

Contract Title: "Conduct a Feasibility Study in Determining Individual Practice Profiles of Physicians as a Basis for Continuing Education of These Physicians Utilizing a Postgraduate Preceptor Technique."

Contractor: University of Wisconsin
Madison, Wisconsin

Contract Number: NIH 70-4008
(Formerly PH 108-68-11)

Submitted By: Thomas Meyer, M.D.

I. Proposal

A major problem facing those responsible for the continuing education of physicians is identification of educational needs, so that program planning can be responsive to the requirements of practicing physicians. Consideration of this problem at the University of Wisconsin led to the thesis that medical practices vary greatly, and consequently educational needs must be identified in terms of the individual practitioner.

To explore this concept, a research project was designed to:

1. Gather data to develop a profile of a physician's practice.
2. Test the physician in the major areas of his practice.
3. Provide educational consultation relevant to his practice profile and test results.

The research was conducted under contract no. NIH 70-4008 with the Continuing Education Branch, Division of Physician Manpower, Bureau of Health Professions Education and Manpower Training, National Institutes of Health.

II. Methodology

Obtaining Participants

In April of 1968 the principal investigator presented the goals and procedures of the study at a series of regional continuing

education meetings in Wisconsin and invited physicians to take part. In addition, a number of telephone contacts were made with physicians who had been generally supportive of departmental programs in the past. Although difficulty in recruiting participants was anticipated, little persuasion was required and a number of participants were volunteers who had learned of the study from colleagues.

As a result, 37 private practitioners took part in the project. The distribution was 28 in general practice, four in internal medicine, four pediatrics and one surgery. University Child Health Service (UCHS) asked to be included and two staff pediatricians participated. Of the private practitioners, 36 were from Wisconsin and one from Iowa. Data on the 37 participants is presented in Table 1. (Individuals will be represented by code numbers in all data presentations to preserve anonymity).

Development of Test Bank

In anticipation of the study, collection of test questions from a variety of sources began months in advance. Selection was restricted primarily to five-option multiple choice items, although some variation in the number of options was allowed. A test bank of approximately 1,800 items was developed for the study.

The items were then classified in 18 categories (see Table 2). Seventeen categories were based generally on the International Classification of Diseases, Adapted. Category 18 was included for those physicians who saw a large number of patients with hypertension within Category 6, Diseases of the Circulatory System.

Each item was then assigned a level of sophistication, depending on whether the information presented in the question pertained to:

Level 1 - a common clinical situation and "on the spot" decision.

Level 2 - a decision requiring commonly available diagnostic tools and procedures.

Level 3 - a problem or technique requiring special knowledge or training.

In each category two questions were selected at each level, so there would be a total of six standard questions to be asked of a participant who qualified for testing in that category.

The test items were converted to an ALGOL format usable by the Burroughs B5500 computer.

Collection of Practice Data

In order to obtain data on the physician's practice a medical secretary was sent to his office for a period of one week. During this time she recorded nine items of information on each patient contact (See Table 3 for types of information recorded). Data was normally collected from Monday through Thursday, resulting in three or four days' data depending on whether the physician had a day off during that period. All patient contacts were recorded, whether they occurred in the office hospital, home, or over the telephone.

From this data recording form, it was possible to determine certain characteristics of a physician's practice. These are presented in Table 4.

The most important information on the data recording form for the purposes of this study was the column on diagnosis or tentative diagnosis. From the information recorded, the medical secretary was able to assign each patient contact to one or more of the 18 categories in the classification system. From the cumulative totals a profile was generated, based on the percentage of practice in each category during the recording period. (See Table 5).

Experimentation was carried out on alternate methods of determining a physician's practice profile. In 15 instances the physician was asked on the first morning to predict his profile. This was later compared with his recorded practice profile. (See Table 6). A second experiment involved sending a dictating machine to the physician rather than having the medical secretary visit his office. One physician dictated patient data during the recording period and his profile was derived from the transcribed tapes.

Test Administration

Based on experiments conducted early in the contract period, it was determined that a 100 item multiple choice test would require about two hours when administered by teletype. A formula was devised on this parameter to design an individualized test for each physician based on his practice profile.

A conclusion was reached that it was not feasible to test in all 18 categories within the two-hour, 100 item limit set, because the number of questions in those categories which constituted a low percentage of the practice would be too few to be of value. Therefore,

the test was devised to cover from 4-6 of the categories making up the greatest percentage of the practice profile. In each category the six standard questions (two at each level of sophistication) would be assigned, and then an additional block of five questions for each five percentage points of practice would be randomly selected by the computer. In each block of five random questions there was one from level 1 and two each from levels 2 and 3. A maximum of 36 questions was allowable in any one category. Table 7 is an example of how a test was composed from one practice profile.

Since the random selection of items, other than the standard questions, was based on the unique code number assigned to the physician, all participants could be assured that no two tests would be identical. This prohibits test score comparisons among themselves or with any outside group.

The test was administered over a portable teletype by telephone communications between the physician's office and the University of Wisconsin Computer Center. The items were presented by category, giving the physician the option of resting between categories. The question and the five options were printed out at the teletype terminal, the physician responded by selecting one of the options. This brought an immediate response from the computer which informed him if he had answered correctly or if wrong, the option he should have selected. At the conclusion he received a summary of the results. The physician retained the teletype print-out for his analysis.

Educational Consultation

An educational consultant, either from the full-time or clinical faculty of the University of Wisconsin Medical Center, was assigned to each participant. Selection was made in advance of profiling and testing with an attempt to anticipate the medical specialist who would correlate with the practitioner's needs. This consultant was furnished a complete set of the patient data with a statistical analysis of the data as well as a computer print-out of the test and brief analysis of the results.

He was then asked to visit the practicing physician and discuss these with him. Utilizing the patient data, test results, physician's comments, and information on his practice setting and procedures, the consultant and physician would jointly arrive at an educational program covering the next six to nine months. The educational consultant was asked to develop a relationship with the physician, to continue throughout the study period, with the Department of Postgraduate Medical Education serving as a resource and coordinator, to assist as desired.

The consultants were encouraged to suggest a variety of continuing education activities to meet identified needs, e.g. appropriate journal references or reprints, attendance at postgraduate courses, visits by faculty members to the participant's office or hospital on a periodic basis, study programs at the University of Wisconsin Hospitals or other appropriate medical centers, etc. An honorarium of $200 was provided to the physician to cover expenses involved in carrying out the educational program.

Evaluation

Re-profiling and re-testing were planned as a form of program

evaluation. Four physicians were re-profiled six months after the initial profile was taken. Five physicians were re-tested, two on the basis of the re-profiles and three on their initial profiles.

In addition, a day-long meeting was held in May of 1969 where participating physicians, consultants and staff members discussed the procedures, results and future directions of the study.

III. Discussion

Obtaining Participants

The ease with which participants were recruited was encouraging. However, it must be pointed out that the 37 involved represent a biased sample. They were a highly motivated group, already participating actively in continuing education activities, and considered to be secure in the quality of medical care they were providing. It is significant that virtually all have expressed a desire to be included in any continuation of the study, and five other physicians have contacted the principal investigator asking to be enrolled.

Equally encouraging is the fact that the participants became deeply involved in the total project and were not restricted to providing the "laboratory" in which the study was conducted. Their role at the conclusion of the study period is more that of co-investigators than participants.

Development of Test Bank

Limitations in the scope and structure of the test bank became apparent early in the study. Thirteen of the participants were asked to immediately review their test print-outs and designate

those questions which were not relevant to their practices. While this is not a completely objective method of determining relevance, the fact that their success in answering questions correctly did not seem to affect their judgments added to the credibility of the process. In all, one-third of the test questions were termed inappropriate. In terms of efficiency alone, this meant that 40 minutes of each two hour test were essentially wasted in relation to the goals of the study. Analysis of the reasons for irrelevancy led to two procedural problems:

1. Classification of the test questions into 18 categories was not sufficiently sensitive to insure that a physician would be questioned on his practice profile. For example, a physician who saw a number of patients with allergies might find himself questioned in depth on metabolic problems, since they are both included in category 3.

2. Questions are written from an academic viewpoint, and consequently the format of the question may make it inappropriate for testing a clinician. One example which occurred was an item which involved incidence of a specific condition and the options were in increments of five percentage points. The clinician's response was that his clinical decisions would be influenced by whether the incidence was high or low, and the fact that he could not specify it within a few percentage points was not important.

Collection of Practice Data

The procedure and form developed for collecting practice data proved successful. The medical secretary found she was unable

to record time spent with the patient, and some physicians had a significantly higher percentage of undiagnosed patients than others due to a reluctance to make a tentative diagnosis on the first patient visit before any test results were available. In all other categories she found it possible to gather the desired data with little difficulty.

The data confirmed that medical practices do vary greatly in such matters as patient load, method of patient contact and types of diseases and conditions which bring patients to the physician (See Tables 4, 5).

One weakness of the procedure involves the key item in development of the profile, the tentative diagnosis. If it is an incorrect diagnosis, it is still reflected in the profile. While effort could be made to confirm the initial diagnosis by a later check of the patient record, this is not felt to be warranted in terms of the potential improvement of the data.

The major problem involved in the data collection procedure is the conclusion by the participants that review of a practice for 3-4 consecutive days does not present a true practice profile. The only data available involves the four physicians who were re-profiled after six months. Changes in almost all categories were less than five per cent, and the profiles showed little variation. Those changes detected involved a higher incidence of category 7, diseases of the respiratory system, in the November profiles and a higher incidence of category 1, infective and parasitic diseases, and category 5, diseases of the nervous system and sense organs, in the

May profiles. Since this is such a small sample, and the participants feel quite strongly that variation does occur, effort should be made to collect sample data over an expanded period to determine if this presents a more accurate practice profile.

The one attempt to obtain patient data by use of a dictating machine proved successful, and warrants further investigation since the expense involved in hiring and supporting a medical secretary for data gathering is a significant budget item.

Physicians also demonstrated a rather consistent degree of accuracy in predicting their own practice profiles, within five percentage points in each category. The 15 who were asked to make advance predictions mis-estimated from two to six categories by more than five per cent:

1 mis-estimated two categories

2 mis-estimated three categories

5 mis-estimated four categories

2 mis-estimated five categories

5 mis-estimated six categories

In terms of the test composition formula, and consequently the effect on the study, the results would have been:

4 would have had 80 per cent the same test

5 would have had 70 per cent the same test

5 would have had 50 per cent the same test

1 would have had 30 per cent the same test

If, as indicated in the previous discussion, the test questions

and data gathering must be in sub-categories to achieve a greater sensitivity this may increase or decrease the physician's ability to predict his profile. The method shows sufficient promise in accuracy and economy that it should be extensively explored in any future study.

Test Administration

The study demonstrated that physicians can and will be tested on scientific knowledge. However, problems were encountered in the mechanics of test administration.

At times it required 3-5 hours to complete a test designed for administration in two hours, due to technical problems with the time-shared computer. Printing of the text of the question by teletype was slow and the noise of the device proved distracting to some participants. It is felt that the stress factors imposed by the teletype and computer affected test performance in some cases.

The cost of using the computer and telephone communications was high. Cost of administering one test ranged from $50-$60 in computer time alone, and while telephone costs varied depending on geographic location, they were substantial in many cases.

Experimentation was carried out in written testing. During one period of considerable difficulty with the computer testing mechanism, the staff member involved was prepared with a print-out of the test and if the computer malfunctioned, the test was given in written form. This proved to be an acceptable form of testing. It would, however, give the physician an opportunity to procrastinate in completing the test. The computer method required the physician

to allot a specific time period for the test, and it took precedent over the normal interruptions involved in medical practice. A written test might not be given this same priority.

Educational Consultation

There was great variation in the volume and type of activity generated by the consultant-participant relationship. Each educational consultant did visit with the physician-participant to discuss the results of the profiling and testing procedures. A wide variety of educational exercises was prescribed and the most successful, based on comments by the practitioners, were those which were individually designed within a medical center or a teaching hospital to meet specific needs.

In two instances the consultant concluded that the greatest assistance to the practitioner in improving his delivery of medical care did not involve increased scientific knowledge, but rather reorganization of office procedures. A broader application of this unanticipated benefit from the study involved the insight gained by practitioners when they were presented data on the role the telephone was playing in their contact with patients. One practitioner, as noted in Table 5, received an average of 56.2 telephone calls per day during the recording period.

Analysis of the educational consultant's role in the study resulted in the conclusion that the defects were in the procedure. The plan was to establish a one-to-one relationship, with the department playing only a supportive role when requested.

This assumed that the consultant would have a comprehensive knowledge of available resources for continuing medical education. Also, in order that the individuals could develop the desired rapport based on their own personalities and expertise, only general guidelines were given on what this relationship should be. The consultants, for the most part, found themselves in an uncomfortable position due to lack of direction.

This problem was magnified by the fact that most faculty members felt the press of other responsibilities restricted their available time and most participated as consultant to only one participating physician. Therefore, there was little benefit gained from experience. Those who did consult for more than one practitioner found the subsequent assignments easier and more productive.

Experimentation involved one instance where five of the six members on the medical staff of a small community hospital participated in the study. One faculty member served as educational consultant for all five. In this way, the educational program could be devised to meet both the individual and the collective needs of this group of physician participants.

Evaluation

Of the five physicians who were re-tested, two on the basis of re profiles and three on their initial profiles, four showed significant improvement in scoring. One showed a decrease. Documentation of continuing education efforts during the period between tests shows complete correlation; the four who improved did participate and the one who declined carried out no continuing

education as a part of the study.

While this would appear to be strong support for the testing mechanism and educational program, a detailed analysis of the results of the physician who undertook the most extensive educational program contradicts such a conclusion. His improvement in test score could be entirely attributed to receiving some identical questions on both tests and answering them correctly the second time. Other factors which may have been significant were that the computer was functioning well during the re-testing period and the physicians were now familiar with the technical aspects of the testing procedure so there was less distraction.

Considerable weight in evaluation of the study has been placed in the conclusions of a meeting held May 21, 1969 involving the physician-participants, educational consultants and study staff. The major points brought out in the meeting have been presented in the preceding discussion under the appropriate headings.

Two additional points of considerable significance were stressed throughout the meeting:

1. The procedure involved in the study, and particularly the testing experience, proved higuly motivational to the participants. Even those who were most active in updating their medical knowledge found the process forced them to re-evaluate their continuing education programs, resulting in changes in emphasis and discovery of new learning opportunities.

2. The rapport developed between the consultant and

participant, while not successful in terms of the initial study goals, was deemed highly beneficial. The clinician gained a close associate to assist him in using the services and facilities of the medical center for the benefit of his patients and the faculty member gained new insights into clinical medicine which will be valuable in the day-to-day teaching of medical students and house staff.

Conclusions

1. Physicians who are highly motivated in continuing education find the procedure involved in this study promising as a method of identifying their needs and designing appropriate educational programs. While no conclusion can be drawn for less motivated physicians, the greatest value of the process would be its extension to those who are not now updating their medical knowledge through effective continuing education programs.

2. The process cannot be used to make determinations about the competence of a practitioner; it deals with restricted data and measurement which is of use in planning continuing education.

3. Medical practice of physicians do vary significantly, and it is possible to record the necessary data involved in determining individual practice profiles.

4. A broader time base than 3-4 consecutive days should be investigated for gathering the data involved in a practice profile.

5. Alternate, less expensive methods of determining the nature of a physician's practice (e.g., dictation of patient

data by the physician or prediction of the practice profile) show promise as acceptable ways of obtaining the information required for the process.

6. Physicians can and will be tested on scientific knowledge, but the inadequacy of the test bank used in the study rendered the results invalid.

7. Mechanisms are required to insure relevance of questions to clinical practice and a higher correlation between question content and specific patient problems involved in the physician's practice.

8. While a test of 100 items on the major categories of a practice profile appear adequate, more extensive testing would be desirable.

9. Computerized testing from a remote teletype terminal presented problems detrimental to the objectives of the study; consequently it is considered advisable to utilize written testing in continuation of the study.

10. While the educational consulting process did not provide the results expected, it performed a valuable function in developing rapport between the academician and the practicing physician which could have significant long-range benefits.

11. Faculty members serving as consultants can assist the clinician in recognizing educational needs, but cannot be expected to have expertise on available resources and methods for continuing medical education.

12. There is merit in working with groups of physicians in the same clinic or on the same hospital staff to identify common

as well as individual educational needs and designing educational programs to meet both.

13. The evaluation involving re-testing was inconclusive as to whether the process did identify and meet educational needs.

Based on the reactions of all personnel involved in the study and analysis of the procedures and results, it is concluded that the study performed under the contract proved the feasibility of the process, and that it warrants continued investigation with refinement and changes in those portions of the study which did not provide conclusive results.

This continuing study should involve experimentation with mechanisms which would reduce the cost of the process to the point that it could be provided on a nearly self-supporting basis.

Table 1

PHYSICIAN INFORMATION

Physician Code No.	Physician Age	Years In Practice	Type Of Practice	Size Of Community (in thousands)	Number Of Physicians In Community	Medical Education
10016	35	9	G.P.	2	3	Wisconsin 1959
13029	46	18	G.P.	2	3	Wisconsin 1950
15028	39	12	G.P.	36	74	Cincinnati 1951
16049	40	10	G.P.	5	3	Nebraska 1956
20021	39	9	G.P.	8	12	Wisconsin 1959
20025	34	3	I.M.	53	120	Loyola 1960
21069	52	19	G.P.	2	3	Wisconsin 1949
23083	36	10	I.M.	53	120	Wisconsin 1958
23668	30	1	G.P.	15	12	Michigan 1965
24093	52	22	G.P.	4	6	Wisconsin 1946
25016	34	2	I.M.	53	120	St. Louis 1959
30077	33	3	G.S.	15	12	Columbia 1961
31310	46	14	Ped.	63	67	Kansas 1955

35006	38	7	G.P.	163	482	Marquette 1961
36247	36	6	G.P.	34	58	Georgetown 1959
36375	39	8	G.P.	5	11	Wisconsin 1960
42083	64	31	G.P.	2	3	Wisconsin 1937
42553	59	17	G.P.	2	3	Wisconsin 1951
46078	48	21	G.P.	8	16	Chicago 1945
46540	43	13	G.P.	1	1	Manitoba 1955
50050	44	12	Ped.	35	60	Hahnemann 1954
51328	39	7	G.P.	1	1	Maryland 1961
52030	40	12	G.P.	1	2	Illinois 1954
55074	40	7	G.P.	13	27	Iowa 1957
55352	38	6	G.P.	36	74	Wisconsin 1962
56343	35	5	G.P.	1	4	Indiana 1960
60045	43	17	G.P.	163	482	Cincinnati 1951
61275	41	16	G.P.	8	12	Iowa 1953
62029	43	16	G.P.	8	12	Wisconsin 1952
62048	45	13	I.M.	53	120	Northwestern 1958
62075	43	12	Ped.	53	120	St. Louis 1951
62079	51	22	Ped.	53	120	Buffalo(SUNY) 1945
63053	63	34	G.P.	5	7	Rochester 1932
64233	29	2	G.P.	2	3	Wisconsin 1964
65010	49	22	G.P.	15	12	Marquette 1947
65233	31	1	G.P.	163	482	Wisconsin 1966
66331	41	11	G.P.	8	12	Illinois 1954
High	64	29	--	163	482	---
Low	29	1	--	1	1	---
Average N=37	42.1	12.1	--	30.9	72.4	---

Table 2

Classification of Diagnoses & Test Items

Category Number	Explanation
1	Infective and parasitic diseases
2	Neoplasms
3	Allergic, endocrine system, metabolic, and nutritional diseases
4	Mental, psychoneurotic, and personality disorders
5	Diseases of the nervous system and sense organs
6	Diseases of the circulatory system
7	Diseases of the respiratory system
8	Diseases of the digestive system
9	Diseases of the genito-urinary system
10	Deliveries and complications of pregnancy, childbirth, and the puerperium
11	Diseases of the skin and cellular tissue, bones and organs of movement
12	Congenital malformations and certain diseases of early infancy
13	Senility, senility, and ill-defined conditions
14	Accidents, poisonings, and violence
15	Special conditions and examinations without sickness
16	Undiagnosed
17	Blood and blood-forming organs
18	Hypertension

E 3

Individual Physician Profile
DATA RECORDING FORM

Physician Number_____
Date _____
Page Number _____

esenting Symptoms	Positive Physical Findings	Diagnosis or Probable Diagnosis	Diagnostic Tests Ordered	Treatment Ordered	Code

TABLE 3

Individual Physician Profile
DATA RECORDING FORM

Patient			Where				Time With Patient	Presenting Symptoms	Positive Physical Findings	Diagnosis or Probable Diagnosis	Diagnostic Tests Ordered
No.	Age	Sex	Off.	Hos.	Ph.	Home					

Table 4 -- Daily Practice Patterns

Physician Code No.	Average No. of Daily Patient Contacts	Type of Patient Contact: Average Hospital	Average Office	Average House	Average Telephone	Sex of Patient: % Male	% Female	% Unknown
10016	41.2	9.5	17.5	0.6	14.0	41.7	57.6	-
13029	61.9	9.5	37.0	-	16.4	43.8	55.1	-
15028	65.6	9.2	26.[illegible]	-	30.0	33.0	64.0	3.0
16049	70.5	7.7	59.2	-	3.5	39.3	58.5	-
20031	47.0	5.5	31.0	-	10.5	38.3	61.6	-
20025	51.0	19.0	18.3	0.3	13.3	43.3	56.7	-
21042	49.3	4.[illegible]	31.3	1.1	13.1	39.0	59.5	-
23083	44.0	12.[illegible]	17.3	-	14.7	45.7	45.5	7.8
23663	38.6	11.[illegible]	19.1	-	7.7	49.2	50.8	-
24093	57.3	7.[illegible]	35.7	2.0	12.0	37.8	62.2	-
25016	28.5	6.5	15.3	-	6.7	40.5	59.5	-
30077	30.0	10.3	10.0	0.4	9.3	39.1	55.7	5.2
31310	63.7	14.5	26.2	-	23.0	53.8	45.8	-
35006	71.7	10.7	32.7	1.3	28.0	32.5	67.5	-
36247	97.1	13.7	41.1	-	37.3	30.8	66.2	2.9
36375	47.3	2.5	34.0	-	10.8	32.3	66.1	1.6
42083	59.5	4.0	50.8	0.7	4.0	39.0	58.3	-
42553	51.2	21.0	15.0	0.3	15.0	46.3	53.8	-
46078	24.0	4.8	17.3	1.0	1.0	38.0	62.0	-
46540	64.5	8.7	33.0	2.3	17.0	36.0	64.0	-
50050	35.8	5.2	33.3	-	36.2	53.1	47.2	-
51528	55.5	3.8	29.0	1.0	21.7	36.3	63.7	-
52030	44.8	3.0	33.3	0.4	7.7	35.7	61.7	2.6
55074	38.0	7.5	18.7	-	11.7	34.5	65.5	-
[illegible]	70.0	21.0	25.6	0.6	22.0	34.0	66.0	-
[illegible]	23.[illegible]	[illegible].1	14.3	-	4.3	48.0	52.0	-

Physician Code No.	Average No. of Daily Patient Contacts	Type of Patient Contact: Average Hospital	Average Office	Average House	Average Telephone	Sex of Patient: % Male	% Female	% Unknown
60045	51.7	1.2	34.3	-	16.1	31.2	68.[illegible]	0.2
61275	67.0	9.5	32.5	-	15.0	38.0	68.2	-
62029	70.0	6.8	37.0	0.5	25.7			
62048	51.3	18.6	15.6	0.3	16.6	39.6	60.4	-
62075	50.0	9.3	25.3	-	15.3	36.5	47.4	16.1
62079	54.6	8.5	28.3	-	18.0	26.5	42.5	31.0
63053	38.1	9.[illegible]	26.0	0.5	2.5	42.5	57.7	-
64233	46.7	8.0	30.0	-	8.2	47.3	51.5	-
65010	70.9	22.8	27.7	0.7	19.7	35.3	64.7	-
65233	21.3	1.7	14.3	-	5.3	73.3	26.2	-
66331	79.0	6.3	43.3	1.3	28.0	40.0	60.0	-
High	79.0	22.8	59.2	2.3	56.2			
Low	21.3	1.2	10.0	0.3	1.0			
Average	53.9	9.3	28.0	0.4	15.7			
U.C.H.C.	24.6	12.9	31.4	-	30.3	45.0	44.0	11.0

Table 5
Percent of Patient Contacts in Each Category

Category	Individual Physician Code Numbers										
	10016	13027	15028	16049	20021	20023	21069	23083	23668	24093	25016
1. Infective - parasitic	15.7	16.7	13.4	5.6	4.1	7.1	13.6	5.0	11.2	4.6	10.6
2. Neoplasms	4.0	1.9	-	1.2	0.5	6.1	2.0	0.8	1.3	-	3.8
3. Allergic, endocrine system, metabolic, and nutritional	6.2	3.1	5.3	5.2	3.2	8.7	4.5	16.1	4.2	8.0	11.6
4. Mental, psychoneurotic, and personality disorders	5.9	1.9	6.0	7.1	1.5	5.1	6.3	2.3	3.7	3.4	6.3
5. Nervous system & sense organs	0.7	1.2	1.9	1.4	8.1	9.7	2.0	14.6	0.7	4.3	1.8
6. Circulatory system	12.0	9.9	6.3	5.6	4.7	20.1	7.3	27.1	24.7	1.7	23.4
7. Respiratory system	1.1	10.4	9.9	21.0	30.6	5.6	13.6	8.6	12.1	9.0	7.0
8. Digestive system	7.7	11.8	8.1	3.3	2.7	7.8	14.9	7.8	2.6	6.4	8.0
9. Genito-urinary system	3.8	5.1	3.9	6.1	6.1	4.2	3.6	1.4	7.2	9.0	6.6
10. Deliveries-complications of pregnancy, childbirth, and the puerperium	4.5	7.6	13.1	11.6	7.7	-	5.2	-	3.0	18.0	-
11. Skin & cellular tissue, bones and organs of movement	9.6	3.7	4.5	6.8	5.7	12.0	3.7	5.4	3.6	4.9	10.3
12. Congenital malformations & certain dis. of early infancy	0.3	3.7	3.7	2.0	5.1	-	2.1	-	4.3	6.7	-
13. Symptoms, senility, and ill-defined conditions	-	-	-	-	-	-	-	-	-	-	-
14. Accidents, poisonings, and violence - trauma	13.5	11.3	11.9	10.1	11.1	2.3	8.3	3.0	10.4	7.8	5.3
15. Special conditions & examinations without sickness	4.2	2.3	7.6	2.4	2.8	7.0	-	6.1	7.0	-	5.9
16. Undiagnosed	4.2	1.3	3.7	1.8	4.8	3.3	11.2	2.3	4.4	-	3.0
17. Blood & blood-forming organs	1.2	-	0.8	0.3	-	0.3	-	-	0.2	-	-
18. Hypertension	3.2	-	2.0	1.5	-	5.7	-	10.0	3.2	-	9.4

0077	31310	35006	36247	36375	42083	42553	46078	46540	50050	51328	52030	55074	55352	56343
6.5	5.9	6.4	3.7	3.6	17.4	10.6	7.0	8.[illegible]	11.0	13.4	6.3	5.6	10.7	9.4
7.2	-	-	1.3	3.4	1.1	1.7	3.1	2.3	-	1.4	1.2	3.3	0.7	1.2
6.8	4.3	7.2	4.4	4.8	8.1	5.3	4.0	7.3	2.4	6.8	7.9	7.9	9.4	7.4
0.8	0.6	5.0	3.7	2.1	0.7	6.6	0.3	6.3	0.3	7.7	4.6	4.6	0.4	5.5
1.1	2.5	4.6	1.1	2.9	1.2	2.9	6.0	0.7	1.7	6.5	8.0	3.6	4.2	1.4
15.3	1.2	2.2	3.8	10.3	3.2	18.0	13.2	3.2	-	9.3	6.6	2.2	4.5	5.0
5.4	55.2	14.5	7.6	10.1	16.9	6.9	3.7	3.3	46.9	14.6	8.5	13.3	9.4	4.4
23.8	5.3	3.3	[illegible]	2.3	5.7	11.3	7.6	21.5	2.3	2.5	7.0	5.9	14.3	3.0
11.3	0.9	4.6	4.3	11.1	15.5	4.1	2.5	5.6	0.6	5.3	6.5	5.3	6.6	4.9
-	-	10.1	21.3	11.3	4.1	9.3	13.9	2.2	-	3.2	6.8	13.1	10.9	3.4
6.7	1.3	3.8	5.4	3.5	3.4	[illegible]	10.5	0.4	3.8	11.4	9.3	[illegible]	4.2	5.[illegible]
-	10.5	8.0	11.3	4.2	3.7	1.5	5.7	-	8.4	2.9	2.6	2.6	5.1	3.3
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.4	4.9	10.6	7.3	13.3	4.5	13.7	16.0	11.7	3.5	10.0	13.7	10.0	7.6	22.3
-	0.3	0.4	2.0	4.1	2.4	1.1	5.6	1.2	6.9	2.3	3.7	3.4	2.3	4.3
2.3	4.5	15.0	3.7	0.1	0.4	1.5	1.0	3.8	10.0	1.8	2.3	2.4	0.5	1.7
0.3	1.6	-	1.7	0.3	1.3	0.6	1.0	0.4	1.3	-	-	1.3	0.5	-
-	-	-	1.3	-	3.2	1.3	4.9	1.6	-	3.9	3.0	0.7	3.0	2.2

60235	61275	62029	62048	62075	62079	63053	64233	65010	65233	66331	High	Low	Average	JCHS
[illegible]	5.4	6.2	4.2	17.4	16.8	1.2	15.1	10.0	17.0	4.1	18.2	1.2	9.6	18.7
[illegible]	0.5	0.2	3.9	0.7	4.3	4.6	0.7	0.4	1.6	1.2	7.7	-	2.4	-
9.3	6.1	4.9	8.4	7.0	7.8	6.8	2.2	10.0	3.5	7.0	16.1	1.1	6.6	1.1
-	5.9	7.6	7.7	-	0.7	2.8	1.8	6.2	0.8	3.2	9.4	-	3.9	0.3
1.4	9.8	2.1	11.6	2.1	6.3	1.6	1.4	2.7	2.3	6.6	14.6	0.7	3.9	3.8
4.4	6.1	9.0	15.5	-	2.6	9.0	9.1	8.3	4.8	5.2	27.1	-	8.8	-
13.7	13.3	12.7	4.4	16.5	12.7	10.8	19.0	13.2	12.3	25.5	55.2	4.4	14.2	11.2
1.3	4.2	6.4	12.7	4.7	8.8	15.6	8.2	6.1	5.4	3.7	28.4	1.3	7.3	9.4
4.2	9.2	7.0*	4.3	0.9	1.7	9.5	2.8	7.4	6.9	4.5	15.5	0.6	5.6	4.0
7.5	5.5	6.1	-	-	-	4.9	7.5	15.9	10.8	6.7	21.3	-	6.7	1.2
5.5	6.5	9.6	12.3	5.1	6.6	4.7	3.9	8.1	7/7	6.2	12.3	1.3	6.6	3.1
0.5	1.1	4.0	-	21.0	18.7	2.0	7.5	4.0	5.4	6.5	21.0	-	4.6	30.5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.0	10.0	8.2	7.1	6.2	4.5	13.1	10.0	5.6	7.7	10.4	27.3	1.5	9.3	1.5
7.6	3.4	7.9	6.0	7.2	5.6	9.5	2.8	1.7	10.8	3.6	10.8	-	4.4	7.4
6.6	3.1	6.8	1.9	8.2	3.0	3.3	2.1	-	3.1	3.9	15.0	-	3.9	8.0
0.3	0.8	1.4	-	1.0	0.6	0.3	-	0.6	-	0.5	3.0	-	0.6	-
-	0.4	1.7	3.8	-	-	-	-	1.1	0.5	-	10.0	-	1.8	-

Table 6
ESTIMATED VS. ACTUAL PROFILES OF PRACTICE*
Individual Physician Code Numbers

	10016#			13029			20025			21069			23083			23668		
Cate.	(Est.)1	(Act.)2	(Dif.)3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
1	16.0	15.7	0.3	28.0	16.7	11.3	10.0	7.1	2.9	20.0	13.6	6.4	12.0	5.0	7.0	12.0	11.2	0.8
2	3.0	4.9	1.9	2.0	1.9	0.1	1.0	6.1	5.1	5.0	3.0	2.0	1.0	0.8	0.2	2.0	1.3	0.7
3	2.0	6.2	4.2	2.0	3.1	1.1	2.0	8.7	6.7	5.0	4.5	0.5	15.0	16.1	1.1	5.0	4.2	0.8
4	15.0	5.9	9.1	4.0	1.9	2.1	3.0	5.1	2.1	3.0	6.3	3.3	5.0	2.3	2.7	9.0	3.7	5.3
5	2.0	0.7	1.3	1.0	1.2	0.2	20.0	9.7	10.3	-	2.0	2.0	5.0	14.0	9.0	3.0	0.7	2.3
6	8.0	12.0	4.0	3.0	9.9	6.9	10-20	20.1	0.1	5.0	7.3	2.3	20.0	27.1	7.1	18.0	24.7	6.7
7	10.0	6.1	3.9	25.0	18.4	6.6	10-20	5.6	4.4	20.0	13.6	6.4	12.0	8.6	3.4	11.0	12.0	1.0
8	6.0	7.8	1.8	7.0	11.8	5.8	2-20	7.6	-	-	14.9	14.9	16.0	7.8	8.2	5.0	2.6	2.4
9	5.0	3.8	2.2	2.0	5.1	3.1	2.0	4.2	2.2	-	3.6	3.6	5.0	1.4	3.6	4.0	7.2	3.2
10	8.0	4.5	3.5	5.0	7.6	2.6	-	-	-	20.0	5.2	14.8	-	-	-	4.0	3.0	1.0
11	4.0	9.6	5.6	5.0	3.7	2.7	30.0	12.0	18.0	-	3.7	3.7	2.0	5.4	3.4	3.0	5.6	2.6
12	8.0	0.3	7.7	5.0	3.7	2.7	-	-	-	20.0	2.1	17.9	-	-	-	5.0	4.3	0.7
13																		
14	2.0	13.5	11.5	1.0	11.3	10.3	1.0	2.3	1.3	-	8.3	8.3	-	3.0	3.0	7.0	10.4	3.4
15	4.0	4.2	0.2	1.0	2.3	1.3	10.0	7.0	3.0	-	-	-	2.0	6.1	4.1	8.0	7.0	1.0
16	4.0	4.2	0.2	1.0	1.4	0.4	1.0	3.3	2.3	-	11.2	11.2	1.0	2.3	1.3	-	4.4	4.4
17	2.0	1.2	0.8	1.0	-	1.0	1.0	0.3	0.7	-	-	-	4.0	-	4.0	1.0	0.2	0.8
18	5.0	3.2	1.8	5.0	-	5.0	7.0	5.2	2.7	2.0	-	2.0	15.0	10.0	5.0	3.0	3.2	0.2

*LEGEND: Column 1 = Estimated Profile
Column 2 = Actual Profile
Column 3 = Difference Between Estimated and Actual Profile

= Physician Code Number

25016			42093			42552			46079			51328			60045			62048		
1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
5.0	10.6	5.6	20.0	17.4	2.6	25.0	10.6	14.1	11.0	7.0	3.0	2.0	13.4	11.4	11.0	18.2	17.2	10.0	4.2	5.8
-	3.8	3.8	>1.0	1.1	-	2.0	1.7	0.3	1.0	3.1	2.1	1.0	1.4	0.4	1.0	2.6	1.6	2.0	3.9	1.9
4.0	11.6	7.6	5.0	8.1	3.1	4.0	5.3	1.3	>4.0	4.0	-	4.0	6.8	2.8	5.0	9.3	4.3	5.0	8.4	3.4
15.0	6.3	8.7	3.0	0.7	2.3	20.0	6.6	13.4	7.0	0.3	6.7	12.0	7.7	4.3	5.0	-	5.0	15.0	7.7	7.3
2.0	1.8	0.2	2.0	1.2	0.8	2.0	2.9	0.9	>4.0	6.0	2.0	1.0	6.5	5.5	2.0	1.4	0.6	2.0	11.6	9.6
25.0	23.4	1.6	5.0	8.2	3.2	15.0	18.0	3.0	>4.0	13.3	9.3	3.0	9.3	6.3	4.0	4.4	0.4	17.0	15.5	2.5
5.0	7.0	2.0	20.0	16.9	3.1	-	6.9	6.9	11.0	3.7	7.3	30.0	14.6	15.4	13.0	18.7	5.7	5.0	4.4	0.6
7.0	8.0	1.0	5.0	3.7	1.7	6.0	11.3	5.3	4.0	7.0	3.0	10.0	25.0	15.0	3.0	1.3	1.7	3.0	12.7	4.7
3.0	6.6	3.6	30.0	15.5	14.5	2.0	4.1	2.1	4.0	2.5	1.5	2.0	5.3	3.3	3.0	4.2	1.2	3.0	4.3	1.[illegible]
-	-	-	21.0	4.1	16.9	5.0	9.3	4.3	15.0	12.8	2.2	4.0	3.2	0.8	7.0	7.5	0.5	-	-	-
5.0	10.3	5.3	>1.0	8.4	7.4	6.0	4.9	1.1	7.0	10.5	3.5	3.0	11.4	8.4	4.0	5.5	1.5	10.0	12.3	2.3
-	-	-	3.0	3.7	0.7	5.0	1.5	3.5	7.0	5.7	1.3	2.0	2.9	0.9	15.0	0.5	14.5	0.5	-	0.5
3.0	5.3	2.3	1.0	4.5	3.5	3.0	13.7	10.7	11.0	16.0	5.0	10.0	10.0	-	6.0	11.0	5.0	4.0	7.1	3.1
10.0	5.9	4.1	1.0	2.6	1.6	2.0	1.1	0.9	4.0	6.0	2.6	2.0	2.3	0.3	15.0	7.6	7.4	5.0	6.0	1.0
3.0	-	3.0	-	0.4	0.4	2.0	1.5	0.5	>4.0	1.0	3.0	2.0	1.8	0.2	4.0	6.6	2.6	1.5	1.9	0.4
3.0	3.0	-	-	1.3	1.3	1.0	0.6	0.4	1.0	1.0	-	2.0	-	2.0	3.0	0.3	2.7	2.0	-	2.0
10.0	9.4	0.6	2.0	3.0	1.0	-	1.3	1.3	7.0	4.9	2.1	5.0	2.0	3.0	3.0	-	3.0	10.0	3.8	6.2

64233			65233			UCHS (A)			UCHS (H)		
1	2	3	1	2	3	1	2	3	1	2	3
1.0	15.1	14.1	20.0	17.0	3.0	25.0	18.7	6.3	15.0	18.7	3.7
-	0.7	0.7	0-2	1.6	-	-	-	-	-	-	-
1.0	2.2	0.2	0-2	3.5	1.5	2.0	1.1	0.9	5.0	1.1	3.9
3.0	1.8	2.1	2-5	0.9	1.7	2.0	0.3	1.7	2.0	0.3	1.7
-	1.4	1.4	0-2	2.3	0.3	-	3.8	3.8	4.0	3.8	1.8
3.0	9.1	6.1	2-5	4.8	-	-	-	-	4.0	-	4.0
70.0	19.0	51.0	20.0	12.3	7.7	10.0	11.2	1.2	12.0	11.2	0.8
2.0	8.2	6.2	2-5	5.4	2.9	5.0	8.4	3.4	3.0	8.4	5.4
1.0	2.8	1.8	2-5	6.9	1.9	2.0	-	2.0	1.0	-	1.0
5.0	7.5	2.5	5.0	10.8	5.8	1.0	-	1.0	-	-	-
1.0	8.9	7.9	5.0	7.7	2.7	2.0	-	2.0	3.0	-	3.0
5.0	7.5	2.5	5.0	5.4	0.4	30.0	30.5	0.5	30.0	30.5	0.5
3.0	10.0	7.0	10.0	7.7	2.3	2.0	1.5	0.5	3.0	1.5	1.5
2.0	2.8	0.8	5.0	10.8	5.8	15.0	7.4	7.6	20.0	7.4	12.6
-	2.1	2.1	-	3.1	3.1	2.0	8.0	6.0	-	8.0	8.0
-	-	-	0-2	-	2.0	-	-	-	2.0	-	2.0
1.0	-	1.0	2-5	0.5	1.5	-	-	-	4.0	-	4.0

Table 7

Practice Profile

Category	Percent	Category	Percent
1.	5.4	10.	5.5
2.	.5	11.	6.5
3.	6.1	12.	1.1
4.	5.9	13.	—
5.	9.8	14.	10.0
6.	6.1	15.	3.4
7.	17.3	16.	8.1
8.	4.2	17.	.8
9.	9.2	18.	.4

Test Composition

Category	Percent	Blocks		Selected	Standard	Total
7	17.3	3	x 5 =	15	6	21
14	10.0	2	x 5 =	10	6	16
5	9.8	2	x 5 =	10	6	16
9	9.2	2	x 5 =	10	6	16
11	6.5	1	x 5 =	5	6	11
3	6.1	1	x 5 =	5	6	11
Totals				55	36	91

(Add or subtract categories to bring total as near 100 as possible):

6	6.1	1	5	6	11
				Total	102
Totals					