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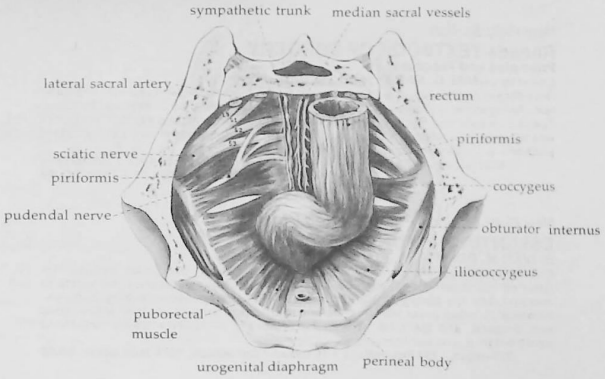
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Results of the NIRMP for 1977

John S. Graettinger, M.D.

Abstract—The results of the National Intern and Resident Matching Program for the past four years show a steadily increasing number of positions offered and filled in the primary care specialties. The number and percentage of unmatched U.S. students decreased. The number of foreign medical graduates matched remained constant. Marked differences in the numbers of positions offered and filled were found among the various regions of the country.

The numbers of positions offered and filled by graduating students from U.S. medical schools (USS) and by others in the National Intern and Resident Matching Program (NIRMP) for the years 1974, 1975, and 1976 were presented in a recent report (1). The results showed a decreasing ratio of numbers of positions offered to the increasing numbers of USS and also that the preference of the majority of USS who participated in the matching program was for primary care residencies. Since 20 percent of USS did not obtain positions in the first year of graduate medical education through the match in 1976, a study was made of the types and location of residencies obtained by them outside the NIRMP. The percentage distribution of essentially all USS among the various types of specialty programs was not significantly different from that found among all students who matched. What follows is a description of the results of the NIRMP in 1977. These data, when compared with those of the past three years, make evident the trends in the relationships among the numbers and kinds of positions available and the preferences of USS for them.

Dr. Graettinger is executive vice president, National Intern and Resident Matching Program; dean of faculty affairs, Rush University; director of graduate medical education at Rush-Presbyterian-St. Luke's Medical Center; and professor of medicine at Rush Medical College, Chicago.

Results

Participation and success rates in the NIRMP for the first year of graduate medical education (GME-1) for all applicants in 1977 are shown in Table 1. The numbers of USS and North American graduates (NAG)* who applied to, participated in, and successfully matched in the NIRMP in 1977 were greater than the corresponding numbers in 1976 (1). Ninety-two percent of 279 "fifth pathway" students successfully matched. The percentages of unmatched USS and NAG were lower than they were in 1976. The number of applications from and active participants who were non-U.S.-nationals and graduates of non-U.S. medi-

* NAG include graduating students from U.S. osteopathic schools; Canadian medical schools; physician candidates, that is, U.S. graduates who did not enter GME directly from medical school; and "fifth pathway" students, who are U.S. nationals who have completed course requirements for a medical degree abroad followed by a year of clinical training in a U.S. hospital under medical school sponsorship.

TABLE 1

Participation in the National Intern and Resident Matching Program in 1977

Category	USS*		NAG*		FMG*		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Applicants	13,385	100	799	100	4,814	100	18,998	100
Withdrawals	1,487	11	254	32	1,403	29	3,144	17
Active Participants	11,898	89	545	68	3,411	71	15,833	83
Matched	11,172	94	458	84	1,130	33	12,760	80
Unmatched	726	6	87	16	2,281	67	3,094	20
Total	11,898	100	545	100	3,411	100	15,833	100

* USS = graduating students from U.S. medical schools; NAG = North American graduates (see first footnote in text); and FMG = Non-U.S.-national graduates of foreign medical schools.

cal schools (FMG) decreased by over 1,000. Essentially the same number of FMG matched as in the past three years; therefore, the percentage of FMG who successfully matched increased. The number of USS who withdrew after initial enrollment was the same as it was in 1976. The number of individuals who were eligible but who did not enroll has not yet been determined.

The numbers and distributions of USS, NAG, and FMG who matched into the various types of programs are shown in Table 2. Sixty-six percent of USS chose the generalist specialties.† The percentages of all applicants and of USS who matched in the generalist and primary care specialties† were greater than the percentages that the numbers of positions offered in these specialties represented of total positions offered. The percentages of all applicants and of USS who matched in the support specialties† and flexible residencies, however, were less than the percentages of positions offered in them. The distribution of the NAG among types of programs was similar to that of USS, but the distribution of FMG differed strikingly. FMG continued to be concentrated in pediatrics, general surgery, pathology, and flexible residencies and to be less represented in the other generalist and surgical specialties than USS or NAG.

The numbers of positions offered and filled by all applicants in each type of specialty from 1974 through 1977 are shown in Table 3. The abolition of the free-standing rotating internship in 1975 and its replacement by flexible residencies resulted in a drop in numbers of positions offered from 1974 to 1975 despite increases in the generalist specialties, in psychiatry, and in the support specialties. Despite a decrease of 829 in total positions offered since 1974, there has been an increase of 2,392 positions offered in the generalist specialties. Since 1974 the number of USS matched increased by 1,948; the number who matched into the generalist specialties increased by 2,274, and 326 fewer matched into all other types of programs. The percentage filling of all programs increased from 61 to 77 percent; and, with the exception of general practice, all types of programs in the generalist specialties were over 80 percent filled in 1977.

Eighty-nine percent of USS who participated in NIRMP (95 percent of those who successfully matched) obtained a residency in the type of specialty which they had listed as their first choice. An-

† "Generalist" specialties are defined as family practice, general practice, internal medicine, obstetrics, and pediatrics. "Primary care" specialties include all of the generalist specialties except obstetrics and general practice. "Support" specialties include anesthesiology, pathology, physical medicine, and diagnostic and therapeutic radiology.

TABLE 2

Distribution of Positions Offered and Filled, by Specialty and Kinds of Applicants in the NIRMP in 1977

Specialties	Positions Offered		Positions Filled									
			USS*		NAG*		FMG*		Total			
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent		
Family practice	1,874	11	1,409	13	57	12	42	4	1,508	12		
General practice	55	†	0	†	1	†	12	1	13	†		
Internal medicine	5,351	32	4,199	38	169	37	302	27	4,670	37		
Pediatrics	1,652	10	1,165	10	32	7	202	18	1,399	11		
Obstetrics	865	5	625	6	35	8	50	4	710	6		
Dermatology	9	†	7	†	0	†	0	†	7	†		
Neurology	77	†	54	†	1	†	2	†	57	†		
Psychiatry	870	5	437	4	12	3	32	3	481	†		
Surgery	2,349	14	1,460	13	74	16	219	19	1,753	14		
Surgical specialties	329	2	249	2	9	2	4	†	262	2		
Neurosurgery	(27)		(16)		(1)		(1)		(18)			
Ophthalmology	(41)		(29)		(1)		(0)		(30)			
Orthopedics	(198)		(149)		(4)		(2)		(155)			
Otolaryngology	(51)		(23)		(1)		(1)		(25)			
Urology	(62)		(32)		(2)		(0)		(34)			
Anesthesiology	392	2	160	1	7	2	25	2	192	1		
Pathology	585	4	253	2	3	1	45	4	301	2		
Physical medicine	66	†	21	†	0	†	3	†	24	†		
Diagnostic radiology	412	3	224	2	4	1	10	1	238	2		
Therapeutic radiology	66	†	9	†	0	†	5	†	14	†		
Rotating/flexible	1,572	10	900	8	54	12	177	16	1,131	9		
Total	16,574	99	11,172	99	458	99	1,130	99	12,760	100		

* USS = graduating students from U.S. medical schools; NAG = North American graduates (see first footnote in text); and FMG = non-U.S.-national graduates of foreign medical schools.

† Less than 1 percent.

TABLE 3
Positions Offered and Filled by all Applicants in the NIRMP in 1974–77, by Specialty

Specialty	1974			1975			1976			1977		
	No. of Positions Offered	Openings Filled		No. of Positions Offered	Openings Filled		No. of Positions Offered	Openings Filled		No. of Positions Offered	Openings Filled	
		No.	Percent		No.	Percent		No.	Percent		No.	Percent
Family practice	1,016	821	81	1,362	1,163	85	1,637	1,396	85	1,874	1,508	81
General practice	67	0	†	58	5	9	68	9	13	55	13	24
Internal medicine	4,347	3,462	80	4,845	4,260	88	4,971	4,513	91	5,351	4,670	87
Pediatrics	1,380	1,044	76	1,450	1,189	82	1,576	1,323	84	1,652	1,399	85
Obstetrics	595	307	52	804	571	71	808	640	79	865	710	82
Dermatology	21	0	†	16	9	56	12	7	58	9	7	78
Neurology	38	2	5	61	23	38	82	44	54	77	57	74
Psychiatry	489	248	51	744	336	45	897	420	47	870	481	55
Surgery	2,452	1,563	64	2,497	1,802	72	2,417	1,787	74	2,349	1,753	75
Surgical specialties	202	45	22	328	178	54	355	180	51	379	262	69
Neurosurgery	(8)	(3)	(38)	(17)	(10)	(59)	(21)	(14)	(67)	(27)	(18)	(67)
Ophthalmology	(48)	(9)	(19)	(63)	(35)	(56)	(56)	(31)	(55)	(41)	(30)	(73)
Orthopedics	(75)	(23)	(31)	(139)	(95)	(68)	(180)	(116)	(64)	(198)	(155)	(78)
Otolaryngology	(24)	(2)	(8)	(58)	(18)	(31)	(50)	(24)	(48)	(51)	(25)	(49)
Urology	(47)	(8)	(17)	(51)	(20)	(39)	(48)	(25)	(52)	(62)	(34)	(55)
Anesthesiology	170	34	20	393	149	3	397	159	40	392	192	49
Pathology	635	206	32	641	233	36	601	274	46	585	301	52
Physical medicine	37	5	14	48	19	40	51	15	29	66	24	21
Diagnostic radiology	278	58	21	360	113	31	424	203	48	412	238	58
Therapeutic radiology	11	1	9	45	11	24	59	14	24	66	14	21
Rotating/flexible	5,665	2,826	50	2,039	1,219	60	1,757	1,201	68	1,572	1,131	72
Total	17,403	10,622	61	15,891	11,280	64	16,112	12,215	76	16,574	12,760	77

† Less than 1 percent.

other 6 percent of participating USS were unmatched; 583 (81 percent) of the unmatched students had listed a program in a generalist specialty as their first choice. Of the 5 percent of USS who matched into a type of program other than that of their first choice, nearly half were placed in a flexible residency; and they represented almost a third of USS in flexible programs.

Although the supply of positions offered in the generalist specialties has been increasing concurrently with the demand of USS for positions in these specialties, striking regional differences were found. In order to compare various regions of the country, ratios of graduates matched,‡ positions offered, and positions filled in the generalist specialties per 100,000 population were calculated (Figure 1) for each of the 10 regions defined by the U.S. Department of Health, Education, and Welfare: New England—Maine, Vermont, Massachusetts, Connecticut, Rhode Island, and New Hampshire; New York-Jersey—New York, New Jersey, and Puerto Rico; Mideast Coast—Pennsylvania, Delaware, District of Columbia, Maryland, Virginia, and West Virginia; Southeast—Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Midwest—Illinois, Indiana, Ohio, Minnesota, Michigan, and Wisconsin; Midsouth Central—Arkansas, New Mexico, Oklahoma, Texas, and Louisiana; Plains—Iowa, Kansas, Missouri, and Nebraska; Mountain—Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; Southwest—Arizona, California, Hawaii, and Nevada; Northwest—Alaska, Idaho, Oregon, and Washington.

The total number of graduates matched into all types of programs averaged 5.2 per 100,000 but ranged from 7.3 in the Mideast Coast and Plains regions to below 4.1 in the Southeast, Mountain, Southwest, and Northwest. The percentage of these graduates who entered the generalist specialties ranged from 73 percent in the New England and New York-Jersey regions to below 60 percent in the Southeast and Plains; the numbers of these graduates who entered the generalist specialties from the schools of each region ranged from 5.1 per 100,000 population in the Mideast Coast to 2.0 in the Northwest.

The number of positions offered in the generalist specialties within each region also varied markedly from 6.6 in the New York-Jersey region to 2.2 in the Northwest. The ratio of the positions offered in each region to the numbers of graduates from its schools was 1.3:1 nationally, below 1:1 in the Plains, only 1.1:1 in the Mideast Coast, but 1.4:1 in the New York-Jersey, Southeast, Midwest, and Southwest regions. If the number of positions in programs that did not attract a single U.S. graduate (non-USG programs [2]) are subtracted from the total offered in the generalist specialties in each region, the ratio of positions in programs regarded as acceptable by USS was 1.2:1 nationally but below 1:1 in the Mideast Coast and Plains and only 1.1:1 in New York-Jersey.

The number of graduates from the schools of all regions who matched into the positions offered in each region ranged from 5.1 in the New England region to 2.2 in the Northwest. These USS filled 76 percent of the positions nationally, from 99 percent of the positions in the Northwest to 62 percent in the New York-Jersey region. Nationally,

‡ The positions obtained by the additional 2,000 graduates (1/100,000) who were unmatched or who withdrew are not yet tabulated; a study of the 1976 graduates who obtained positions outside of the match showed that they were evenly distributed among the regions.

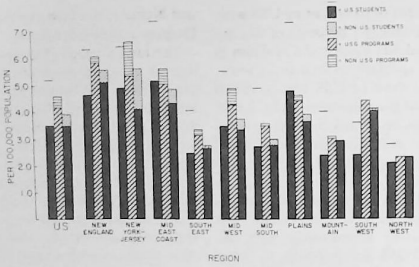


FIGURE 1

The generalist specialties in the matching program in 1977. The left columns represent the numbers of graduates from the medical schools in each region—expressed as ratios per 100,000 population—who matched into the generalist specialties nationally; the lines above the column represent the total number of graduates matched. The middle columns represent the number of positions offered in the generalist specialties for each region and also show the number of positions in programs which attracted one or more U.S. graduates. The right columns represent the number of U.S. students from all regions and of non-U.S. students who entered the GME-1 positions offered in each region.

86 percent of USG programs were filled by USS; only in New York-Jersey and the Midwest was the filling of positions below 80 percent.

In addition to the filling of positions in the generalist specialties by USS, 902 (57 percent) of the NAG and FMG who matched entered these programs; the great majority were in the New England, New York-Jersey, Mideast Coast and Midwest regions. Over half of them entered USG programs. The filling of USG programs by all applicants nationally was 89 percent; in the Southeast, Midwest, Midsouth, and Plains the filling of positions was below 90 percent.

Discussion

These NIRMP results for 1977, when compared with preceding years, document the choice of the increasing numbers of USS for positions in the primary-care-generalist specialties and the excellent response of the hospitals that offer programs in graduate medical education in providing increasing numbers of positions in generalist programs. However, several problems can readily be identified. Programs in the generalist specialties that do not attract a single U.S. medical school graduate—while other programs which do match U.S. graduates are well filled—would seem to be of less than adequate quality as judged by USS and those who advise them. Although their accreditation as potential sites for graduate medical education may be appropriate, they are not actually serving this role. Since they attract only non-U.S.-medical-school graduates, their continued accreditation for medical education can be justified only if more physicians who will practice in the generalist specialties are required than will be provied by U.S. graduates now entering these specialties. These non-USG programs should not continue to be accredited since they use limited educational resources and distort the data on available positions.

Although there is no consensus on how many USS should be entering the generalist specialties, it would seem to be appropriate that there should be enough positions available in quality programs to match the number of USS whose first choice is in a generalist specialty. If the non-USG programs are subtracted from the total offered, the number of positions available nationally in the generalist specialties approaches the number represented by the two-thirds of USS whose first choices are for such residencies.

Despite an approximate balance between supply and demand for all positions in generalist specialty programs in the national data, the phenomenon of over 500 unmatched students whose first choice was for a generalist specialty makes it clear that regional differences are significant.

Ideally, all of the graduates from each region should obtain positions in their first choice of specialty, and the number of USS entering the GME-1 programs in each region—those retained from the schools in the region plus those recruited from schools in other regions—should be approximately equal to the number of graduates from the medical schools of the region. Actually, as has been noted, 89 percent of USS obtained a position in the specialty of their first choice in NIRMP in 1977. Furthermore, the number of graduates who entered the GME-1 programs in the generalist specialties in the New England region exceeded the number of graduates from that region who entered the generalist specialties nationally by 11 percent, Southeast by 8 percent, Mountain by 17 percent, Southwest by 62 percent, and Northwest by 13 percent; but the other five regions sustained net losses at the interface between undergraduate and graduate medical education.

The adequacy of a given number of positions in each region is difficult to assess because of differences in number of graduates, differences in the desires of USS to remain in a region, and the vigor of efforts to retain them.§ Despite these limitations, several regional differences in the adequacy of positions in the generalist specialties seem evident. In the Mountain and Northwest regions the fewest positions per graduate were offered and the highest percentages of filled positions and of unmatched students occurred. In the New England and Southwest regions, which had the next highest percentages of filled positions, the percentages of unmatched students were average. These four regions recruited the greatest numbers of graduates from other regions and three of the four retained the fewest numbers of their own graduates; region IX had both the highest retention and recruitment rates among all the regions. More positions might well have been offered in these four regions.

The situation was quite different in the Mideast Coast and Plains regions, which had the next highest percentages of filling of all USG programs and of those in the generalist specialties. These regions produced the greatest numbers of USS but offered the lowest ratios of positions per graduate and had the lowest total numbers of USS in GME-1 positions, low retention rates, and the lowest recruitment rates among the regions. An in-

§ A thorough study of the adequacy of numbers of positions in each region with respect to student choices would require a comparison of the location and type of the position actually obtained by each student with the location and type of each program on the student's NIRMP rank order list. All that can be inferred about the location of the program actually obtained is that it was at least acceptable to the student.

crease in the number of positions that are attractive to USS in these regions would seem to be desirable.

The GME-1 positions offered in the New York-Jersey, Southeast, Midwest, and Midsouth regions were less well filled. Both the total numbers of positions offered and the number per graduate were low in the Southeast and Midsouth regions. In each of these four regions the retention rates for their own graduates was average or above, but their recruitment rates from other regions were quite low. In these regions increased numbers of positions which will attract U.S. graduates from other regions and still higher retention rates for graduates of their schools are necessary.

A marked contrast was found between the filling of the positions offered in the generalist specialties and the filling of positions in other specialties, with little differences among the regions. USS filled only 44 percent of all of the positions offered in the support specialties, and over one-third of the positions offered were in non-USG programs. In general surgery only 62 percent of all positions offered were filled by USS, and 18 percent of the positions offered were in non-USG programs.

The problem of the adequacy of the numbers and kinds of first-year residencies is thus quite complex. Regional and local study and action will be required to provide adequate and appropriate positions for USS in graduate medical education. As long as the trends of choices exhibited by USS for types of residencies during recent years continue, it would seem unlikely that even by increasing the numbers of USS would the positions offered in the support specialties and in general surgery be filled adequately. Since the offering of these positions represents a need for professional personnel to render patient services, various other approaches to meeting the problem of service needs should be developed; among the options which might be considered are the employment of nurse-clinicians, assistants to physicians, and salaried house physicians (3).

Nonparticipation of some students and some programs continued in 1977. Some students did not apply initially or withdrew because of January to March graduation, to go into the armed forces, to negotiate along with their spouses outside the program, to accept a position in a nonparticipating hospital, or to accept a position in a participating hospital in a program which did not participate. Some programs in the smaller specialties offered their first residency year at the GME-2 level, while other programs in the same specialty offered their first year of residency to graduating students through the NIRMP. Several major programs in psychiatry continued to offer their GME-1 positions outside the match.

Programs which do not participate commonly require contracts from students at the beginning of their senior years or even considerably earlier. As a result, those in charge of these programs do not have the opportunity to recruit some of the excellent candidates who want to postpone their final decisions until as late as possible in their senior years; in addition, this early deadline causes considerable stress to the students who want to apply both to programs that participate in the match and also to some which do not.

In the author's view, the resolution of the problems identified in this and other studies (1–3) can best be accomplished with the leadership and conjoint action of the faculty, staff, and managers of the medical school hospital complexes that provide undergraduate and graduate medical education, accredit programs through their significant functions as members of the liaison committees, and set the standards for the specialties through their major roles in the specialty boards and societies.

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External Examinations for Internal Evaluation: The National Board Part I Test as a Case

Marcia Z. Wile, Ph.D.

Abstract—The appropriateness of the Part I examination of the National Board of Medical Examiners to evaluate second-year curricular performance of students at Case Western Reserve School of Medicine was examined. Review of the June 1974 examination by 37 faculty members revealed that 85 percent of the items reflected the content of the second-year curriculum and that 60 percent could be answered from information provided in the second-year teaching. Two-thirds of the items were related to the content of the first-year curriculum, and half could be answered on the basis of first-year material. The school's faculty used the study data in making policy-changing decisions.

The original purpose of the National Board of Medical Examiners (NBME) was to develop certification examinations for the practice of medicine which would be accepted by state licensing boards (1). Three required examinations for certification were subsequently created, two of which (Parts I and II) can be administered to undergraduate medical students. A majority of American medical schools requires that students take these examinations, and the results are used for promotion and/or graduation purposes (2). This use of the NBME examinations has expanded the role of the NBME to include the evaluation of undergraduate medical education programs (3).

Although the NBME examinations have been used to measure the effectiveness of medical school curricula, few studies have been reported regarding the congruence of these examinations with an individual school's curriculum. The NBME conducted a study in 1968 to determine the relevance of the Part I examination to current curricula of U. S. and Canadian medical schools. Ninety percent of the items were considered to represent knowledge appropriate for the basic sciences, and 65 percent of the items were determined to contain essential content (4).

Medical school faculty at the University of Minnesota participated in an investigation to assess the relationship between a NBME Part I examination and the school's basic science curriculum. The results indicated a consistency of most of the items from this one examination with the curricular content. The reviewers accepted the content of the NBME examination as a standard by which to evaluate their curriculum (5).

In this paper the author describes a study in which the NBME Part I examination was reviewed in terms of its relationship to the curriculum of Case Western Reserve University (CWRU) School of Medicine and to the performance of first- and second-year students there. CWRU students have been required to take NBME Part I and Part II examinations since the introduction of interdepartmental organ systems teaching in 1952 (6). Initially, students took Part I at the completion of their basic science activities in the third year and Part II at the end of the fourth year. The faculty wanted to determine whether the students could qualify on a national certification examination created by an external independent agency. Scores were recorded but were not used for promotion or graduation decisions. With the curricular revision of 1968 came a change in the use of the Part I examination. The basic science curriculum was shortened to two years, and the students were required to take Part I at the end of the second year. Part I served as the school's second-year comprehensive examination, and results were used to determine promotion to the third year. This examination functioned as an internal evaluation for promotion purposes in addition to an external examination for certification purposes.

In 1970 the NBME changed its policy to permit students to take Part I at the end of the first year (7). Between 1971 and 1974, 56 percent of the first-year students who took Part I passed the examination. These students entered the second year of medical school having passed the comprehensive examination without having experienced the second-year curriculum. Since a considerable number of first-year students could pass the Part I examination, its appropriateness as a means of internal assessment for the second year was questioned.

This concern about the NBME Part I examination as an evaluative instrument resulted in a pilot study conducted by the author in 1974. Eighteen faculty reviewers considered 75 percent of the items in the June 1973 NBME Part I examination to be related to the second-year curriculum. Information sufficient to answer 53 percent of the items was provided in the second-year teaching. An expanded study the next year was designed to answer the following questions:

1. To what extent does the NBME Part I examination correspond to the content of the first-year (Phase 1) and the second-year (Phase 2) curriculum of the CWRU School of Medicine?
2. To what extent does the teaching in the Phase 1 and Phase 2 curriculum provide information necessary to answer the items in the NBME Part I examination?
3. What is the level of performance of first-year and second-year CWRU medical students on all items reviewed?

Method

The seven subtests (anatomy, behavioral sciences, biochemistry, microbiology, pathology, pharmacology, and physiology) of the June 1974 NBME Part I examination were reviewed by 15 Phase 1 and 22 Phase 2 faculty members representing all subject committees (interdisciplinary teaching units) of the first two years. Each person judged every item as being relevant or not relevant to the content of his particular subject committee. If the item was related to the subject committee's content, the reviewer indicated one of the following:

1. Whether information necessary to answer the item was taught in the subject committee he represented.
2. Whether information necessary to answer the item was not taught in his subject committee.
3. Whether the reviewer did not know whether information necessary to answer

Dr. Wile is assistant professor of medical education research at Case Western Reserve University School of Medicine, Cleveland, Ohio.

the item was taught in his subject committee.

The reviewers were requested to identify those items which they considered to be ambiguous or trivial or had an incorrect answer indicated. Phase 2 faculty members were also encouraged to specify areas taught in their subject committee which were not tested by this particular NBME examination.

Individual faculty reviews were summarized to generate a final judgment for each of the 988 items of the total test. If at least one faculty member considered the item to be relevant, it was categorized as relevant. If at least one reviewer indicated the relevant subject was taught, the item was classified as being taught. Each item was assigned to one of four categories: not relevant, relevant and taught, relevant and not taught, and relevant and don't know whether taught. Assignments were summarized for Phase 1 items, Phase 2 items, and combined Phase 1 and Phase 2 items.

Examination performance of the 121 CWRU second-year students (class of 1976) and the 16 CWRU first-year students (class of 1977) who had taken this examination was obtained from the NBME, which reported the percentage of correct answers on each item for the local groups and the national reference group. Total test and subtest mean scores obtained by first-year and second-year students were calculated for Phase 1 and Phase 2 items assigned to the four categories, and comparisons were made between the first-year and second-year students' performance.

Results

The number and percentage of total test items which were assigned to each category are reported in Table 1. Approximately two-thirds of the items were related to the first-year curriculum and 85 percent were related to the second-year material. Information necessary to answer 51 percent of the items was taught in the first year, and 60 percent of the items could be answered based on instruction provided in the second year. Overlap occurred because of the nature of organ systems teaching in which some second-year material builds upon first-year content. When the reviews of the Phase 1 and Phase 2 faculty were combined, approximately 97 percent of the items were related to the content of one or more Phase 1 or Phase 2 subject committees, and it was concluded that material sufficient to answer 85 percent of the items was included in the curriculum of the first two years.

The proportion of items in each of the seven subtests which were related to the content of Phase 1, Phase 2, and the combined Phase 1 and Phase 2 curriculum was determined and is summarized in Table 2. More items were associated with the Phase 2 subject committee content and were given curricular emphasis. The greatest representation was in physiology, followed by pathology and anatomy, and the least was in microbiology.

Phase 2 reviewers listed topics taught in their subject committees which had not been covered in the NBME examination. Among the identified topics were head and neck anatomy and neuroanatomy, child development and adult psychopathology, valvular disorders, esophageal and intestinal motility and associated pathophysiology, and mechanisms underlying development of acidosis in renal disease. The reviewers also designated those items which were ambiguous, trivial, or of poor quality. Many of these items identified by the CWRU faculty were included in the 41 items deleted by the NBME on the basis of the performance of the key validation group, which was a sample of the candidate reference group. Items which had a low percentage correct value or a low discrimination index were reviewed by NBME personnel and test committee chairmen, who then decided whether the items would be eliminated.

Mean scores were calculated for first- and second-year student performance on Phase 1 and Phase 2 items in the first three categories listed in Table 1. A *t* test for independent samples was used to compare differences in mean scores of first- and second-year students for items in each classification. The results of these analyses are summarized in Table 3.

Second-year students achieved statistically higher scores than first-year students in three categories: items relevant to the second-year content with teaching provided in the second year, items relevant to the first-year curriculum but not taught in that year, and items not relevant to the first year curriculum. The higher performance by the second-year students in the second category could reflect curricular emphasis in Phase 2, and higher performance in the third category

TABLE 1

Categorization of 988 Items in the June 1974 NBME Part I Examination According to Case Western Reserve University Curricular Relevance by 37 Faculty Members

Category	Phase 1*		Phase 2†		Phase 1 and Phase 2‡	
	No.	Percent	No.	Percent	No.	Percent
Items not relevant	315	31.9	146	14.8	27	2.7
Items relevant and taught	501	50.7	590	59.7	840	85.0
Items relevant and not taught	118	11.9	243	24.6	121	12.2
Items relevant and don't know	54	5.5	9	0.9	0	0.0

* Phase 1 refers to the first-year curriculum.
† Phase 2 refers to the second-year curriculum.
‡ Phase 1 and Phase 2 refers to the first two years of the curriculum.

TABLE 2

Distribution of June 1974 NBME Part I Subtest Items Related to Each Subtest and Taught in the CWRU Medical Curriculum

Subtest	No. of Subtest Items	Phase 1*		Phase 2†		Phase 1 and Phase 2‡	
		No.	Percent	No.	Percent	No.	Percent
Anatomy	143	66	46.2	111	77.6	130	90.9
Behavioral sciences	135	1	0.7	83	61.5	83	61.5
Biochemistry	144	111	77.1	64	44.4	130	90.3
Microbiology	136	112	82.4	24	17.6	118	86.8
Pathology	146	55	37.7	116	79.5	133	91.1
Pharmacology	140	47	33.6	75	53.6	104	74.3
Physiology	144	109	75.7	117	81.3	142	98.6

* Phase 1 refers to the first-year curriculum.
† Phase 2 refers to the second-year curriculum.
‡ Phase 1 and Phase 2 refers to the first two years of the curriculum.

TABLE 3

Comparison of Performance of CWRU Second-Year Students with CWRU First-Year Students in Selected Item Categories

Category	No. of Items	*t**
Phase 1 items		
Not relevant	315	5.81†
Relevant and taught	501	−0.87
Relevant and not taught	118	2.53‡
Phase 2 items		
Not relevant	146	−0.64
Relevant and taught	590	5.81†
Relevant and not taught	243	−0.43

* Positive *t* test values indicate higher scores for second-year students. Negative *t* test values indicate higher scores for first-year students.
† $p < .001$
‡ $p < .01$

suggests items not related to Phase 1 content could have been relevant to the Phase 2 content.

Results of t test comparisons indicated that both first- and second-year students obtained significantly higher scores on items whose content was related to the Phase 1 curriculum and taught than on items whose content was related to the Phase 1 curriculum and not taught (first-year students, $t = 7.47$, $p < .001$; second-year students, $t = 4.58$; $p < .001$). Second-year students achieved significantly higher scores on Phase 2 related and taught items than on Phase 2 related and not taught items ($t = 3.20$, $p < .01$). There was no difference in the mean scores of first-year students on items related to Phase 2, with or without teaching.

Discussion

The information generated by the faculty review of the NBME Part I examination revealed that much of what was asked was not taught in the second-year curriculum and significant areas taught in Phase 2 were not tested by this examination. Yet the NBME Part I served as the second-year comprehensive examination. This disparity between the content of the NBME examination and the CWRU curriculum influenced students to spend a great deal of time preparing for the NBME examination, and they were diverted from participating in the CWRU curriculum during the final months of the second year. Inasmuch as half of the NBME items could be answered on the basis of Phase 1 material, as many as one-fourth of the first-year students were able to pass the second-year comprehensive before they entered the second year.

The results of this study were presented at a faculty-student colloquy in June 1975. Discussion and feedback generated by this meeting resulted in two recommendations:

1. That the faculty no longer require CWRU medical students to take the NBME Part I examination.

2. That a required Phase 2 comprehensive examination be created by the faculty to be administered at the completion of Phase 2.

Following extensive discussions at two October 1975 meetings, the general faculty voted to accept these recommendations, starting with the class of 1979.

Conclusion

The review of the NBME Part I examination by the CWRU faculty had an impact in decision-making and determination of school policy. Although the NBME examinations had been required for more than two decades, there had been no systematic review of these examinations in relation to the CWRU curriculum. As a consequence of this study, the faculty recognized that the NBME Part I examination was appropriate for licensure but inappropriate for internal student evaluation. The faculty decision emphasized the fact that internal evaluation of CWRU students is the responsibility of the school's faculty and should not be left to an outside agency.

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Measuring the Medical School Learning Environment

Robert E. Marshall

Abstract—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. This shift has made evident the need for an instrument capable of assessing the significant dimensions of the medical school learning environment. This report describes how the Medical School Learning Environment Survey (MSLES) was developed to measure aspects of the learning environment relevant to student stress. Results of the first administration and plans for future projects using the survey are discussed.

Instruments assessing the learning environment in medical schools have received increased attention in the medical education literature (1, 2). This interest has been spurred by an altered conceptualization of the dynamics of student stress and its impact on learning. Early investigations in this area grew out of the assumptions of the medical model of mental illness. With stress seen as an indication of a deficiency within the student, the focus of research was to identify the set of personality traits associated with differential levels of experienced stress. This approach had one significant weakness: by emphasizing individual differences in ability to cope with the demands of medical education, the uniformity of student dissatisfaction with the high level of experienced stress was not addressed.

More recent investigators of the problem (3, 4) have emphasized an ecosystem approach which does not assume preexisting individual deficiencies to be the cause of stress. Instead, attention has shifted to the educational process as a whole, that is, to the interactions between the students and their learning environment. The ecosystem model implies that stress can be due to deficiencies within individuals, deficiencies within the environment, or interactions between individuals and the environment.

At the Chicago Medical School students reported dissatisfactions and problems of adjustment with a frequency and severity similar to those reported elsewhere (5, 6). To plan appropriate interventions in the educational program and to assess their impact, systematic measurement of students' perceptions of their learning environment was necessary. The Medical School Learning Environment Survey (MSLES) was developed for this purpose.

Mr. Marshall is a research assistant in the Department of Health Sciences Education, the University of Health Sciences/The Chicago Medical School.

Construction of the MSLES

Pace and Stern's (7) work with the College Characteristics Index (CCI) laid the foundation for later learning environment questionnaires. Hutchins (8) was the first to adapt existing instruments to the medical school context. Rothman's (1) Learning Environment Questionnaire (LEQ), one of the more recent cognitive/affective climate instruments, provided a partial basis for the MSLES. Four of the MSLES' seven scales were adapted from the LEQ: Breadth of Interest, Student Interaction, Organization (goal direction), and Flexibility (authoritarianism). Three new scales were developed from discussions with students regarding their areas of concern: Meaningful Learning Experience, Emotional Climate, and Nurturance. A description of the composition of the scales follows.

Meaningful Learning Experience—This scale assesses the degree of perceived relationship between the demands made of students in courses and the knowledge and skills perceived by students as important in becoming a physician. In discussions with the author about the difficulties medical students have in coping with the huge quantity of course work, students pointed out that their problem was not merely the volume of material. They explained that it would be easier to devote such large amounts of time to studying if the material bore more relation to their perceived needs as future physicians. Two factors were identified that would make the learning experience more meaningful: a clearer relationship between basic science and clinical material and a greater emphasis on utilizing the higher cognitive processes, specifically, understanding concepts and principles and using problem-solving skills, for example, gathering data to test hypotheses and arrive at conclusions.

The scale includes items such as: "Courses develop skills in formulating and testing hypotheses and drawing conclusions." "Students can see the relationship between what they are studying and the kinds of situations they will meet when they graduate."

Emotional Climate—This scale measures students' affective responses to the learning environment and includes items such as: "The educational experience tends to make students feel anxious." The literature on students' experiences in medical school indicated that students often react to their medical training at a basic feeling level. It was important, therefore, that the MSLES not be limited to items that call for an intellectual assessment of the relative strengths and weaknesses of the educational program.

Nurturance—The purpose of this scale is to determine the students' perception of the extent to which the school supports its students by caring or providing assistance. A number of students felt that one of the more significant aspects of the learning environment was the degree to which the faculty and administration communicated concern for students. This feature was seen as especially important because of the implications for the manner in which students learn to express support and concern for their patients. The Nurturance scale includes items such as: "When giving criticism or answering a question, faculty appear to be genuinely interested in helping the student."

As has been noted, the remaining scales were adapted from the LEQ.

Breadth of Interest—This scale assesses the degree to which the environment fosters interest and activity in medicine in the broadest sense and allows for interests outside of medicine, for example, "Faculty emphasize the personal as well as the technical aspects of health care."

Student Interaction—These items are

intended to reveal the nature of student peer-relations, for example, "Students spend time assisting each other."

Organization – This scale distinguishes between organized, purposeful, planned activity and uncoordinated, disorganized, diffuse activity, for example, "Students are able to organize course material into a cohesive whole."

Flexibility – These items assess the pattern of school control as it affects the students' learning experiences. The items distinguish between flexible, changing, open systems and closed, rigid, static systems, for example, "Curricular and administrative policies are inflexible."

ITEM SELECTION

There are 50 items on the MSLES. The survey was kept brief because medical students place a premium on their free time. It was expected that the sacrifice of reliability associated with a shorter instrument would be compensated for by students' increased attention to a questionnaire that could be completed in a relatively short time.

Approximately one-third of the items on the MSLES were new; one-third were taken directly or adapted from the LEQ; one-third were taken directly or adapted from other instruments (7, 9-12). The latter items were selected by the author according to the following criteria: clarity, absence of emotionally charged words, and direct relevance to the medical school setting.

In order to reduce response set, about one half of the items describe undesirable characteristics; for example, "Students' anxiety hinders them from achieving up to their full potential." Three faculty members from the Department of Health Sciences Education at the Chicago Medical School independently rated the characteristic described in each item as desirable (positive) or undesirable (negative). Items were included in the survey only if the three faculty members' ratings agreed. The scores for negative items were reversed when computing the scale scores; thus, a "high" response to a negative item was made equivalent to a "low" response to a positive item.

Some of the scales were seen as assessing more complex institutional characteristics than others; thus, the number of items comprising each scale was not uniform. The range was from 10 items for the Organization scale to 4 items for the Breadth of Interest scale.

Since problems of adjustment to the medical school learning environment are more frequent and severe in the initial years of medical training, the MSLES was directed toward problems and concerns typical of the basic science years.

RESPONSE FORMAT

As the MSLES was developed, attention was given to avoiding the contamination of responses by a "desirability halo effect." Mitchell (13) argued that students' responses on environmental surveys are often shaped to be consistent with their global impressions of their school. He suggested that one of the reasons for the existence of a halo effect is that students are asked to make judgments on the basis of insufficient evidence. When students tend to choose responses that are most in accord with their general perception of the environment on the desirability continuum, the learning environment instrument is measuring only one dimension of the learning environment rather than the set of dimensions that it was designed to measure.

To minimize this effect, a response format was used for the MSLES that departed from the typical disagree-agree answers in two ways. First, a response choice, "insufficient information," was offered. Second, instead of responding

to statements along an agree-disagree dimension, students were asked to indicate the frequency with which they experienced the behavior or attitude in each item. It was expected that by formulating their responses in terms of frequency of occurrence rather than in terms of strength of opinion, the students might be less influenced by underlying attitudes toward the school. Students were given a four-point scale from which to select their response: seldom, occasionally, more-often-than-not, and very often.

The second section of the MSLES provided the means to check for the presence of a halo effect. In this section the students rated the desirability of each item from −2 to +2. A significant correlation between "perceived frequency of occurrence" and "desirability" suggests a tendency to respond in terms of underlying attitude toward the school. The correlation may also be viewed as an indication of the degree to which the school meets the needs identified by students as being most important.

Method

The study took place at the University of Health Sciences/The Chicago Medical School. Pilot work was conducted in three allied health science programs: physical therapy, radiological science, and medical technology. After the MSLES was administered and scored, discussions were held with students and faculty in these programs. The results were presented, and students and faculty gave feedback on the validity and usefulness of the instrument. These discussions led to editorial changes in items that were ambiguous and elimination of items that did not tap a significant feature of the learning environment. Then, toward the end of the 1975-1976 school year, the first-year medical students filled out the MSLES. Students not in attendance during the initial administration were contacted by mail and asked to fill out the questionnaire. In all, 93 students returned the questionnaire (approximately 75 percent of the class).

Results

Since this was the first administration of the MSLES, various means of determining reliability were used. The following reliability analyses refer to the perceived frequency section of the MSLES.

Cronbach's (14) alpha was used to determine the internal consistency of the whole survey and the seven individual scales. Cronbach's alpha is similar to the Kuder-Richardson 20 except that it is not limited to dichotomous variables. The original form of the MSLES had 56 items. Six items had low item-scale correlations and were dropped from the survey. The reliability of the whole survey using the remaining 50 items was .92. The reliability of the individual scales ranged from .85 for Emotional Climate to .70 for Breadth of Interest, a scale consisting of only four items. Split-half reliability was used as an additional index of the degree to which the MSLES was consistent in the response it evoked within individuals. The Pearson product-moment correlation (r) between a student's mean score for all the even items and all the odd items was .86.

Another indication of the reliability of the MSLES was the degree of agreement between two independent samples. The sample of 93 students was randomly divided in half (on the basis of whether their survey had been assigned an odd or even number) creating two independent samples. The mean for each item was computed separately for each group. Over the 50 items the correlation (r) between the item mean for the odd students and the item mean for the even students was .93. There also was consid-

erable agreement between the responses given on the first administration and the responses to a second administration given six months later to the succeeding freshman class. The correlation (r) between the item means for the two administrations was .82.

SCALE MEANS

The scale means and standard deviations are presented in Table 1. The relative strengths and weaknesses in the learning environment are reflected in the range of scale means on the perceived frequency section of the MSLES. The range was from 1.9 (meaningful learning experience) to 2.8 (nurturance). The mean for all 50 items was 2.3.

The homogeneity of the scale means from the desirability section of the MSLES is apparent in Table 1. The desirability of the characteristics expressed in the items comprising each scale was uniformly high. The range of desirability scale means was from 1.3 to 1.6. The mean for all 50 items was 1.5. The correlation between the perceived frequency and desirability ratings of each item was not significant.

VALIDITY

Cronbach (14) states that the approach used to assess a test's validity is best determined by the type of inference for which the test will be used. The MSLES was designed to delineate significant dimensions of the medical school learning environment. Content validity would, therefore, appear to be an applicable criterion; that is, "Do the items truly sample the most salient features of the learning environment?"

New items on the MSLES were added in response to issues raided by students and faculty in informal discussions, and the uniformly high desirability ratings of the seven scales confirmed that the items tapped important dimensions of the learning environment.

The patterns of strengths and weaknesses produced by the MSLES paralleled reports in the literature of students' experiences and concerns at other medical schools (3, 4). This similarity provided further evidence of the test's content validity.

The differences among the means of the seven perceived frequency scales supported the argument that the students are, in fact, responding to the content of the individual items comprising each scale. The nonsignificant correlation between perceived frequency and desirability also indicated that the students were not merely responding in terms of a global attitude or "halo effect."

Finally, there were indications that the MSLES was sensitive to differences among educational programs. At the time that the MSLES was administered to students in the three allied health sciences programs, one of the programs was undergoing major changes, including a change in its director. Another program, in contrast, was known for the high quality of its teaching, organization, and commitment to students. The second program scored higher than the first on all seven scales. The mean on the whole test for the first program was 2.6 compared with 3.2 for the second program.

Discussion

Baird (15) discussed various functions of surveys which measure university environments. He distinguished between instruments that yield general knowledge and those used for input in a decision-making process. Ultimately, the MSLES will serve both functions. At this point the instrument has been used only in an initial attempt to describe the learning environment within a medical school. The analyses from the first administration indicated acceptable levels of reliability and validity. Repeated administrations over the course of a school year will yield further information about the stability of students' perceptions. Comparative data from other medical schools will provide a greater understanding of the significance of specific scale results and allow for interpreting scale scores in terms of strengths and weaknesses. The MSLES is also suited for studies examining the relationship between satisfaction with the learning environment and academic performance. With the accumulation of such knowledge, it will be appropriate to use the MSLES in an ongoing process of decision-making and evaluation. Students' responses to the MSLES should suggest possible interventions to improve the learning environment. The impact of these interventions could then be measured by subsequent administration of the MSLES.

A final area for further development of the instrument will involve expanding its scope in two ways. First, items addressing the problems and concerns of the clinical years will be added. Second, faculty and administrators will be surveyed to ascertain significant features of the learning environment that are currently omitted, especially those characteristics not necessarily related to the problem of student stress.

TABLE 1
Results of the First Administration of the Medical School Learning Environment Survey to 93 First-Year Students at the Chicago Medical School, April 1976

Scale	Perceived Frequency*		Desirability†	
	Mean	S.D.	Mean	S.D.
Nurturance	2.8	.53	1.5	.35
Student interaction	2.6	.58	1.3	.40
Organization	2.5	.44	1.4	.39
Flexibility	2.5	.57	1.4	.40
Emotional climate	2.3	.57	1.6	.35
Breadth of interest	2.0	.57	1.5	.42
Meaningful learning experience	1.9	.47	1.6	.34

* Scale: 4 = very often, 3 = more-often-than-not, 2 = occasionally, 1 = seldom.
† Scale: +2 = very desirable, +1 = desirable, 0 = neutral, −1 = undesirable, −2 = very undesirable.

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Participation of House Staff in Group Practice: Experience at a Tertiary Care Center

Patrick S. Pasquariello, Jr., M.D., Mary D. Ames, M.D., and Herbert S. Lustig, M.D.

Abstract—In order to improve patient care, provide better teaching in an ambulatory setting, and establish research opportunities for faculty staff, the medical clinic of the Children's Hospital of Philadelphia has been developed into a group practice. The entire house staff is involved in this project, and it appears that the endeavor has resulted in improved patient care and house officers who are better prepared for outpatient problems. Some of the difficulties are discussed.

The Medicare and Medicaid amendments to the Social Security Act provided for increased services to the medically indigent. This imposed an obligation on training programs to maintain the mandated services for the designated beneficiaries. The implications of this legislation were such that teaching institutions had to reevaluate their ambulatory services so that comprehensive medical care could be provided to the community. At the same time proper teaching for house staff and educational research opportunities for faculty had to be ensured.

The administrators of the teaching program of the Children's Hospital of Philadelphia designed an outpatient clinic as part of a group practice. It is anticipated that through the clinic the hospital can provide comprehensive medical care for the community, improved outpatient training of house staff, and a source of research material for the faculty. This appears to be the first instance of an entire house staff being included in such a project, although in various programs throughout the country individual house staff members have been included in group situations (1–3).

Since the inception of the group practice concept at the Children's Hospital in July 1973, the house staff of 60 doctors has been divided into five groups, designated "A" for Monday through "E" for Friday. Each group includes house officers of each pediatric training level (first year of training [PL-1] through the third year [PL-3]) and has an administrative staff. The house officers are assigned to and remain in the same group until completion of their training period at the Children's Hospital. The house officer attends the medical clinic on the same afternoon of the week throughout the training program and so can easily indicate to his patients when he is available. This enhances continuity of care.

Dr. Pasquariello is associate professor of pediatrics at the Children's Hospital of Philadelphia. Dr. Ames is director of ambulatory services at the Children's Hospital of Philadelphia and professor of pediatrics at the University of Pennsylvania School of Medicine, and Dr. Lustig is assistant physician at the Children's Hospital of Philadelphia and associated with the Philadelphia Child Guidance Center.

Administrative Staff

The administrative staff consists of a group leader who is a geographic full-time staff member of the Children's Hospital involved in the general practice of pediatrics, pediatricians in the general practice of pediatrics in the community, and a qualified child psychiatrist. A social worker is available at all times. Nursing and secretarial staff serve all the groups.

The group leader's responsibilities include the supervision of the overall care of the patients in the group, consultation for the house officers, direction of the conference prior to each clinic, and management of logistical and administrative problems. Each chart is audited by the group leader or his representative, and difficult cases are discussed with individual house officers.

Group leaders meet each month to discuss inpatient and outpatient services and to exchange ideas for providing better patient care. In addition, they coordinate the evaluations of house staff performances that are made periodically by the attending staff physicians. These results are subsequently discussed with individual house officers.

The community pediatricians attend the conference prior to each clinic and discuss their experience in handling office situations. They are available for consultation to the house staff during the clinic and provide direct patient services when there is a patient overflow.

The psychiatrist is a participant in the pediatric-liaison project of the Children's Hospital and the Philadelphia Child Guidance Clinic (4). He provides an opportunity for on-the-spot consultation regarding the emotional and psychological aspects of disease; in addition, he teaches the house officers interviewing techniques and methods of intervening in situations that might produce an emotionally unstable family constellation. He is available to the members of the group by telephone for problematic situations that might arise at times other than clinic hours.

The psychiatrist contributes to the educational program by using videotaping and direct observational techniques. Two office visit sessions are recorded for each house officer of the PL-1 level. The first occurs during the early months of his training period and the second approximately six months later. On each occasion the videotape is reviewed by the group leader, the psychiatrist, and the house officer. Suggestions and comments are made regarding interviewing techniques and physical examination skills. The two sessions are compared, and the house officer's progress is determined. The initial response of the new house officers to the videotaping sessions is often one of uncertainty and suspicion, but these feelings are usually altered at the time of the discussion of the case. The second videotaping session is often recorded with zeal and confidence. The house officers have learned to appreciate this teaching technique and will often ask to have a difficult case recorded so that it might be more thoroughly discussed with the staff. These results are in accordance with those found by Stoeckle and colleagues (5). The second-year house officers also are instructed by the psychiatrist. He visits each house officer's office as a silent observer in order to criticize constructively the house officer's interviewing techniques after the session has concluded. These observational visits are made at least twice during the year.

House Officer Staff

The house officer staff consists of members of each training level. When a house officer's group is serving in the clinic, his prime responsibility is to the clinic and not the service to which he is assigned.

The PL-1 officers assume responsibility for the medical care of the patients of those house officers in their group who left the institution the year before, thus providing patients with group continuity although the physician himself changes. In most instances this assures that the patient is cared for by the same physician for a maximum of three years. The PL-1 physician is also assigned well babies, preferably six weeks of age, and patients for follow-up from the inpatient services and emergency room. Patients with diagnostic problems are assigned as well as those requiring preoperative, school, and routine yearly examinations. Return patients are scheduled at 30-minute intervals, and new patients are allotted one hour. A maximum of six patients are scheduled by the appointment clerks unless the house officer makes special arrangements.

The PL-2 house officers are also assigned to well babies but are given more difficult and complex medical and emotional cases. One hour is allotted for patients with these complicated problems, and the house officers are encouraged to use several visits to complete the patient workup in order to utilize their time efficiently and to see their full schedule of patients. Usually seven patients are scheduled for these house officers during each clinic session unless previous arrangements are made to see more patients at the discretion of the house officer. Follow-up patients from inpatient units which require the service of more experienced physicians (for example, intensive care units and the clinical research center) also contribute to the PL-2 physician's patient complement.

PL-3 physicians are assistant chief residents who are responsible for the supervision of patient units and those house officers who are participants in the ambulatory fellowship program. This level physician is given eight of the most complicated medical and emotional cases each clinic session. When these house officers are on inpatient services, they are not given the full complement of patients since the demands of supervising these units often interfere with the adequate evaluation of problematic situations. The PL-3 physicians also act as consultants to the PL-1 and PL-2 house officers.

Each group ("A" to "E") is composed of approximately 12 house officers, most of whom are on the PL-1 and PL-2 levels. The limited number of patients seen by each house officer during clinic sessions reduces the emphasis on service and allows more time to be devoted to teaching. Formerly, the service function took precedence over teaching, and as a result the clinic provided a less than optimal learning experience.

The house officer occupies the same office each week. This is found to be necessary since patients and parents seem to identify their doctor by the particular office he occupies. His name is placed both at the head of the corridor in which his office is located and on the door of his office. Each office has the standard equipment and supplies. Each corridor has a treatment room and a supply room where immunizations and other needed materials are kept. A small laboratory is available for the use of those in clinic.

Patient Population

The patient population of the group practices is derived from many sources. Patients admitted to the hospital on inpatient services who were not previously members of one of the group practices become members of the group practice of the house officer to which the patient is assigned. The medical management of this patient is the direct responsibility of that house officer's group leader. When

patients who are members of a particular group are admitted to the inpatient services, they are treated by a house officer of that group. When this is not possible, the house officer who follows the patient regularly in clinic is notified, and he maintains contact with the patient and his parents during the hospital stay. Arrangements for posthospitalization care is then made with that house officer.

Well babies are referred from the nurseries of hospitals affiliated with the University of Pennsylvania School of Medicine, neighborhood clinics refer patients with medical problems, and local schools refer children with learning disorders. In addition, community physicians refer patients with complex problems for consultation. In these instances the house officer contacts the referring physician by telephone and then follows up with a full written report.

Each patient is issued a plastic identification card indicating the group's identifying letter. Parents are encouraged to remember the name of their child's doctor and request that he be called if the patient is brought to the emergency room with an acute illness. If this physician is available, he will take care of the child. If this is not possible, the patient is treated; and follow-up is arranged with the patient's own house officer during his clinic session.

Parents of the patients are instructed to telephone their child's physician during the regularly scheduled clinic for results of laboratory studies and progress reports. They are also urged to call their physician for any acute illness or any concerns that may arise during the remainder of the week. If a specific physician is not available, calls are referred to the house officer on duty in the emergency room. Telephone contact with the child's physician often proves adequate to handle simple situations, thus eliminating multiple unnecessary clinic and emergency room visits.

Since the group practice concept was a new one in the community, there was a period of poor acceptance. This was evidenced by an attendance rate of 35 percent of those who actually kept their clinic appointments. At the end of four years this figure had increased to 68 percent.

The patient population provides useful material for educational research projects conducted by members of the faculty, such as the Lead Poisoning Prevention Program and the Sickle Cell Screening Program.

Consultation and Conferences

Consultation by subspecialists are usually obtained during the time of the clinic visit. This has two advantages: first, the patient does not have to return weeks later for a specialty clinic visit; second, the consulting physician provides the house officer with a first-hand learning experience. In instances in which consultation is not possible during the clinic visit, appointments are made for the specialty clinic, and the house officer whose patient requires consultation is encouraged to attend this clinic with his patient. Specialty clinics are held during the morning so as not to interfere with the afternoon clinic session set aside for each group.

Group conferences are held prior to each afternoon group clinic to discuss difficult cases, topics that are not usually encountered or stressed during inpatient teaching programs, or the management of disorders that require outpatient care. Each conference session has a prearranged topic so that a lively discussion is facilitated. The pediatricians engaged in private practice are especially helpful in these sessions, and the child psychiatrist

flavors the discussions with his views and suggestions.

Discussions and Conclusions

When the group practice concept was instituted at the Children's Hospital of Philadelphia, it was necessary to alter the poor image that was synonymous with "medical clinic." Formerly, the clinic rotation had been frustrating to house officers because of the low proportion of patients who kept appointments, the large number to be seen, and the absence of continuity of care. There was little teaching, and supervision of house officers was often relegated to junior staff physicians, many of whom were part-time practicing physicians. Similarly, those responsible for the organization of the ambulatory pediatric training programs had found them to be tedious and unrewarding.

In order to create interest and enthusiasm in the group practice, the following changes were instituted. The group leaders were chosen from the full-time senior staff whose major interest was in the field of general pediatrics. These physicians are present within the hospital confines during most of the day and thus can be available to members of the group at all times for discussion and consultation of inpatient and outpatient cases.

As has been noted, it was felt that the medical clinic should be considered a teaching experience rather than one which solely provided services; therefore, the number of patients to be seen during each clinic was limited. This produced a serious backlog of clinic appointments for new patients and those returning for follow-up visits. To alleviate this situation, another group (Group 6) was formed. This group is composed of trained pediatricians who are hired on a part-time basis to provide complete and comprehensive care for the patients they service and who are compensated on a fee-for-service basis.

Another source of concern was the reluctance on the part of the house officer to leave his primary service in order to attend the clinic. Now it is stressed that when the group clinic is in session, it has priority over all other duties, and the care of the patients on other services is the responsibility of the other house officers assigned there. Rotations are determined by computer methods so that usually no more than one member of a group is assigned to a particular service at any one time. On the rare occasion that two group members are on the same service and attend the clinic at the same time, they alternate in the clinic every other week. House officers assigned to critical areas such as neonatal intensive care units or newborn nurseries are not excused from the clinic, and the other house officers on those services are responsible for medical coverage there.

The group practice concept has generated enthusiasm among the house staff. An esprit-de-corps has developed among members of each group which has resulted in better trained house officers and improved patient care.

By providing continuity of care, house officers have been exposed to a variety of situations which are difficult to manage; but the availability of consultative assistance allows them to sort out and solve these problems (6). Continuity of care also enables the house officer to be better acquainted with the dynamics of the families of his patients. It has been shown that a physician is less likely to hospitalize a child if he is confident that the parents can handle a particular problem. This benefits the system, the child, and the family.

In addition, continuity of care permits the parents and child to identify with a specific physician. Objections have been

raised that short periods of continuity of care are not valuable; but the availability of the same group physician to a particular family over a period of one to three years represents a significant contrast to the episodic, fragmented, and impersonal care received by patients prior to the establishment of the group system.

Practicing pediatricians continually encounter complex and difficult medical and emotional situations. They frequently are frustrated by their inability to coordinate the care of an especially difficult problem or frequent referral to secondary or tertiary care centers. It is expected that exposing house staff members to various medical and emotional problems, both actually and hypothetically, will teach them how to manage these problems. If the frustration level of practicing physicians can be lowered, there may be a decrease in the excessive number of U.S. physicians leaving the practice of medicine.

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Medical Students' Orientation Toward the Chronically Ill

Nancy G. Kutner, Ph.D.

Abstract—Medical students receive little training specifically directed toward care of chronically ill persons, and physicians, therefore, tend to have little knowledge of alternative long-term care arrangements. Moreover, the negative attitudes toward chronic patients which were observed by Becker in the 1950s still seem prevalent among medical students. Little interest is expressed by medical students in fields which focus on the chronically ill or aged. Restructuring of medical education is necessary in order to promote more concern among physicians with the needs of the chronically ill.

Physician ambivalence with respect to treating chronically ill patients was identified by sociologist Robert Merton (1) 20 years ago. According to Merton, an "ideal norm" of the medical profession is that physicians should not prefer one type of patient over another, but the "real norm" is that the most rewarding experience for the physician is the effective solution of a patient's health problems—resulting in physician preference for patients who respond well to therapeutic efforts. Because of the dramatic shift since 1900 in the nature of major disease categories in our society, however, this preference among physicians creates a serious health problem.

In 1900 the major diseases were primarily infectious, for example, influenza, pneumonia, and tuberculosis; but by the 1970s, and even as early as 1940, the major diseases were chronic or noninfectious, for example, heart disease, cancer, and stroke. Chronic health problems now affect a large segment of the U.S. population. The National Center for Health Statistics (2) estimates that there are currently more than one million beds in skilled nursing homes and extended care facilities, and an additional 26 million noninstitutionalized persons suffer some limitation of activity due to chronic disease or impairment.

Increased longevity of persons with chronic health problems, in addition to a growing proportion of elderly population in the United States, requires evaluation of alternative systems of long-term care and the active interest of the medical professional in such evaluation. However, physicians themselves have acknowledged that "most practicing physicians have little experience with the range and types of possible long-term care settings, including the type of services that may be available to assist a person to remain in his own home" (3). There are not enough physicians specifically trained to deal with the needs of chronically ill

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Dr. Kutner is assistant professor of rehabilitation medicine (medical sociologist) at Emory University School of Medicine, Atlanta, Georgia.

persons, and persons receiving care frequently are not appropriately placed so they will receive the type of care they really need.

An even more basic problem is an ambivalent or even negative attitude on the part of physicians toward chronically ill and elderly patients. This attitude seems to be acquired as part of the socialization experience of students in medical school, judging from Becker's (4) classic study, a medical student's journal of his clinical rotation experiences (5), and observations by the author during interviews conducted in 1975–76 with students enrolled in Georgia's two medical schools. Negative attitudes toward the chronically ill have been observed among interns (6) as well as among undergraduate medical students. In addition, it has been suggested (7) that physicians' reluctance to get too involved with the field of geriatrics, and their preference for treating younger people for whom "happy" outcomes can be projected, "is really rooted in the denial of their own aging." Such attitudes further contribute to physicians' reluctance to take an active role in the provision of long-term care needed by the chronically ill and aged.

Students' Specialty Interests

Becker's (4) observations of medical students at the University of Kansas School of Medicine in the mid-1950s suggested that student attitudes toward patients were largely drawn from two sources. The first source Becker termed "student culture" (perspectives developed by students which helped them cope with their particular status in medical school); the second source he termed "medical culture" (ideas which are part of the general culture of the medical world). Some attitudes described by Becker deal specifically with the chronically ill patient, sometimes referred to as a "crock" by the students he studied. Physicians' preferences for dealing with acute, as opposed to chronic, health problems were viewed by Becker (4) as a widely shared facet of medical culture: "where the physician's work does not afford (at least in some symbolic sense) the possibility of saving a life or restoring health through skillful practice or losing them through ineptness, the physician himself lacks some of the essence of physicianhood. This perspective . . . furnishes a basis for classifying and evaluating patients; those patients who can be cured are better than those who cannot." A related idea drawn from student culture was the distinction between the acute stage of illness as "interesting" and educational for students and the long convalescent stage which generally "produces no new increments of information or clinical experience" (4).

Another widely shared sentiment which seemed to be drawn from medical culture was distaste for patients who were judged to be directly responsible for their own illness; students may "feel little sympathy for patients who become diseased as a consequence of their own actions or neglect" and may "think that patients who do not follow medical advice more or less deserve what they get" (4).

These attitudes toward chronically ill patients are apparently still a part of the value system absorbed by students in medical school. As noted earlier, during academic year 1975–76 the author directed a study of medical student careers; subjects were 338 students enrolled in Georgia's two medical schools, Emory University School of Medicine and the Medical College of Georgia. Equal numbers of women and men were included in the study. Because of the investigators' particular interest in female medical student careers, an effort was made to contact every woman currently enrolled in the two medical schools; and an equal number of men were randomly selected. Personal interviews were conducted by the author and two research assistants with the majority of subjects; 80 first-year students, who had only been exposed to medical school for four months, completed a self-administered questionnaire which was adapted from the interview schedule and requested similar information.

Dislike of patients with chronic problems requiring long-term, follow-up care was frequently mentioned by Georgia medical students as a negative aspect of specializing in internal medicine or family practice—despite the marked popularity of these two fields at both medical schools. Some students had seriously considered entering internal medicine or family practice but decided against these fields because of the frustration of not being able to cure patients and because of the long-term care required. Instead, these students chose fields such as pediatrics in which you can work with happy patients; surgery, in which you can "fix something" and make patients well; or anesthesiology, in which patient care is short term. Even students who decided to specialize in internal medicine admitted that the inability to cure and the chronic nature of many of the diseases with which the physician must deal had discouraged them from choosing that field, and it was clear that they were not looking forward to this aspect of their future practice.

An additional parallel to Becker's study was the finding that chronically ill patients were frequently viewed by medical students as largely responsible for their health problems and likely to be poor compliers with the physician's directions and advice. People who "abuse their bodies" by such behavior as eating too much, smoking too much, or drinking too much were negatively viewed; moreover, such people were expected to go out and do the same things again after being treated by the physician. By contrast, children were regarded by many students as much more innocent and acceptable patients. Students who expressed this view were, understandably, strongly drawn to pediatrics as a field in which to specialize.

Of the students sampled at the two medical schools in Georgia who had made a definite selection of an area in which to specialize (primarily fourth-year students), none had selected a field such as physical medicine, geriatrics, rheumatology, or nephrology which focuses on chronic health problems requiring long-term care.

Students were asked, at the beginning of the interview or questionnaire, to indicate in order of interest the four specialties in which they were most interested in terms of their career in medicine. Among the 338 students sampled at the two schools, three mentioned rheumatology, two mentioned physical medicine, two mentioned geriatrics, and one mentioned nephrology as specialties in which they were interested. These four specialties were in no case the student's first interest, however. For the two students interested in geriatrics (a first-year man and a fourth-year woman), this field was their second area of interest after internal medicine. There is a good possibility that the two students interested in geriatrics will devote considerable time to caring for geriatric patients, since they viewed both geriatrics and internal medicine as involving heavy patient contact and exposure to a wide variety of problems and diagnostic challenges. There also seemed to be a good possibility that a first-year woman interested in physical medicine might specialize in this area, since she named physical medicine as her second area of interest and also indicated that she was impressed with the use of "bio-

feedback" in rehabilitation because of its emphasis on patient "self-help." For the five remaining students, however, the possibility of their practicing in the fields of physical medicine, rheumatology, or nephrology seemed rather remote, despite their expressed interest in these areas.

Internal medicine (straight medicine excluding subspecialties such as cardiology or neurology) and family practice were named by 40 to 50 percent of the students sampled at both schools as their preferred fields of specialization. Reasons for these preferences clearly did not include the prospect of working with chronically ill persons. When asked to indicate what features of their preferred specialty most attracted them, students leaning toward internal medicine were most likely to cite the challenge of diagnosis. Students drawn to family practice were intrigued with the possibility of total patient care and of working with whole family systems.

Ward experiences during the student's clinical years no doubt reinforce the values to which students are exposed in both the medical and student cultures. John MacNab, writing under a pseudonym about his experiences as a third-year medical student, described his rotation through internal medicine (5). Like a number of the Georgia medical students interviewed, MacNab was increasingly demoralized by the amount of repetitive "scut work" and especially by the seeming futility of his efforts to help old people who had a "catalogue of afflictions" and people who "eat too much, drink too much, smoke too much, and exercise too little." He concluded that "most admissions demand a lot of work with very little teaching in return," and, in short, "it looks as if this field has fewer satisfactions than most others" (5).

Modifying Students' Attitudes

It is possible that certain restructuring of medical education could bring about a more positive orientation among students toward treatment of the chronically ill. Early in this century medical teaching and practice became dominated by the so-called "Flexnerian model," which stresses knowledge of the sciences basic to medicine and much attention to laboratory and diagnostic procedures (8, 9). This is still believed to be a sound model, and many medical advances are attributed to it. At the same time the Flexnerian model of medical education, which continues to prevail in U.S. medical schools, has been criticized for producing physicians "more concerned with disease than with patients, more with medical cure than with health care" (8). This kind of orientation among physicians is not compatible with the needs of chronically ill patients.

One way in which physicians could more adequately meet the needs of many chronically ill patients would be to utilize at-home patient care. Increasing attention has been given in recent years to the possibility of caring for chronically ill persons in their own homes. It is argued that an estimated 15 to 35 per cent of the elderly who are currently in institutions such as nursing homes could more appropriately be cared for at home. Home care ideally would allow the patient to remain in a supportive environment; it would also be less expensive and would avoid the disfunctional physical and psychological consequences attributed to excessive care.

Current underutilization of the home care alternative is largely attributable to physicians' lack of education about it. Home care consists of services provided by a team of medical and paramedical personnel, and there is consensus in the medical literature on the value of a team approach to the needs of patients with chronic health problems. The physician can utilize input from paramedical personnel to identify factors (for example, home environment) affecting the course of a patient's illness. However, as Schuman and Willard (10) note, "unfortunately, the role of the nurse, the social worker, or the physician associate as a 'laboratory' for confirming clinical observations and as partners in treatment has not been taught in most medical schools." A multidisciplinary team, by supplying different kinds of relevant data, can provide insight into different aspects of the patient and his illness. And it is possible, according to Schuman and Willard (10), that "the physician will be rewarded by finding challenging problems concerning prognosis that will increase his interest in chronically ill and elderly patients." As Miller (9) notes, however, "the present-day diagnosis-oriented physician too often has neither the inclination nor the training to be involved in the complicated team-oriented treatment program for his patient."

There is little indication that our system of medical education has as yet begun to turn significant attention to producing a greater number of "management-oriented," as opposed to diagnosis-oriented, physicians. Because a large proportion of the chronically ill are elderly persons, some ferment, "although extremely limited," currently exists within the medical community on behalf of introducing geriatric medicine into medical education curricula (11). Robert N. Butler, director of the National Institute on Aging, in 1976 said he believed that medical schools should offer a required course in introductory geriatric medicine, supplemented by practicums, workshops, and clinics (11). Training programs involving undergraduate medical students would have the potential of shaping attitudes toward, and developing expertise in, treatment of chronic illness and geriatric problems early in physician careers. At the present time only 32 out of 114 medical schools in the United States offer geriatrics as an elective, and none makes it a requirement for students. Moreover, as Michelmore (7) has said, few formalized programs exist in this country "where a physician can receive post-graduate training in geriatric medicine as well as in the community and institutional aspect of this special field."

Judging from medical students' attitudes toward chronically ill patients described by Becker (4) and evidenced by medical students in Georgia in 1975–76, it is important that student-physicians have the opportunity to perceive rewards in the treatment of patients who require long-term care. Physicians who are dedicated to fields such as rehabilitation medicine or geriatric medicine agree that rewards are involved, although these are much different from the "immediate results" which can be attained in an area such as surgery or emergency room medicine. Miller (9) maintains that "it is a rewarding experience for a physician to operate as the steward of a treatment program in behalf of a chronically ill patient, during exacerbations with their resultant increase in disability, through treatment in the general hospital, then in the extended care facility, and eventually in the patient's own home."

An intensive study of 27 fourth-year medical students at Case Western Reserve University (12) indicated that although students held unfavorable expectations regarding the chronically ill, their actual experience showed they could learn and could find personal satisfaction

by treating such patients. Because of the demands on medical students' time, it would be impossible for them to follow fully the progress of a chronically ill patient and thereby have the rewarding experience described by Miller (9). If, however, the student were able to play a part in the return of a patient to his own home, helping to plan for and evaluate the maintenance—even for a short period of time—of the patient in that setting, it is possible that the student would develop a desire to continue to play a role in effecting such an outcome for the chronically ill. Such an experience should serve to make more understandable the concepts of "whole patient medicine" and "comprehensive care," which sound appealing but often may seem to lack empirical referents.

Medical students have only a short period of time in which to be exposed to various specialties of medicine, each highly developed in itself. The students view their rotations during the clinical years as furnishing opportunities to see how their own personalities and interests mesh with the demands and activities involved in each of the fields. Some students are reinforced in their original inclinations, while others are surprised to find that a specialty does not entail what they had expected. Role models provided by the particular medical school can play an important part in student reactions to particular specialty areas (13). Between 40 to 50 percent of the students at both medical schools in Georgia who participated in the author's study cited interactions with faculty as having been a positive influence on their specialty preferences. Students can be significantly influenced by the way that a specialty is "presented" within their medical school; thus, much potential for communicating positive orientations toward the treatment of chronic illness does exist.

Conclusion

Despite evidence of increased interest among medical students in entering the field of family practice or family medicine (9, 14), with its emphasis on treating the whole family as an interrelated system and in truly delivering primary care by dealing with the needs of the whole person, concern for the needs of the chronically ill and aged still seems to be largely absent in medical school. The author's recent interviews with students indicated that the challenge of diagnosis remains one of the strongest attractions for the large number of students drawn toward internal medicine, and marked dislike was expressed for the "unhappy," that is, chronically ill patients they expected to encounter as internists. Little interest was expressed in fields such as geriatrics or physical medicine. All of this suggests that the care of chronic patients will continue to be largely left to physicians who have no special training or motivation to deal with their needs unless some needed restructuring of medical education curricula occurs.

A 1973 conference (15) specifically addressed the issue of teaching about chronic illness and aging, examining the potential for such teaching inherent in such contexts as the nursing home, the chronic disease hospital, and home care settings. Regardless of context, however, it was agreed that successful teaching programs must be able to overcome the problems of cultural/generational gap between medical students and older patients and the frequent lack of encouraging role models for students among their own medical school faculties.

Medical students are generally taught to think in terms of a single diagnosis (11). If problems of the chronically ill and aged were presented in terms of multiple diagnosis, student-physicians might perceive more challenge in working with such patients. One physician (11) has also pointed out that any area of medicine is likely to acquire an unhappy connotation if the majority of cases encountered involve chronic problems. For example, pediatrics would have a much different image "if the only experience that the medical student had was treating mentally retarded children or physically ill children." Lack of professional rewards perceived in working with geriatric patients is probably accentuated by the fact that medical students have little opportunity to see the health and strengths of older people; there are no preventive checks or periodic checkups under Medicare. Similarly, students seldom are involved in the successful return of a chronically ill patient to his own home and community and in planning for the maintenance of the patient in that setting.

It is possible that a more holistic approach to teaching about chronic illness would be effective; if students could have a positive experience in treating chronically ill children, toward whom their initial attitude is more likely to be positive, perhaps the students would then develop more positive attitudes toward the care of chronically ill adults and the elderly. And as one physician has argued (15), "if we can somehow, in a respectable fashion, impress upon him that it is indeed his responsibility as a healer—the medical student is very emotional about being a healer—that his responsibility includes the healing or the care for the chronically ill, I think we will have done a great deal. We don't do this in a regular fashion."

It is true that development of health care professionals other than physicians, within the context of an improved system of health care delivery, may go far in relieving the current unavailability of care for the chronically ill. For example, nurses, based on their daily, intensive interactions with patients, may be best able to judge when a hospitalized patient is ready for home care. And there are recent accounts of the effectiveness of physician's assistants in providing long-term care (16, 17). It is the physician, however, who retains ultimate responsibility for the patient's outcome, and other health care professionals are not likely to be anxious to assume this responsibility themselves. Generating among as many medical students as possible increased and sustained interest in chronic illness and in the comprehensive care required by such illness should become one of the most important objectives of medical education.

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The Nurse Practitioner as a Teacher Of Physical Examination Skills

Paula L. Stillman, M.D., Josephine Gibson, Daniel Levinson, M.D., Jane Ruggill, and Darrell Sabers, Ph.D.

Abstract—The service role of nurse practitioners has been widely recognized (1). However, their potential as clinical instructors of physical examination skills has not been appreciated. This article details a new first-year medical school course in physical examination in which nurse practitioners are key members of the instructional team.

The process and outcome of medical education have been the focus of critical review in recent years. One area of the curriculum which has received increasing attention is the teaching and evaluation of basic physical examination skills (2). All medical schools teach this subject, but instructional methods vary. At the inaugural meeting of the Task Force on Physical Diagnosis held at the Association of American Medical Colleges meeting in San Francisco, November 12, 1976, participants from approximately 40 American medical schools convened to discuss the teaching of physical diagnosis.* It was agreed that the teaching of physical diagnosis deserves greater emphasis than is generally evident in medical school curricula. Six critical instructional problems were identified:

1. There are too many medical students compared with the available clinical facilities.
2. There are too few patients for students to examine.
3. Recruitment of interested and energetic instructors is often difficult because this activity has few academic rewards at most medical schools.
4. Each clinician, using an individualized approach, emphasizes what he considers most interesting and relevant. This results in a lack of uniform experience for the beginning student.
5. Few objective evaluation instruments are available to assess a student's proficiency and knowledge.
6. Faculty preceptor time might be more efficiently used if this course could be effectively taught by other health-care personnel.

Dr. Stillman is coordinator, Mrs. Ruggill is a research associate, and Dr. Sabers is an educational consultant for the preparation for clinical medicine program. Dr. Levinson is associate professor of family and community medicine. All are at the University of Arizona College of Medicine, Tucson. Mrs. Gibson is the director of the Nurse Practitioner Programs and associate professor of nursing at the University of Arizona College of Nursing.

* Complete minutes of the meeting are available from the first author.

Historical Background

The problems identified at the national task force meeting also existed at the

University of Arizona College of Medicine. Basic physical examination skills were taught to the 90 first-year medical students in the fall semester of the first year in a course entitled "Preparation for Clinical Medicine." Four students were assigned to a clinician for a 14-hour preceptorship. The major goal was to teach the students to perform a screening examination on an asymptomatic adult. Students practiced newly acquired skills on classmates and on hospitalized patients when possible and appropriate. At the completion of the course students who performed inadequately were not always identified and were permitted to proceed to more advanced training even though they lacked a solid foundation in elementary techniques.

To remedy major deficiencies, the faculty of the physical examination course modified its design in 1976.

Course Structure

The new course is a highly structured, sequential, competency-based program devoted to teaching students the basic screening examination of the asymptomatic adult. Nurse practitioners function as key members of the instructional team. In the course students use a required textbook, "A Guide to Physical Examination" (3), and supplemental protocols developed by the faculty.

The primary learning objectives are clearly outlined. At the completion of the course the medical student should be able to:

1. Apply the skills of observation, palpation, percussion, and auscultation to elicit objective data describing the structure and function of the human body.
2. Use clinical instruments to obtain accurate data.
3. Describe bodily structures and functions with standard medical vocabulary.
4. Conduct a screening physical examination on an asymptomatic adult in no more than 30 minutes in a sequence efficient for the examiner and comfortable for the patient.
5. Summarize and record the findings of a physical examination.
6. Correlate normal physical findings with basic anatomy and physiology.

The clinical practices and terminology included in the textbook (3) are followed.

The course is divided into nine two-hour sessions. Each of the first seven sessions focuses on the assessment of a major organ system. The last two sessions are used for practice and evaluation. Before the students arrive for each session, there is a brief preparatory meeting with participating nurse practitioners and the course coordinators. The examination protocol for the session is reviewed with emphasis on areas which should receive special attention. Any problems with course administration are also discussed. When the students arrive, there is a short orienting lecture by a physician accompanied by a videotape demonstrating the examination for that session. The remainder of the time is spent in a small-group practice session.

The nurse practitioners supervise the medical students, observing them as they examine each other using the protocols. The nurses assist the students in developing proper basic physical examination techniques, give continuous feedback to the students on their progress, and offer remedial help when indicated. At each session two or three physicians are available to the nurse practitioners to answer questions, but the physicians do not provide primary supervision of the medical students. This permits a considerable reduction in physician time compared with the previous year's program in which 23 physicians were present at each session. The nurse practitioners work in pairs; a student nurse practitioner, who is a registered nurse, and a graduate nurse practitioner are assigned to the six medical students in each group. This requires 15 nurse practitioner teams. All the nurse practitioner students and most of the graduates have learned physical examination skills from the same physician who directs the medical student course. That physician has personally observed each of the nurse practitioners performing a physical examination and has certified their competence. The course provides a highly uniform, closely supervised educational experience for medical students.

Course Evaluation

Assessment at the conclusion of the course includes:

1. Student ability to perform the basic physical examination.
2. Student ratings of the course design and their nurse practitioner instructors.
3. Nurse practitioner ratings of the course. Because a secondary goal of the program is to provide continuing nursing education, the nurse practitioners are asked to assess improvement in their skills as a result of participation.

Results

For the final evaluation each student is required to perform a complete physical examination on a classmate observed by a nurse practitioner who evaluates the student's performance using a comprehensive objective checklist. The checklist includes items listed in the weekly protocols and items dealing with the professional interaction between physician and patient. Each student is required to complete 80 percent of the items successfully. The evaluating nurse practitioner has not previously supervised the student being examined.

In the first year of the program (1976) the preset criteria were surpassed by 80 students (92 percent of the class). The remaining students received remedial instruction and were required to repeat the examination until they met those standards. The faculty rated current students as being more skillful in physical examination techniques than previous students. Because there had been no objective evaluation of students in prior years, it is not possible to document this statistically.

Eighty-three students completed a course evaluation questionnaire. These questionnaires are routinely used by the College of Medicine to monitor courses and thus provide data for direct comparison with the previous year's course, which utilized physician preceptors. The results of the student questionnaire indicated that in 1976 students rated the course significantly more favorably than did the 1975 class in the following areas: the sequence of the course within the total first-year curriculum, both the quantity and quality of feedback received from preceptors during the practice sessions, and the balance between "watching" a physical examination being performed by the preceptor and "doing" the physical examination on their partner. Students in the 1975 class felt that they had spent too much time watching. When asked whether their instructors should continue to teach future classes, the 1976 students rated their nurse practitioners higher than the previous year's students had rated their physician instructors. The ratings of the two classes were similar in terms of student assessment of their performance of the screening physical examination. There was no area in which the 1976 course was rated lower than the previous course.

One of the anticipated outcomes of this program was to engender in future physicians a positive attitude toward nurse practitioners. At the beginning of the course 44 percent of the students stated they would be very likely to hire a nurse practitioner if they were in practice and had a large patient load. At the

completion of the course 68 percent of the students responded similarly. Because the difference in these percents is significant at the .01 level by the *t* test of proportions for dependent samples, it was tentatively concluded that medical students developed a more favorable attitude toward nurse practitioners during the course. The long-term effects cannot be assessed until these students have completed their medical training and are ready to enter practice.

As has been noted, at the conclusion of the course each nurse practitioner completed a course evaluation questionnaire. Results indicated that 96 percent of them felt that their knowledge of physical examination skills had improved, 83 percent agreed that their ability to perform a physical examination had improved, and 87 percent said that their ability to supervise a physical examination had improved as a result of participation in this course. Eighty-seven percent felt that they had the necessary knowledge to answer questions posed by the medical students during the practice sessions. This last conclusion was supported by 74 percent of the students. There are no data available with which to compare these responses, but it is obvious that the nurse practitioners responded favorably to their role as instructors.

Discussion

In 1962 Seegal (4) documented a significant lack of medical student ability in basic physical examination skills. In 15 years of observing graduates of leading medical schools, he could not find one who recalled performing a complete physical examination under faculty supervision. The primary clinical data obtained by these young physicians contained frequent, often serious errors both of omission and commission. Almost identical findings were reported recently by Wiener and Nathanson (2). Engel (5), summarizing 17 years of informal inquiry of students of more than 50 North American medical schools, "encountered few who can report being monitored in the interview and physical examination of more than one or two patients." The continuing educational neglect of the basic physical examination skills may reflect the highly specialized clinical interests of many university faculties and, as Engel suggests, an accelerating emphasis on medical technology.

A logical and appropriate response to the need for greater supervision is the use of primary care clinicians as clinical instructors. The nurse practitioner is one such clinician who, by training and practice, relies for problem-solving relatively more on data derived from interview and physical examination and less on sophisticated laboratory tests than does the university-based physician. The nurse practitioner, and other "new practitioners," have been a part of the health care delivery scene long enough to establish their competence as clinicians (6–8). Their inclusion as members of an instructional team appears to be educationally sound.

The acquisition of reliable and efficient examination skills is, of course, only one link in a chain of learning processes needed for the maturing of the student into the physician. Concepts of professionalism, correlative basic science, perceptive observation, and sound clinical reasoning are essential to give meaning to the unprocessed clinical data of the interview and physical examination. In these areas faculty members respond with genuine enthusiasm. Without meticulous attention to the details of observation, palpation, percussion, auscultation, and sequence of examination, however, all subsequent skills cannot yield valid clinical conclusions. Realistic acknowledgment of the differing characteristics and interests of nurse practitioners and the specialty-oriented medical school faculties and a joining of the two into an instructional team may restore clinical observation to its proper place as the foundation of clinical practice.

The segment of the University of Arizona curriculum that has been described emphasizes physical examination of the healthy adult. The focus in subsequent segments is on the regional specialty examinations and the identification and interpretation of pathological findings in patients. The physician faculty of the College of Medicine was recruited to serve as preceptors for the teaching of these latter skills, which can be best taught by physicians; and no difficulty was encountered in enlisting faculty participation.

For other schools wishing to institute a similar program, there are several potential problems. Students should be fully aware of the scope of the examination before forming their groups. The majority of students readily accepted working in groups of six, all examining each other under the supervision of two nurse practitioner instructors. However, some students requested to work in pairs in order to have more privacy. A few students objected to any form of peer examination. Even though the nurse practitioners were all trained by the same physician and were certified as competent in performing a basic physical examination, they were not homogeneous in knowledge or skills. Monitoring is required to ensure consistent, competent instruction.

Conclusions

Nurse practitioners as members of an instructional team can make a significant contribution to the teaching of basic physical examination skills to first-year medical students and can ensure that each student achieves a mastery level of performance. Early exposure to the role of the nurse practitioner appears to enhance students' attitudes toward them. Nurse practitioners are able to improve their skills by participating as instructors and evaluators.

This program has addressed itself to the six critical instructional problem areas previously identified. Utilization of skilled nurse practitioners to teach and evaluate physical examination skills for freshman medical students frees physician time for other endeavors. The need for locating suitable hospitalized patients for these fatiguing and sometimes uncomfortable examinations has been eliminated by having students learn and practice their beginning skills on fellow classmates. In addition, the students experience what it is like to be a patient. The course offers a highly structured and uniform learning experience to medical students in an effort to ensure that they enter their clerkships proficient and knowledgeable in basic physical examination skills.

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Physician's Orders, Use of Nursing Resources, And Subsequent Clinical Events

Robert L. Vautrain and Paul F. Griner, M.D.

Abstract – Orders written by medical residents to be carried out on newly hospitalized patients were reviewed to determine the frequency of vital signs orders. Subsequent clinical events requiring the nurse to contact the house officer were then determined by daily follow-up. No relationship was found between the frequency of initial vital signs and the probability of a subsequent vital-sign event. However, the probability of a subsequent non-vital-sign event was 3.8 times greater among patients with frequent initial vital signs than among all others. Since orders requesting the frequent determination of vital signs appear to predict clinical events other than vital-signs events, such orders may be wasteful of nursing resources. In addition, other skilled observations may be neglected. These data suggest that physicians should request nurses to use more efficient and appropriate methods of clinical observation.

The rising cost of hospital care is generally recognized as a major cause of health care inflation. Escalating hospital costs have resulted in critical analyses of the efficacy of various medical practices (1–3). For example, excess utilization of laboratory services has been shown to be a factor in the high cost of hospital care (4, 5). Less attention has been directed toward possible excessive use of other hospital resources. Nursing services, for example, comprise a major share of hospital budgets. It thus seems appropriate to examine the extent to which these services are efficiently used.

Many of the activities of the nurse are programmed through the written orders of the physician. For example, the physician customarily states both the nature (that is, temperature, pulse, blood pressure, and respiration) and frequency of vital-signs observations of patients; this represents a conscious allocation of nursing time. If it is assumed that frequent vital signs are ordered for patients who may develop vital-signs abnormalities, a clear correlation between the two should be demonstrable. Such a finding would be positive evidence of appropriate allocation of nursing resources. On the other hand, absence of a correlation would suggest misallocation of nursing resources and the need to reassess this traditional approach to patient observation.

The authors examined this thesis by determining the relationship between vital-signs orders and the frequency and nature of subsequent clinical events among patients hospitalized on the medical service of a large teaching hospital.

Mr. Vautrain is a fourth-year medical student and Dr. Griner is professor and acting chairman, Department of Medicine, University of Rochester School of Medicine and Dentistry, Rochester, New York.

Methods

The admission orders for vital signs were determined for 120 patients consecutively admitted to the general medicine floors of Strong Memorial Hospital, Rochester, New York. Such orders are written almost exclusively by the first-year medical resident assigned to the patient. A request for vital signs every four hours or more frequently was arbitrarily designated as "frequent." All clinical events occurring within the first 10 days of hospitalization were recorded. Clinical events were defined as changes in patient status brought to the attention of house officers by nurses as requiring or possibly requiring the intervention of the house officer and which were detected by nurses as the result of their direct observation of the patient including the assessment of vital signs. Clinical events were classified as vital-signs events (aberrations of temperature, pulse, respiratory rate, or blood pressure) and non-vital-signs events (for example pain, bleeding, dyspnea, nasogastric tube, endotracheal tube, catheter problems, vomiting, and unresponsiveness).

The relationship, if any, between frequent versus infrequent vital-signs orders on the one hand and subsequent vital-signs and non-vital-signs clinical events on the other was examined in the form of fourfold tables. The sensitivity and specificity of frequent vital signs for subsequent clinical events and the probability of a clinical event given the frequency of vital signs were determined from these tables (6). The significance of any apparent differences was assessed by chi-square analysis with correction for continuity (7).

Results

In general, temperature, pulse, respiration, and blood pressure were ordered as a block. Approximately two-thirds of all patients (81) had these vital signs ordered at least every four hours, 11 every four to six hours, 16 every six hours, 11 every eight hours, and one daily. For 90 of these 120 patients, the house officer had noted on the orders that he wished to be called if aberrations of vital signs occurred and/or other clinical events took place. Forty-nine percent of patients also had orders written for measurement of intake and output.

Following is a listing of the vital-signs events that occurred and the number of patients involved: fever, 13; hypertension, 4; bradycardia, 3; hypotension, 3; tachycardia, 2; and arrhythmia, 1. The following comprised the non-vital signs events: chest pain, 3; oliguria, 3; headache, 3; dyspnea, 3; shaking chill, 3; unresponsiveness, 2; bladder catheter, 2; emesis, 2; fell out of bed, 2; nasogastric tube, 2; hemoptysis, 1; rash, 1; bloody stool, 1; hematemesis, 1; hematuria, 1; paresthesia, 1; and endotracheal tube, 1. In three instances where both vital-signs and non-vital-signs events were observed, the vital-signs component was more prominent and the event was classified as a vital-signs event for the purpose of subsequent correlations with vital signs frequency.

Of the 62 patients hospitalized for at least 10 days, 17 had vital-signs events while 20 had non-vital-signs events. Only 5 patients had events of both kinds, each on different occasions. The occurrence of the two kinds of events was independent and uncorrelated.

Vital-signs frequency was not correlated with the subsequent occurrence of vital-signs events. Eleven of 17 patients with vital-signs events had frequent vital signs ordered as did 31 of 45 patients without vital-signs events. Frequent vital signs were thus neither particularly sensitive nor very specific predictors of subsequent vital-signs events (65 percent and 31 percent, respectively), and patients with infrequent vital signs were as likely to have a subsequent vital-signs event as those with frequent vital signs (30 percent and 26 percent, respectively). On the other hand, frequency of vital-signs observations appeared to correlate well with non-vital-signs events. Eighteen of 20 patients with non-vital-signs events had frequent vital signs ordered as opposed to only 24 of 42 patients who did not have such events. The sensitivity and specificity of frequent vital signs (90 percent and 43 percent, respectively) were thus greater for subsequent non-vital-signs events than for vital-signs events. Patients with frequent vital signs had a four times higher chance of having a non-vital-signs event than did those with infrequent vital signs (43 percent versus 10 percent, respectively). This association was significant at the .025 level.

Discussion

Rapidly escalating hospital costs have led investigators to attempt to ferret out areas of conventional hospital care that are not cost effective. This preliminary study continues that strategy by focusing upon the utilization of nursing resources by the physician. To show that this is an element of nursing care that deserves consideration, it is also necessary to establish that the cost of this task is significant. Informal but systematic observation of nurses carrying out vital-signs observations on the medical floors of Strong Memorial Hospital yielded an estimate of four minutes per reading including transcription time. For a 24-bed floor the measurement of vital signs on patients every four hours requires 9.6 hours of nursing time each day.

The finding that taking vital signs frequently did not predict the subsequent development of vital-signs events but that it did correlate well with subsequent non-vital-signs events suggests that the features of a patient's clinical presentation which elicit the examining physician's request for frequent vital signs are the features of a sick patient and are not limited to anticipated abnormalities of vital signs per se. The use of frequent vital signs thus seems to be a standard mechanism for ensuring frequent observation of the patient.

Since the collection of vital signs represents a time-consuming and thus costly aspect of nursing care, the physician should request frequent vital signs when appropriate but should also have a method for requesting simple, fast observation or questioning of the patient to ensure early detection of other important clinical events. Data from this study suggest that such a change in the usual request for nursing observation of patients would not only conserve a valuable resource but also permit a sharper focus upon anticipated clinical events than is implied through vital signs orders per se.

Thus, it appears that there is a need for further evaluation of the efficacy of physician-directed nursing tasks. Such evaluations should examine the extent to which alternatives to traditionally ordered but inefficient nursing tasks influence outcomes of patient care in addition to addressing issues of costs.

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The Effects of Monitoring The Use of Gentamicin in a Community Hospital

David N. Gilbert, M.D., Nancy M. Eubanks, and Joanne M. Jackson

Abstract—This report describes the effect of a combined education and monitoring program on the use of gentamicin in a community hospital. The use of gentamicin was evaluated in 82 patients prior to an education program and in 80 patients after the education program. The results indicate that the attention focused on gentamicin by the study significantly improved the valid indications for treatment from 75 percent to 87 percent ($p < .05$), increased the pretreatment use of bacteriologic cultures from 85 percent to 97 percent ($p < .05$), increased the use of alternative less toxic antibiotics from 36 percent to 75 percent ($p < .05$), and increased the frequency with which serum gentamicin concentrations were requested during therapy from 28 percent to 56 percent ($p < .001$). Thus, the data support the tenet that the ways antibiotics are employed in community hospitals can be altered.

Various national organizations and leaders in the field of infectious diseases have expressed concern over misuse of antibiotics. It was the hypothesis of the authors that it is possible to improve antimicrobial therapy by focusing the attention of the community hospital physician on one specific antibiotic rather than by controlling the distribution of the antibiotic or antibiotics in general. They studied gentamicin as a representative, very effective but potentially toxic, and expensive antibiotic. Previous studies have dealt with the general overutilization of antibiotics (1–9). Only one report of an analysis of the validity of specific indications for antibiotic use was identified (2). Rarer still are attempts to modify documented deficiencies in physicians' use of antimicrobials via education (10). There appear to have been no prospective studies of antibiotic prescribing practices in the community hospital environment.

Materials and Methods

Fisher's exact test for the comparison of two proportions was utilized for the statistical analyses that were performed.

PREEDUCATION SURVEILLANCE

A period of surveillance was necessary in order to identify deficiencies in the hospital use of gentamicin by members of the medical staff. The investigation was undertaken without notifying the 230 members of the medical staff of the spe-

This investigation was supported by Contract 223-74-3034 from the Anti-Infective Drug Division of the Food and Drug Administration.

Dr. Gilbert is associate professor of medicine at the University of Oregon Health Sciences Center and director of medical education at Providence Medical Center, Portland, Oregon. Ms. Eubanks was formerly a research associate at Providence Medical Center and currently resides in Naches, Washington. Ms. Jackson is nurse epidemiologist at Providence Medical Center.

cifics of the study. They were told only that "an antibiotic study" had been approved and that an occasional blood sample might be required from their patients.

All patients for whom gentamicin was prescribed were entered into the study regardless of the number of doses of gentamicin subsequently administered. In those instances in which the patient's attending physician did not request serum levels, the investigators collected serum for determination of peak serum concentrations (11). The peak serum gentamicin concentration was accepted as valid only in those instances in which the timing of the serum collection was known to be appropriate. All reports of serum gentamicin concentration determinations were placed in the patient's chart. The report slips indicated that the desired therapeutic range for a peak serum gentamicin concentration was four to eight μg/ml.

The appropriateness of therapy was judged by criteria established prior to the initiation of the study. In essence, the criteria required either the suspicion of, or laboratory confirmation of, an infection caused by an aerobic gram-negative bacillus. The clinical indications for the use of gentamicin were judged after it was determined whether the drug was prescribed for empiric, specific, or prophylactic use. The empiric use of gentamicin was defined as the prescription of gentamicin in those clinical circumstances where specific bacteriologic culture and sensitivity data were not available. A specific indication for gentamicin was defined as the use of the drug when bacteriologic culture and sensitivity data were available at the time gentamicin was prescribed. A prophylactic indication was defined as the use of gentamicin for a patient without active infection but considered to be running a risk of developing an infection secondary to a contemplated diagnostic or therapeutic clinical maneuver.

The criteria for appropriate pretreatment cultures were established prior to initiating the study. In general, an appropriate culture was defined as a culture of the body fluid or site suspected as the source and/or site of infection, for example, urine for suspected urinary tract infection.

EDUCATION PROGRAM

An education program was carried out in order to inform all members of the medical staff of the results of the preeducation surveillance study. Each member of the medical staff was mailed a complete summary of the results. In addition, a series of seminars involving a total of 135 physicians was held during which the study results were presented and discussed. Subsequently, a checklist for the use of gentamicin was prescribed. The checklist was sent to the nursing station from the pharmacy each time a new gentamicin prescription was received. It was intended that the checklist serve as a continuous reminder to the patient's physician as to the appropriateness of pretreatment cultures, the value of serum drug levels, and the importance of monitoring renal function. The checklist procedure continued during the posteducation study.

POSTEDUCATION SURVEILLANCE

Two months after completion of the education program all patients for whom gentamicin was prescribed were entered into the study, and the indications for the gentamicin therapy were analyzed. The criteria used to judge the appropriateness of therapy were the same as those used in the preeducation phase. If gentamicin serum levels were not ordered, the investigators obtained serum for this purpose.

One of the investigators (D.N.G.) was active as an infectious diseases consultant in the hospital throughout all phases of the study. The infectious diseases consultant was not involved in the care given any of the patients included in this study.

RENAL IMPAIRMENT

The frequency with which tests of renal function were performed was analyzed. As an arbitrary standard some assessment of kidney function was considered to be appropriate if gentamicin was given for three or more days. The patient was considered to have developed renal impairment if the serum creatinine concentration increased above 1.5 mg/100 ml to a value at least double the pregentamicin therapy creatinine concentration.

Results

Eighty-two patients were evaluated in the preeducation study during a five-and-a-half month period. One patient of every 85 admitted to the hospital received gentamicin. The 80 patients in the posteducation study were accumulated over a period of three-and-a-half months. In this period one patient of every 55 patients admitted received gentamicin. The preeducation group of 82 patients consisted of 43 males and 39 females. Only one patient was under the age of 12, which reflects the hospital's small pediatric service. In the posteducation group there were 42 males and 38 females, with only two patients being under the age of 12.

The distribution among the subspecialties of the physicians prescribing gentamicin was similar in the preeducation and posteducation study groups. The internal medicine residents and the hematologic subspecialists prescribed gentamicin more frequently than other internal medicine groups. The urologists and general surgeons used gentamicin more frequently than other surgical specialists.

PRETREATMENT CULTURES

There were 59 patients treated empirically in the preeducation study. Cultures of potentially infected body fluid were obtained prior to the initiation of gentamicin therapy in 50 of the 59 patients (85 percent). A urine culture was not obtained prior to treatment for one patient considered to have a urinary tract infection. Cultures were not obtained from five patients suspected of having intraabdominal infections at the time of surgery. Two surgical wound infections were not cultured, and one patient with suspected bacteremia did not have blood cultures obtained. The concept of appropriate pretreatment cultures was stressed during the education phase of the study. In the posteducation study appropriate cultures were obtained from 64 of 66 patients (97 percent) treated empirically prior to their receiving gentamicin. One patient with a suspected pneumonia and one patient with an intraabdominal abscess did not have appropriate cultures prior to therapy.

In the preeducation study group 32 of the 59 patients treated empirically had positive cultures for potential pathogens. *In vitro* antibiotic susceptibility studies on these 32 pathogens demonstrated that in 18 instances gentamicin was the most effective and potentially least toxic antimicrobial agent. In 14 instances sensitivity testing demonstrated the availability of equally effective but potentially less toxic antimicrobial agents. In only five of the 14 instances (36 percent) was an alternative antibiotic substituted for gentamicin. In none of the nine patients where gentamicin was continued was drug allergy a problem. In three of the nine patients *E. coli* was the pathogen isolated, and the *E. coli* was susceptible to ampicillin. In two instances an ampicillin-susceptible *Proteus mirabilis* was the pathogen. Klebsiella species susceptible to cephalothin was found in one instance.

Staph. aureus susceptible to methicillin was found in one instance. Group A streptococcus susceptible to penicillin and a variety of other antibiotics was found in one patient. Lastly, one patient had a mixed infection with Klebsiella species and *E. coli*. Both isolates were susceptible to cephalothin.

The advisability of switching to a less toxic but equally effective antibiotic on the basis of the results of *in vitro* sensitivity testing was stressed during the education program. In the posteducation study 36 patients had potential pathogens isolated from appropriate specimens submitted for culture. In 12 of these 36 patients, gentamicin appeared to be the drug of choice based upon *in vitro* susceptibility testing. In 24 of the 36 patients a less toxic, equally effective alternative agent was identified. In 18 of the 24 patients (75 percent) gentamicin was discontinued and therapy initiated with the alternative antibiotic.

THERAPEUTIC INDICATIONS

Using the criteria established before the study began, the investigators analyzed the validity of prescribing gentamicin. In six of the 82 patients in the preeducation group and in five of the 80 patients in the posteducation group there were insufficient data available to judge the appropriateness of gentamicin therapy. These patients were not included in the analysis. When the remaining 76 patients in the preeducation study group were compared with the remaining 75 patients in the posteducation study group, it was discovered that the percentage of patients with valid indications for gentamicin increased from 75 percent to 87 percent ($p < .05$).

PEAK SERUM CONCENTRATIONS

In the preeducation study there was a total of 46 valid peak gentamicin concentration determinations. In half of these patients the peak level was less than four μg/ml, a concentration which is considered subtherapeutic. There were no patients with peak gentamicin concentrations above eight μg/ml. These results confirmed the unpredictability of gentamicin peak serum concentrations. The need for determination of peak gentamicin serum concentrations to ensure therapeutic efficacy was stressed during the education sessions. There was a statistically significant increase in requests from hospital staff physicians for serum gentamicin concentration determinations from 28 percent in the preeducation study to 56 percent in the posteducation study ($p < .001$).

RENAL IMPAIRMENT

In the preeducation study 56 of the 82 patients were treated for longer than three days, and in the posteducation study 54 of the 80 patients were treated for longer than three days. In the preeducation study 28 of the 56 patients treated for longer than three days had tests of renal function performed, and in six of the 28 patients a deterioration in renal function was observed. In the posteducation study 36 of the 54 patients treated longer than three days had tests of renal function after initiation of gentamicin therapy, and in two of these 36 patients a deterioration in renal function was observed. The hospital records of all patients who developed impaired renal function were analyzed to determine the possibility of gentamicin-induced renal injury. In all eight patients the complexity of the patient's diseases and therapy made it very difficult to prove the etiologic role of gentamicin in the patient's renal impairment.

Discussion

The study reported here involved relatively few patients and was carried out over a brief period of time. It was not

the intent of the investigators to determine whether sustained long-term changes occurred in the ways gentamicin was prescribed. Rather it was their intent to attempt to modify, if even for a short period, the utilization of gentamicin via a combined education and monitoring program. The results support a positive influence of the program. No other studies to date have demonstrated a definite effect, short-term or long-term, of such educational efforts. In fact, a report of the most recent study of this type, conducted in a teaching hospital, describes a negative result (10).

The increased frequency of gentamicin usage in the posteducation survey was unexpected. Hopefully, this pattern represents physician confidence in their knowledge of correct indications and contraindications. This interpretation is supported by the increased percentage of indications judged to be valid in the posteducation study.

The experimental design does not allow the conclusion that the education program produced the beneficial changes observed. It is certainly possible that the changes observed were the result of the medical staff's becoming aware via the education program, and then by the chart checklist, that the usage of gentamicin was under investigation. A change in behavior as a result of the awareness of a research project has been termed the Hawthorne effect (12–14). The results of the studies reported here are consistent with the Hawthorne effect. However, the authors do not feel that it makes any difference whether the education program or the awareness of a study in progress produced the observed changes in physician behavior. The point is simply that the behavior did change so as to improve the physicians' usage of gentamicin.

It would have been helpful to measure the duration of the altered behavior, but this was not possible because comparative studies with experimental aminoglycosides were initiated, tobramycin was licensed for clinical use, and the composition of the medical staff changed.

The present study produced statistically significant changes in gentamicin usage in four areas:

1. Physicians appeared to have a clearer conception of appropriate indications for gentamicin therapy since the percentage of valid indications for the use of the drug increased.
2. Appropriate cultures were obtained more frequently prior to gentamicin treatment.
3. The use of alternative, less toxic antibiotics increased. The preeducation study indicated that physicians in the hospital were either not familiar with or were uncomfortable with the concept of altering empiric antibiotic therapy after specific bacteriologic culture and sensitivity results became available.
4. There was an increase in the use of peak serum gentamicin levels as a laboratory guide to the adequacy of gentamicin dosage.

Not all of the deficiencies observed during the preeducation study were influenced in any major way by the attention given gentamicin. During the preeducation study the data indicated little sensitivity on the part of the medical staff regarding the potential nephrotoxicity of gentamicin. Renal function was assessed infrequently after the initiation of gentamicin therapy. Despite emphasis on this point during the education program and by means of the checklist which was subsequently placed on all patients' charts, only a modest increase in monitoring of renal function was detected in the posteducation study patients.

The data generated by this study suggest that physicians can be motivated to improve their clinical utilization of an antimicrobial agent.

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COMMUNICATIONS

Minority and Nonminority Medical Students' Perceptions of the Medical School Environment

Henry C. Johnson, Ph.D.

Understanding how students perceive the learning environment could provide valuable information about factors that may influence performance. However, we may need to understand how the general learning environment is perceived by different groups of students (1). For example, ratings of the university climate have been found to differ for black and white students. Black students consistently perceived the university climate more negatively (2). Others have suggested that the perceptions of minority and nonminority students toward the medical school environment differ. In addition, perceptions of the attitudes of faculty members have been noted as a factor that can influence the performance of minority students (3).

The purpose of this study was to investigate differences between the perceptions of minority and nonminority medical students of selected environmental concepts. Especially, there was interest in a difference between the student groups on the faculty-related concepts.

Methods

First-, second-, and third-year minority and nonminority students in 1974 and first-year minority and nonminority students in 1975 at the Rutgers Medical School were asked to rate concepts representing the medical school environment. The responses of 40 minority and 62 nonminority medical students were analyzed.

Using a semantic differential format (4), the following concepts representing elements of the environment were rated: Rutgers Medical School (RMS), administration (ADM), instruction (INS), faculty (FAC), fall tutorial assistance (FTA), faculty review sessions (FRS), special teaching program (STP), and summer program (SUM). Each concept was rated using the same 10 bipolar adjective pairs and weighted from one for least positive to seven for most positive. It was possible, therefore, to obtain a maximum score of 70 and a minimum score of 10 for any concept.

Principal component analysis was used to examine the communality of concept factor loadings for the two groups and to determine which adjective pairs loaded on the factor that accounted for the most variation. The same adjective pairs (good-bad, fast-slow, strong-weak, active-passive, sharp-dull, interesting-boring) contributed the most variation and loaded on factor one for both student groups. The scaled score obtained by summing across these adjective pairs was subsequently used as the dependent variable in analysis of variance procedures.

Results

Similar loadings on two factors emerged from the concept ratings. The first factor accounted, respectively, for 57 percent and 61 percent of the variance for the minority and nonminority student groups. RMS, INS, ADM, and FAC were the concepts with highest loading on this first factor; thus, the factor was named "Perception of the Medical School Environment." The second factor was labeled "Perception of the Remedial Programs." FTA, FRS, STP, and SUM were the concepts which loaded on this factor.

On the concepts in the first factor minority and nonminority students significantly differed in their ratings of administration and faculty. Minority students rated administra-

Dr. Johnson is director of the Office of Research and Development in Medical Education and assistant professor of psychiatry at the college of Medicine and Dentistry of New Jersey–Rutgers Medical School, Piscataway.

tion significantly higher ($F = 4.4$, $p < .04$) than nonminority students; the means obtained were 26.30 and 23.13, respectively. Nonminority students rated faculty significantly higher ($F = 4.3$, $p < .04$) than minority students; means were 33.48 and 30.36, respectively. On the concepts in the second factor there were significant differences on the special teaching program ($F = 13.52$, $p < .001$) and summer program ($F = 40.16$, $p < .001$). Mean ratings of the special teaching program were 36.39 and 31.49, respectively, for minority and nonminority students; mean ratings of the summer program were 40.84 and 29.73, respectively.

Discussion and Implications

The two student groups differed in their perceptions of four of the eight concepts rated. Minority students tended to have more positive attitudes toward the concept of administration than nonminority students and less positive attitudes toward faculty. The latter difference indicates the need to increase the positive interaction between minority students and faculty. Not surprisingly, these results also indicate that minority students are more positive toward the remedial program than nonminority students. This higher regard for the remedial programs may be due to the interaction and personal contact the students have with the program staff members who have cultivated skills in relating the students' problems. The fact that there was no difference between the groups in their rating of fall tutorial assistance and the fact that both groups rated this concept higher than factor 1 concepts support these assumptions. That is, it appears that where nonminority students have contact with special program staff, such as through tutorial assistance, their perceptions are similar to those of minority students.

The implications of this study are that special programs may be a source of positive identification for minority and nonminority medical students. In addition, the fact that minority students have less positive perceptions of the faculty than nonminority students suggests that they may have more difficulty interacting with faculty. These perceptions may also impair the desire of minority students to seek out faculty and obtain constructive feedback important for their continued development.

Improved faculty-student interaction may do much to indicate to minority students that they are accepted and to alleviate much of the uncertainty that they feel. Such an increase in faculty-student interaction and a decrease in uncertainty could have an astounding influence on the performance of minority medical students.

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Student and House Officer Evaluation: The POMR Approach Compared with Other Methods

Raymond L. Milhous, M.D., Mark D. Aronson, M.D., David M. Tormey, M.D., and Carol P. Ostrowski

The problem-oriented medical record (POMR) has been used widely in the past few years as a method for charting and for evaluation of clinical proficiency. A number of investigators (1–6) have reported their use of this system for medical student and house officer evaluation and have supported Weed's hypothesis that the POMR can provide an objective and valid evaluation of a student's clinical skills (7).

There have been no published reports of attempts to correlate evaluations based on the POMR with standard medical student and house officer evaluations. Neither have there been reports of the utilization of a nurse reviewer for chart audit for such evaluations.

Methods

A registered nurse, using criteria based on the problem-oriented medical record, retrospectively reviewed 216 records of patients admitted to the Department of Medicine of the Medical Center Hospital of Vermont between August 1975 and March 1976. Thoroughness in completing the data base was judged by noting the presence or absence of eight parts of the history and nine items of the physical examination. The problem list was evaluated by reviewing 15 physical and laboratory parameters for inclusion either separately or as a part of other problems on the problem list. Documentation of initial plans, goals, and patient education for each problem and of consistency of follow-up of each problem was monitored by review of the initial work-up, progress notes, and discharge summary.

Cases were selected for audit if the patients were admitted directly to the general medicine service, were worked up by the interns or acting interns participating in the study, and stayed at least five days in the hospital. Readmissions (less than six months) and admissions for terminal care or disposition were excluded. The reliability of the data collected by the nurse auditor was validated by independent physician audit of 200 items, and the two data bases showed a greater than 90 percent agreement. Twelve internal medicine interns and 13 junior and senior medical students participated in the project.

Separate scores for thoroughness of completion of the data base, for the problem list, for plans, and for follow-up were compiled for each individual by averaging the percentage of items completed for each section of the POMR. These scores were compared with scores obtained by grading narrative departmental evaluations and dean's letters using a six-point scale. The dean's letters summarized the student's overall academic performance up to the fall of his senior year.

The POMR audit scores were also compared with the scores the student had achieved on the Verbal Ability, Quantitative Ability, General Information, and Science subtests of the Medical College Admission Test (MCAT). Correlations were measured using Kendall's tau (8) because of the ordinal nature of the departmental and dean's evaluation scores and the nonnormality of much of the other data.

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Dr. Milhous is professor and chairman, Department of Rehabilitation Medicine, University of Vermont College of Medicine. Dr. Aronson is assistant professor of medicine, Beth Israel Hospital, Boston, Massachusetts. Dr. Tormey is associate dean of the University of Vermont College of Medicine. Ms. Ostrowski was the nurse reviewer for this project and is currently nurse auditor, University of Vermont PROMIS Demonstration and Evaluation Project.

Results

There were no significant correlations between the scores on the POMR audits and the scores on the traditional student evaluations except that the medical students' "plans" scores correlated positively with narrative departmental evaluations ($p < .015$, tau 0.45). Plans scores for the interns correlated inversely with MCAT Science scores ($p < .01$, tau −0.52), a result which could not be explained.

The data developed by the POMR audits formed a profile of patient care on the medical service. The mean score for completion of the data base was found to be 91.6 percent; for the problem list, 84.8 percent; for initial plans, goals, and patient education, 51.5 percent; and for follow-up, 75.0 percent. Parts of the record most frequently not included were a description of the average day (included 65.7 percent of the time), plans for each problem (57.0 percent), goals (26.4 percent), and patient education (17.6 percent).

Discussion

Medical students' and interns' thoroughness in keeping problem-oriented medical records was evaluated and compared with standard forms of evaluation in this study. That the POMR evaluations did not correlate well with the standard evaluations is not surprisng, given the complexity of the medical student and house officer evaluation process. The study does suggest, however, that thoroughness in charting is probably a minor variable in overall evaluation, at least in the case of interns.

Thoroughness is a characteristic which most clinicians recognize as vital to good-quality medical care. It is not a trait that necessarily reflects intelligence but one which when applied by an intelligent clinician is likely to improve patient care. Should medical schools or house officer training programs see fit to consider this trait more carefully, meaningful evaluations could be carried out using the evaluation methods reported here.

The nurse reviewer who assisted in developing the evaluation system and carried it out needed only minimal physician supervision. She was well accepted by faculty and students on the medical unit. It was concluded from this experience that further exploration of the role of the nurse in evaluation of students and house officers is warranted.

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Primary Care Experience in an Internal Medicine Residency

Ernest Peaslee, M.D., and George A. Sarosi, M.D.

Departments of medicine are under pressure to train more primary care physicians. General medical journals have published a number of articles describing changes in training programs designed to produce more internists skilled in primary care (1–4). Similarly, the University of Minnesota's Department of Medicine has developed a new ambulatory care clinic in order to present a more attractive and realistic view of practice than was formerly available.

The authors thought that a study comparing the spectrum of patients seen in the traditional hospital-based part of the program with the patients seen in the clinic would be instructive. There is a paucity of data on just what constitutes the experience of a medical resident in his training. In a comparable report Knaus and O'Leary describe the inpatient experience in a straight medicine internship at George Washington University (5).

Program Description

The first two years of the three-year program in internal medicine at the University of Minnesota involve primary patient responsibility. Third-year residents serve as consultants in the medical subspecialties and have little exposure to primary care.

Each resident rotates through the Minneapolis Veterans Administration Hospital, the University of Minnesota Hospitals (including its divisions of the Variety Club Heart Hospital and Masonic Cancer Hospital), and either the St. Paul–Ramsey Hospital or Hennepin County Medical Center. In addition, in 1975–76 nine residents each spent four months in the new ambulatory care clinic at the Miller Division of United Hospitals, a private hospital in St. Paul.

In his first year as a resident the first author (E. P.) spent five months on the general medical wards at the Veterans Hospital, three months at University Hospitals and four months at the Hennepin County Medical Center (two months in the emergency room and two months on the male medical service). In his second year the author spent six months at the Veterans Hospital, two months at the University's Variety Club Heart Hospital and four months in the new ambulatory care clinic at United Hospitals.

Methods

The author kept careful records of his patients throughout his entire primary care experience, which dated from June 24, 1974, through June 30, 1976. Patients were categorized by age, sex, race, the particular hospital and setting of care involved, disposition, and primary and secondary diagnoses.

Results

During his 18 months of inpatient experience, the author was responsible for 687 patients. There were 604 males and 83 females, reflecting the extensive time spent at the Veterans Hospital and also on the male medical service at Hennepin County Medical Center. There were only 19 non-Caucasian patients.

One-sixth of the patients required an intensive care unit: 69 were in the coronary care unit and 45 were in the medical intensive care unit.

Twenty of the 687 inpatients died. Eighteen of them were critically or terminally ill, and their death was expected. Five patients died from cancer.

Eighty-six percent (588) of the patients were admitted from home. Eighty-one came from nursing homes, and 18 were admitted from home and discharged to a nursing home.

Dr. Peaslee is a member of the Section of Internal Medicine at the Duluth Clinic, Duluth, Minnesota. Dr. Sarosi is chief of the Department of Medicine at the Minneapolis Veterans Administration Hospital; he is also professor of medicine and vice-chairman of the Department of Medicine, University of Minnesota.

TABLE 1

Demographic Data and List of Major Diagnoses of Patients Seen by a Medical Resident During 24 Months* of Primary Patient Care, 1974–1976

Data and Diagnoses	No. of Patients	
	18 Months of Inpatient Medicine	4 Months of Outpatient Medicine
General characteristics		
Number of patients	687	180
Male	604	52
Female	83	128
Non-Caucasian	19	12
Age		
Less than 30	40	41
Over 80	18	15
Number of deaths	20	0
Primary diagnoses by subspecialty		
Cardiovascular	206	45
Gastroenterology	112	15
Oncology	79	7
Pulmonary	49	8
Infectious disease	45	21
Alcohol withdrawal, drug abuse	45	0
Hematology	41	5
Rheumatology	30	20
Nephrology	22	0
Endocrinology	21	16
Neurology	12	11
Psychosomatic illness	10	18
Peripheral vascular disease	6	1
Dermatology	4	1
Miscellaneous	5	12
Most frequent primary diagnoses		
Atherosclerotic heart disease	88	14
Alcohol withdrawal	37	0
Chronic obstructive lung disease	31	4
Lung cancer	31	1
Hypertension	31	22
Valvular heart disease	30	6
Peptic ulcer disease	20	3
Alcoholic liver disease	18	0
Pancreatitis	18	1
Pneumonia	17	0
Chronic renal failure	17	0
Diabetes mellitus	15	8
Anxiety or depression	10	17
Degenerative joint disease	4	12

* Patients seen during two months of emergency room rotation are not included in the analysis.

Nearly one-third of the inpatients had a primary cardiovascular diagnosis. Gastrointestinal disease was the second most prevalent diagnosis (16.3 percent) and oncology third with 11.5 percent. Pulmonary disease, hematology, infectious disease, and drug abuse, including alcohol withdrawal, were about equally represented with between 40 and 50 patients each.

In contrast to the inpatients, the patients seen in the medicine clinic were predominantly female (71 percent). Also proportionately more older and younger patients were seen in the clinic (Table 1).

The subspecialty categorization of the outpatients resembles that of the inpatients in several respects and contrasts with it in others. Cardiovascular disease was by far the most common in both groups. Problems with infectious disease, rheumatology, and endocrinology, however, were seen two or three times more frequently in outpatients.

Discussion

The large number of patients (687) the author managed is noteworthy. Residents may tend to assume that private practice is less rigorous. In this regard the report of Burnum, a practicing general internist, is sobering (6). In an 11-week period in his practice he admitted 161 patients to the hospital, had 901 office visits, and made 1,394 hospital visits. In a representative workday he performed three annual examinations, evaluated one new patient, saw 12 returning patients, and visited 20 hospital patients, including two admitted that day. He estimated his patient load to be in the 85th percentile of practicing internists.

The author encountered a broad spectrum of disease, although the commonly occurring diseases in the fields of cardiology, gastroenterology, and oncology dominated the case load. Based on the number of patients seen and the spectrum of diseases managed, no changes seem warranted in the training which the author and his peers received in inpatient care except to provide a better balance between male and female patients.

The newly developed ambulatory care clinic supplemented well the traditional inpatient experience available in this residency program.

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Teaching Medical Students About Observer Variation

Lorrin M. Koran, M.D., Pierre M. Hahn, Andre A. Varma, M.D., and Leonard White, Ph.D.

To develop fully their diagnostic skills, medical students must recognize the limited reliability of the observations on which diagnoses are based. Moreover, with professional standards review organizations empowered to establish norms for reviewing the quality of medical care (P.L. 92-603), the medical profession and its regulators need to appreciate the observer variation inherent in clinical data and judgments and in the review processes themselves (1–5). In order to sensitize second-year medical students to observer variation, a two-and-a-half-hour laboratory was introduced into the seven-week, full-time program of study of the psychobiology system taught by the faculty of the Department of Psychiatry and Behavioral Sciences at the

When this study was done, Dr. Koran was associate professor of psychiatry, State University of New York at Stony Brook School of Medicine. He is now acting associate professor of psychiatry, Stanford Medical Center, Stanford, California. Mr. Hahn is research assistant professor of psychiatry; Dr. Varma is associate professor of community medicine; and Dr. White is research assistant professor of psychiatry; all at SUNY at Stony Brook School of Medicine.

State University of New York at Stony Brook School of Medicine. Adler independently proposed a similar laboratory but presented no data (6). In this paper the authors report data and experiences that may be useful to other instructors.

Method

Thirty-six second-year medical students viewed a color, sound film presenting a manometer column of mercury falling 15 times, with synchronous Korotkoff blood pressure sounds. The students were told that this film presented the systolic and diastolic blood pressures of 15 patients and were asked to record the pressures to the nearest millimeter of mercury on a standard data form. The manometer is calibrated in steps of 2 mm. of mercury with major divisions every 10 mm. "Diastolic pressure" was defined as the point at which Korotkoff sounds disappeared. In fact, the film ("Blood Pressure Readings," M-1580, National Audiovisual Center, Atlanta, Georgia) shows six blood pressure readings repeated in random order and three unrepeated readings. Students were seated from 4.3 to 9.8 meters from the screen in a semidarkened room in five rows of six to eight students. There was clearly audible, undistorted sound in the back row. The screen image size was 1.2 by 1.6 meters. The film was stopped after the first blood pressure reading (the "practice" reading) to make sure that all students understood the directions.

After the film the students worked for an hour on problems involving regression toward the mean, sensitivity, specificity, and decision analysis, while the instructors analyzed the blood pressure data. The results were then presented and discussed along with the answers to the written problems.

Results

Table 1 shows the mean, minimum, maximum, variance, and standard deviation of students' readings of systolic blood pressure for each trial (the interobserver variation). Although the range for one systolic pressure (No. 13) was 40 mm. of Hg, ranges of 6 to 26 mm. were the rule, and the exceptionally large range probably represents an instance of inattention. From the mean standard deviation the average 95 percent confidence limits (±1.96 times the mean standard deviation) for the students' observations can be calculated. On the average, 95 percent of students' observations fell with ±5.7 mm. of the group mean.

TABLE 1
Degree of Variation Readings of Systolic Blood Pressures (mm of Hg) by Second-Year Medical Students at SUNY Stony Brook

Trial No.	No. of Students	Mean	Minimum	Maximum	Sample Variance†	Sample Standard Deviation‡
P*	34	119.5	116	122	1.59	1.26
1	36	157.1	152	166	6.00	2.45
2	36	115.8	112	118	2.40	1.55
3	36	136.2	130	156	11.09	3.33
4	36	149.5	148	158	7.78	2.79
5	36	155.8	140	160	11.70	3.42
6	36	107.9	104	110	3.76	1.94
7	36	119.7	115	122	2.34	1.53
8	36	114.9	112	118	1.88	1.37
9	36	167.4	160	171	7.62	2.76
10	36	108.4	103	116	5.11	2.26
11	36	145.0	140	156	8.18	2.86
12	35	145.6	137	156	14.21	3.77
13	36	136.4	107	147	32.72	5.72
14	36	167.6	155	171	11.36	3.37

* "Practice" blood pressure.

† Average variance = 8.52.

‡ Because the average variance gives an unbiased estimate of the variability of the sample of measurements whereas the average of the standard deviations does not, the mean standard deviation (2.92) is calculated by taking the square root of the average variance.

For diastolic blood pressure readings, the largest range was only 16 mm. of Hg (No. 1). On the average, the sample variances were smaller than those for the systolic readings, indicating a smaller variability. From the mean standard deviation of the diastolic readings (2.33 mm.) it can be concluded that, on the average, 95 percent of students' observations fell within ±4.6 mm. of the group mean.

The variances of the differences between individual students' observations of the repeated systolic and diastolic blood pressures (the intraobserver variation) were also calculated. The mean intraobserver standard deviations (3.7 mm. systolic and 2.5 mm. diastolic) agree well with that found by Dixon and Johnston (2.7 mm.). They had 13 fourth-year students take repeat readings of their partners' blood pressures (7). From the two mean standard deviations it can be concluded that, on the average, 95 percent of students read the second of the paired blood pressures within ±7.2 mm. of Hg of their first reading for systolic pressures and within ±4.8 mm. Hg for diastolic pressures. Like physicians in clinical studies (8), the students showed terminal digit preferences. The terminal digits "8" and "0" were markedly overrepresented, whereas the terminal digits "1" and "3" were markedly underrepresented.

Discussion

Because of time limitations, results were presented in the discussion period for only two pairs of systolic and diastolic readings. The data were used to illustrate the magnitude of interobserver and intraobserver variation for this task and to open discussion of digit preferences in blood pressure readings, sources of variation in blood pressure data, and the ubiquity of observer variation in clinical observations and interpretations.

Multiple sources of observer variation were explored: differences in visual or auditory acuity or in reaction time, lapses of attention, the "bouncing" quality of the mercury column's descent, and seating location. In fact, seating location was not an important variable since the mean readings of students in rows one and two were usually within ±1.0 to 1.5 mm. of those in rows four and five, and the differences were usually not statistically or clinically significant. Additional sources of observer variation in clinical measurement of blood pressure were also mentioned: failure to calibrate the sphygmomanometer periodically, tilting the mercury column away from its calibrated angle, the precision and clarity of manometer scale markings, the precision to which the blood pressure is read, cuff length and width, arm position, and rate of cuff inflation and deflation (8). These sources of variation add to variations induced by changes in the patient's physiological state. Intraobserver variation was noted to be of the same order of magnitude as interobserver variation, whereas in many studies it is smaller. Finally, studies of observer variation in other clinical tasks were briefly mentioned (3).

The ranges for students' observations of the 15 blood pressures were similar to that observed among several physician observers (15 mm. of Hg) in an epidemiological study of hypertension (9). This suggests that the blood pressure film provides a task approximately as difficult as actually measuring blood pressures.

Although the students in the present study were presumably exposed to issues of measurement error and unreliability in college science courses, they had not considered these issues with regard to clinical data. When confronted with the data generated in this laboratory exercise, they experienced a brief reluctance to accept the implied uncertainty. Once this initial reluctance passed, however, a spirited discussion followed which, the authors believe, marked a greater tolerance for ambiguity and a greater understanding of uncertainties confronting the practicing physician. Perhaps the apparent success of this short laboratory will encourage others to explore methods of sensitizing students to issues of observer variation. More reliable clinical methods, data, and judgments are likely to result.

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The Geographic Distribution of Dermatologists And Residency Programs

David L. Ramsay, M.D., Melvin Krasner, Vincent J. O'Sullivan, Jr., and Peyton E. Weary, M.D.

Many factors are thought to influence a physician's choice of practice location; among them are professional factors such as demand for medical services, access to hospitals, and presence of other specialists and support services. Climate, recreational facilities, quality of local schools, and other nonprofessional considerations are also important. One notable influence that has been the subject of several investigations dealing with physicians in general is an individual's prior exposure to an area during childhood or during medical school, internship, or residency training.

Weiskotten and co-workers (1) reported that of the graduates of American medical schools in 1950 who had residency training, 63 percent located their practice in the state of their residency training, 48 percent in the state of internship, 42 percent in the state of medical school attendance, and 53 percent in the state of residence before entering medical school. Similarly, Mason (2) in a study of 1960 graduates of medical school reported that 43 percent of those surveyed were practicing in the state in which their medical school was located and 52 percent in the state in which they resided during their final year of graduate education.

Method and Results

In order to determine whether a similar relationship exists specifically in dermatology, information on the backgrounds of about 3,000 dermatologists certified by the American Board of Dermatology and listed in the Directory of Medical Specialists (3) was cross-tabulated by computer during 1976.

Among the four variables under study—state in which birth, medical education, internship, and residency occurred—the strongest influence on location was residency training. Forty-five percent of dermatologists in the sample were located in the state in which they had received residency training, a proportion generally consistent with the findings for physicians in general described earlier. A somewhat weaker relationship was found between present location and place of internship, with only 42 percent remaining in the same state. Not surprisingly, the proportion of dermatologists located in the same state as their medical schooling was only 37 percent, and an even weaker relationship (32 percent) was found for place of birth.

Since the behavior of recent graduates is the crucial element in considering the effectiveness of alternative policy options, dermatologists who graduated from medical school between 1960 and 1969 were examined separately. Similar to the findings for all dermatologists, residency training was the most important factor influencing physician location, with 45 percent of the dermatologists in the subsample being located in the same state as their specialty training. Among the recent medical school graduates the effect of the other three variables was somewhat weaker than that found for all dermatologists: 39 percent were located in the state of internship, 35 percent in the state of medical school, and 32 percent in the state of birth.

Similar analyses were conducted using the nine census divisions rather than states as geographic units. As expected, this resulted in a somewhat stronger relationship. Fifty-seven percent of dermatologists who completed medical school between 1960 and 1969 were located in the same geographic division as their residency training, 51 percent in the division of internship, 47 percent in the division of medical school, and 45 percent in the division of birth. Again residency training had the strongest influence, ranging between 71 percent in the Pacific Division and 41 percent in the West North Central Division.

As further evidence of the influence of training location on the geographical distribution of dermatologists, the number of residency programs and residency positions per state and the corresponding dermatologist-to-population ratios are presented in the table. A positive correlation of .46 exists between the supply of dermatologists relative to population and the number of training positions in a state.

TABLE 1

Distribution of States, by Dermatology Training Capacity and Dermatologist-to-Population Ratio

Dermatology Training Capacity*	Average No. of Dermatologists per 100,000 Population†	No. of States
Number of residency programs		
0	1.34	16
1	1.47	17
2	1.60	9
3	1.82	3
4 or more	1.98	5
Number of residency positions		
0	1.68‡	16
1–19	1.48	23
20–39	1.83	6
40 or more	2.21	5

* Excludes military programs.

† Excludes dermatology residents.

‡ Includes New Jersey with 159 dermatologists, the majority of whom are located in the New York metropolitan area. If New Jersey is excluded, the ratio drops to 1.44.

Discussion

A rudimentary step in obtaining a more even distribution of physician specialists is assembling and disseminating appropriate information regarding distribution. To this end, the American Academy of Dermatology has established a placement bureau and has distributed to all training programs a wall-sized map depicting the distribution of dermatologists relative to population across the United States.

The research reported earlier suggests another avenue for providing a more even distribution in the country. The data appear to indicate a significant relationship between the location of residency training and physician distribution, which suggests that modifying the location of residency positions may sub-

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Dr. Ramsay is assistant professor of dermatology at New York University School of Medicine and is principal investigator of the American Academy of Dermatology Manpower Study. Mr. Krasner is a medical economist and coordinator of the study, and Mr. O'Sullivan served as a research assistant. Dr. Weary is chairman of the Department of Dermatology at the University of Virginia School of Medicine and is a principal investigator of the study.

stantially alleviate distribution problems; however, caution is necessary in interpreting these findings, particularly if viewed as a basis for policy-making.

Both the strong relationship between place of residency and place of practice for individual dermatologists and the positive correlation between residency positions and dermatologist-to-population ratios among states are subject to alternative explanations. Individuals may select the site of their training on the basis of preferred practice location; therefore, changing the site of residency may not have the desired effect on eventual practice location. The heavy concentration of dermatologists in a state may be as much a cause of the many residency positions as their effect. Residency programs may be likely to develop in places where there is a rich pool of practitioners from which an excellent and diverse clinical faculty and attending staff can be drawn. Nevertheless, it is likely that a trainee's acclimatization to an area and the establishment of early professional relationships there play an important part in the practice location decision.

Many of the medical schools without a residency program in dermatology appear to be located in relatively underserved areas, and it would be appropriate to consider establishing residency programs at some of these institutions. The fact that nine schools do not have a department or division of dermatology at all hinders the proper training of primary care physicians in the fundamentals of dermatology, a field which accounts for over five percent of all ambulatory visits (4). This omission may also discourage students from selecting dermatology as a career, thus perhaps contributing to a relative scarcity of dermatologists in the area.

Another approach to alleviating local shortages, especially in areas where establishing residency programs would be undesirable for any number of reasons, would be to introduce one-month work experiences or externships in such areas as part of existing training programs. Under such a system residents would get virtually all of their training as they currently do, but they would be encouraged or required to have a professional experience in an underserved community as part of their graduate medical education. Such an approach may achieve some of the benefits of distributing residency training without the possible attendant inefficiencies.

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Using Nonpsychiatric Patients To Teach Medical Students About Psychiatry

Herta A. Guttman, M.D., and Joel Paris, M.D.

For most medical students psychiatry is a brief interlude in a curriculum which emphasizes a concept of illness based on molecular and cellular biology. In the short time available to them, teachers of psychiatry can emphasize at least one of two objectives:

1. Teaching psychiatry as a medical specialty. This could involve an emphasis on phenomenology or dynamics or both; the approach implies that psychiatry is as relevant and scientifically sound as surgery and should be taken just as seriously. The goal is to produce physicians who can recognize and manage depression and schizophrenia.

2. Teaching the psychosocial aspects of medical illness. In this view psychiatry would be forgotten by students if they see it as a specialty entirely separate in theory and in practice from the rest of medicine. Because many teachers of medicine and surgery are primarily oriented toward teaching about the physical aspects of illness and tend to downplay psychosocial factors in its etiology and treatment, the psychiatry rotation may be the student's only exposure to this important aspect of medicine. In this case the goal is to produce physicians capable of providing truly comprehensive care (1, 2).

These two objectives should not be mutually exclusive. Whereas psychiatry can and must be taught as a discipline comprising a particular body of knowledge, it also has much to contribute to understanding the psychosocial and psychosomatic aspects of any physical illness (3).

Program Description

The psychiatry rotation at the Jewish General Hospital in Montreal gives successive groups of McGill University medical students a single exposure of eight weeks in the third year. Since 1972 it has attempted to fulfill both the objectives described here. To expose students to clinical psychiatry, there are outpatient and emergency experiences for all, with additional options of inpatient work or child psychiatry. To teach psychosocial aspects of medicine within a psychiatric consultation service is difficult because the student group is too large to observe or help carry out consultations, and rounds where the students have never seen the patient prove to be boring. Moreover, consultation is often requested only on grossly disturbed patients; therefore, the tendency to ignore more usual psychological problems is reinforced.

For this reason ordinary medical patients and their families are used for teaching. Patients are selected by nurses as well as doctors because resistance to interviewing can be higher among physicians, whose education does not put as much emphasis on the human responses of patients as does nursing education.

Contact is made with interested head nurses on medical, surgical, and gynecological floors who are willing to provide patients or families. Patients are selected on the basis of their ability and willingness to talk; only the severely ill are systematically excluded. The interview is designed to sensitize students to the reciprocal interaction among the patient, the family, and medical personnel. It is usually done by the psychiatrist, with a question period open to students.

On the whole, charting – both nursing and medical – gives grossly inadequate information about psychosocial or behavioral factors in disease, and one of the points made in teaching is that this reflects an important medical blind spot. Comparison of the patient information revealed in a half hour interview with the usual remarks in the chart, such as

Dr. Guttman is director of family therapy training programs and of the psychiatric liaison service of the Department of Psychiatry, Jewish General Hospital, Montreal, Quebec. Dr. Paris is coordinator of undergraduate education in the Department of Psychiatry there.

"patient admits to one pack of cigarettes and two beers a day" or "parents and siblings alive and well," is illuminating.

Interviewing a Patient

The following example illustrates an interview with a patient. A school teacher in her early 30s suffered from regional ileitis. She was a constant problem for the staff because of controlling, watchful behavior. When she was sent for an intravenous pyelogram, she insisted on knowing the incidence of complications of the injection and commented critically on the technician's ability to do the procedure properly. Several times she picked up medication errors by nurses as she always counted and checked out each dose before taking it. This patient demonstrated both the personality type associated with her psychophysiological disorder (4) and the management problem with this personality type as described by Kahana and Bibring (5).

Interviewing the Family

Observing and interpreting the complexities of family interaction are difficult; therefore, the psychiatry instructor begins by presenting a videotaped rather than a live family interview. After they have watched one tape in this way, the students see several live interviews with families of patients on medicine, surgery, gynecology, and obstetrics services. Later, the students participate in a simulation in which several of them role-play family members while another plays the role of the interviewer. Previous experience (6) with this modality has been corroborated; it is useful for internalizing concepts of family dynamics and for permitting the students to practice interviewing techniques. Probably the simulated family is one of the most popular of the teaching sessions.

Families were usually interviewed with the patient. However, sometimes the patient was physically unable to participate. The following is an example of such an interview:

The father, mother, and 16-year-old sister of an 18-year-old athlete who was quadriplegic following a trampoline accident demonstrated the reactions of many such families. They discussed whether or not to tell the boy about the hopelessness of his ultimate prognosis. During the interview they fluctuated between denial and acceptance of his situation. They demonstrated the importance of the various kinds of support they had been receiving—from the extended family, members of families of other such patients, their church, and their community. They also demonstrated how people can initially use doctors as scapegoats for their frustration, anger, and shock at such a tragedy and how medical personnel must be aware of this process in order not to become defensive or angry in the face of such blaming.

Discussion

Exposure to individual and family interviewing seems to be serving a useful purpose for these medical students. It promotes an awareness that the psychological, the physical, and the familial are interrelated aspects of people's responses to illness.

What has been most striking is that the students' initial skepticism concerning the probable importance of life events in precipitating some physical illnesses (7) quickly turns into acceptance as a succession of interviews demonstrates the remarkable frequency with which patients and their families have recently had to cope with such events as moving, getting a new job, being under greater pressure at a job, losing a parent or a close friend, or having an older child leave home. Moreover, these young medical students regularly express a wish to conduct interviews themselves, although they are not expected to do so. When they are invited to interview a patient, they prove themselves equal to the task despite their relatively brief experience.

The student response to this experience has been consistently positive, as measured both by informal end-of-rotation feedback meetings and by formal rating sheets filled out by 12 successive groups of students over a three-year period. What is not clear is the long-term impact of the experience (1). Some students who were enthusiastic about this aspect of their psychiatric rotation have been observed as interns and residents describing cases in the usual mechanistic fashion of a modern physician. However, as consultant psychiatrists the authors have found it fairly easy to resurrect their empathic understanding of patients, whereas it is difficult to do the same with those who have never been exposed to the experience described here.

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Resource Identification: A Use Of Psychiatric Residents' Evaluation of Faculty

William H. Sledge, M.D.

The last decade has witnessed an expanding interest in student evaluation of faculty. Recently psychiatric educators have been interested in specifying the goals of residency and evaluating how these goals are met (1). In this time of psychiatric education funding changes, the move to a four-year program, and an increasing emphasis on accountability, it seems appropriate to examine the use of residents' evaluation of faculty to identify and describe academic resources. The thesis of this report is that such an undertaking can well serve the psychiatric residency educational task.

The literature addressing precisely what student evaluations measure about teaching and learning is filled with controversy. Rippey (2) notes "... student ratings of teachers are multi-dimensional and interact with the environmental character of the school" and "... the question is not to accept or reject. The question is how to make use of [student evaluations]."

Dr. Sledge is assistant professor of psychiatry, Yale University School of Medicine, New Haven, Connecticut.

Resource Identification

In any academic faculty various members will have different talents, skills, and knowledge which may be more appropriate to one situation than another. Furthermore, in psychiatric residency education, teaching abilities are intimately tied to personal qualities of the teachers (3, 4). This is especially true in psychotherapy supervision, where the relationship between the supervisor and supervisee is often an object of scrutiny as is the relationship between the resident and patient. As teachers vary in their strengths, so residents vary in their educational needs and their ability to respond usefully to different faculty personalities. The educational task is further complicated by the fact that psychiatric residents (more so than residents in other medical specialties) go through a developmental process that entails changes in professional skills and attitudes as well as, at times, in personality. This developmental process (3–5) may manifest itself in varying abilities and/or blocks in the residents' learning. For example, if part of the process involves doubts

about professional competence, the resident may be especially vulnerable to developing a defensive, inflexible stance in relationship to a teacher who may be either unresponsive or inappropriately responsive to the resident's professional self-esteem, with the result that the resident's sense of doubt and incompetence is exacerbated. Thus, the process of matching faculty resources with resident needs can become problematical.

An Example

By systematically collecting resident ratings, the program director can become aware of which faculty members are valued by resident subgroups, such as first-year residents, advanced residents, or troubled residents. An example of such a situation from the author's experience of coordinating resident evaluation of faculty involved several senior supervisors within the department who generally had reputations as wise clinicians and excellent teachers. Yet it was noted that their average supervisor rating was not so high as one might expect. When the ratings were grouped into first-year versus advanced residents, there was a dichotomization of the ratings in some cases. First-year residents frequently had difficulties in the form of complaints about lack of collaborative involvement and feelings of battered self-esteem with these supervisors while advanced residents tended to rate the experience quite helpful. When other supervisor ratings were examined, the reverse phenomenon was found; that is, some supervisors did much better with first-year residents but not so well with advanced residents, who complained that the supervisor was too directive or had too many preconceptions.

This function of resource identification is to be differentiated from a process that attempts to identify "good" and "bad" teachers either for personnel actions or for a resident "consumer guide." While in some situations it may be important to identify especially effective and/or especially ineffective teachers, resource identification asks and attempts to answer the question of what are the effective match-ups between faculty and residents.

Problems

There are, of course, problems with this purpose. There is the validity and reliability issues of student ratings (most researchers seem to agree that student ratings are reliable but there is great debate over the validity issue, with the majority tending to favor the view that students' ratings of faculty are valid indicators of faculty effectiveness [2, 6, 7]). There is also the problem of designing a meaningful format with useful questions. Precisely what will be asked must be determined by the educational goals and values of the department and the purpose(s) of the polling. However, a mixture of specific, behaviorally related and global, impressionistic questions is helpful in learning why and how a particular teacher may be valued by his students.

Once the goals of the evaluation have been formulated and the data collected, other problems remain. One potential problem is the availability of the results of the evaluation. The resident group may favor widespread availability of the results, and some faculty may resist publication. Another problem is the tactful use of the information; some faculty may not take well to the notion that they cannot do everything equally well. There is also the problem of whether or not evaluation should be anonymous. There are no easy, general solutions to these and other problems. Each case must be resolved individually according to its merits and within the context of the history and values of the training setting. The training director must find a way to balance the needs of the department against the needs of various groups (faculty and residents) and individuals.

Conclusion

Systematic ratings of the faculty by residents in a psychiatric training program can be useful in identifying academic resources because residents are in an unique position to provide a measure of who in the faculty has special skills that may otherwise go unnoticed. The training director, as the coordinator of resources and needs, must define how the evaluation may be employed to discover educational resources and must utilize the results of the evaluation in a meaningful fashion. Furthermore, the program director must decide to what extent resident responses are valid and to what extent the solutions suggested are in the service of avoiding learning problems or furthering professional growth.

Although psychiatric residency training has been the focus of this report, it may be possible that the use of student ratings in other settings can also serve the function of resource identification.

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Teaching Psychiatry to Medical House Staff: Report of a Weekly Conference

Stephen B. Shanfield, M.D.

Most psychiatric education of the primary physician is directed toward the teaching of medical students or the continuing education of practicing physicians (1–5). Neglected is psychiatric teaching of hospital house staff members in training to be primary care physicians. This report deals with a weekly, hour-long seminar held from July 1974 to June 1976 for medical residents in a county hospital. This program, supported by the chief of medicine, was well attended by the medical house staff rotating through the hospital for two-month periods.

Goals and Rationale

The goals were to assist the house staff member in gaining facility in psychiatric diagnosis, in understanding how psychiatric difficulties are part of medical problems, in learning the use of psychotropic medications, in being able to provide support and continuity of care, and in developing skill in communicating with a psychiatrist and knowing when to refer a patient to him. It was hoped that as technical medical psychiatric issues were mastered, the more subtle and complicated psychosocial issues and dynamics would be discussed, including the understanding of the emotional responses to patients that interfered with appropriate care.

The initial focus was on psychiatric assessment and management because many medical patients have significant psychiatric problems which are often not diagnosed and not treated or inadequately treated (6, 7). Few of these patients need or would want to be referred to a psychiatrist and are best treated by a knowledgeable primary care physician.

Dr. Shanfield is assistant professor in the Department of Psychiatry of the University of Arizona College of Medicine and chief of Outpatient Psychiatric Services at the Arizona Health Sciences Center, Tucson.

Content

The emphasis was on the most common problems that the residents encountered. The topics were outlined at the beginning of the rotation. There were three sessions on the diagnosis and medical management of depression; one session on chronic psychosis and exacerbations, with an overview of the phenothiazines; one session on the assessment and management of the patient with chronic pain; one session on the alcoholic patient; and at least one session devoted to a discussion of one of the residents' "worst cases," a proven method for reducing anxiety in the treating physician (8). Also covered was the sociopath discussed in the context of the prisoner patient, staff relationships and how they affect patient care, the dying patient, and disability assessment.

The residents' own patients were interviewed each week by the author and later by the residents, who kept a particular goal in mind. Examples of the goals were: What is the diagnosis? What are the problems of living? What feelings does the patient evoke? The use of their patients enabled them to participate actively in their own learning (9). Some general readings were recommended.

Observations and Outcome

Those most interested in the conference were the interns, who were closest to the patients and wanted to improve their treatment skills, and the second-year residents, who wanted to improve their deficits in psychiatric management before leaving the residency. No one was able to apply adequately his medical school knowledge of psychiatric diagnosis and management.

Initially, but with decreasing frequency, the house staff had no cases to discuss. The author used the time to teach the management of patients with common diagnoses and the use of medications as well as common frustrations. Only patients with the most severe psychiatric symptoms were presented by the residents for group discussion. These problems were used to illustrate the less severe and more common symptomatology present in their other patients. Over time, a broad range of patients were discussed, the residents became able to diagnose psychiatric problems with ease, and their use of psychotropic medications grew to an increasingly sophisticated level. Initially, the drugs were often not used when indicated and frequently when used were given at too low or too high a dose. Phenothiazines for chemical restraint began to be given instead of sedative hypnotics. The latter had been used particularly in the geriatric group. The prescription of tricyclic antidepressants increased markedly following the introduction of this seminar.

The house staff members were encouraged to discuss among themselves the frustrations they experienced with patients. All individual statements of difficulty were generalized, and the elements common to all were emphasized. These efforts were seen as supportive and increased participants' willingness to share problems. Their openness in discussing these issues was surprising.

During the "worst-case" seminar those patients with whom the residents felt most frustrated and helpless were interviewed. Many of these patients were or had been in treatment with a psychiatrist or in a psychiatric facility. Many currently not in psychiatric treatment had refused to return to such treatment. Often these patients had serious medical problems as well as severe psychiatric symptomalogic states, particularly chronic depression and anxiety. They were frequent users of the emergency room, and many were abusers of multiple drugs. They were often bounced about from clinic to clinic and were regarded as being unpleasant. The house staff became aware of how a patient's feelings of hopelessness and helplessness were contagious and paralyzed therapeutic involvement, thereby causing in the resident a helpless rage with an attendent guilt and withdrawal from the patient. Over time the residents learned to manage these feelings better, and this in turn produced more efficient and helpful care. The high level of skill and the dedication in the management of these patients became very impressive.

Dying patients were also interviewed. Recognition of therapeutic limits was helpful in the management of such patients.

Conflicts about disability recommendations were discussed; these were a source of continuing difficulty for the resident. He often felt pressured into making a formal statement about the patient's inability to work despite the fact that he had minimal guidelines or experience on which to base this statement.

While no formal evaluation of the program was undertaken, there were systematic inquiries made of the residents as to the growth of their psychiatric skills. These changes in behavior were corroborated by the medical staff. The house staff members reported that as a result of the seminar there was a decrease in diagnostic procedures, including surgery, and that they were better able to talk to their patients. They stated that their interviewing had improved as a result of seeing and doing interviews in front of colleagues and that they felt they knew when to refer patients to a psychiatrist. All of the goals of the weekly conference were met.

Discussion

A weekly hour-long psychiatric conference for house staff members is seen as valuable and is recommended as a part of the education of all primary care physicians. The lack of competence in psychiatric issues at the primary care level is in part due to the absence of such programs. Attendance at the conferences was mandatory for all medical house staff in contrast with continuing education programs in psychiatry which reach only a selected portion of the medical community. Psychiatric education during house staff years is essential to the training of the primary care physician.

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EDITORIAL

Why Bother with Informed Consent?

Based on the title of this editorial, one might conclude that the concept of providing medically informed consent is either optional or new. From the very onset, let me point out that both implications are false. Morally and legally, the requirement for and the provision of informed consent have existed to some degree for many years.

Prior to 1960, the physician basically felt bound only to inform the patient that a procedure or procedures were being performed and, hence, obtained the consent based upon that rather simple exchange; the patient was simply made aware that a procedure was being done. However, in 1960, this rather simplistic approach changed drastically as a result of *Nathanson v. Kline*. It was from this case that the medical profession became aware of the need to provide much more information to patients; this resulted in the creation of the so-called "collateral risk doctrine." Simply stated, the decision said that not just a physician but also the patient must possess basic knowledge about proposed procedures to make an assessment as to the risk involved. Indeed, the patient must be "informed" if he or she, along with a physician, is to be capable of rationally deciding for or against surgery based upon risk.

Following this decision of *Nathanson v. Kline*, there were numerous law suits brought forth which attempted to define how much must be told patients by doctors, but obviously none has yet accomplished this objective. The battle rages on and the question is unsettled.

Certainly much of the recent and current activity in this area is embodied in that general movement afoot in this country known as consumerism and specifically in that movement's concern with the "right to know." In the medical profession, it is expressed in the requirement for voluntary informed consent-giving on the part of the patient. Of course, it is expected that an enlightened public will keenly concern itself with disclosure issues, sunshine laws, and so forth. And such interest and activity have only been heightened by the recent revelation of past political concealments that occurred in our capital. If for no other reason than these, we as a profession must "bother" with informed consent.

In the years immediately following the *Nathan v. Kline* decision, it appeared that possibly the "standard of practice" doctrine might settle the quantitative question of how much the patient needed to be told by the doctor. The standard of practice doctrine as it applied to informed consent in essence meant that the doctor was required only to disclose to the patient those informational items that were ordinarily and usually provided in a general geographic/jurisdictional area. However, as a legal concept applicable to informed consent, significant legal challenges were presented. In 1972 the cases of *Cobbs v. Grant* in California and *Canterbury v. Spence* in Washington, D. C., eliminated the standards of practice concept as an answer to the issue of information quantity. These two decisions beyond question solidly affirmed the patient's right to self-determination regarding collateral risk in those two jurisdictions. Based on these two cases, therefore, it now appears that the court will hold doctors bound to "reasonable disclosure."

As a medical educator and an operating surgeon, I think I now know what is expected by our judicial system; I simply do not know how to accomplish it. I cannot determine what constitutes reasonable disclosure, and quite frankly the courts have not helped. By its simplest interpretation, to be informed means to be knowledgeable. However, as we know, knowledge is relative and never absolute, not for the doctor and least of all for the layman on medical issues. None of us knows everything about anything. Hence, the question of disclosure to the patients boils down to how much or to what degree. The courts will not or most likely cannot tell us how much disclosure is adequate. And even if they could, the likelihood for inconsistency among courts is a foregone conclusion. Where are we then? Very simply, we are at the mercy of juries, judges, and arbitrators.

But as dismal as my outlook may be, I do nonetheless believe there is a faint flicker of light at the tunnel's end. I believe we can reduce our risk greatly by increasing our knowledge and understanding of the issues. For example, simply knowing some of the situations in which informed consent is either difficult or impossible to obtain is essential. It behooves us to completely understand state laws on mental competency and age limitations. The latter is of particular importance to those who perform abortions and/or provide contraceptive services to minors. Certainly our affinity for misadventure is reduced if we are knowledgeable of particular areas of past difficulties, for example, the question of witnesses, supplemental documentation, risk versus benefit explanation.

Clearly the issue of informed consent is an unsettled one; however, we must nonetheless continue the travail; we must bother with informed consent.

HENRY W. FOSTER, JR., M.D., *member, Editorial Board.*

BOOK REVIEW

Comparative National Policies on Health Care. M. I. ROEMER. New York: Marcel Dekker, 1977. 252 pp. Cloth, $16.75

In an immediate sense this book is the outgrowth of a teaching project on international health sponsored by the Association of American Medical Colleges. However, Milton Roemer has studied the subject matter of this book for more than a quarter century, while serving as a health consultant in several dozen nations. In that sense the book is the outgrowth of a major portion of a leading scholar's professional life. Professor Roemer is uniquely qualified to prepare a comparative study of health care systems. As such this volume helps to fill a large gap in the literature, which has traditionally placed little emphasis on international comparisons of the structure and performance of health systems.

Two frameworks for classifying the information relevant to this topic are used to keep the book within manageable limits. First, broad categories of health system components are specified. These seven aspects of health systems are described in separate chapters: "Economic Support for Health Services," health manpower (separate chapters for physician manpower and other health personnel), "Health Facilities," "Delivery of Medical Care," "Delivery of Preventive Services," "Health Care Regulation," and "Health Service Administration and Planning." In addition to these chapters, the book includes an introductory chapter and a final chapter, "Some National Health System Panoramas." This concluding chapter utilizes the second classification framework as a basis for a more detailed discussion of representative national health systems. Five predominant forms of health organization and examples of each are surveyed in the chapter: a free enterprise system—the United States; a welfare state system—Norway; a transitional system—Peru; an underdeveloped country system—Ghana; and a socialist system—the Soviet Union.

The first chapter discusses the health service components and the orientations of the health systems described above. The next chapter, "Economic Support for Health Services," explores alternative financing mechanisms to pay for health services. All nations use one or more of the following financing methods: personal payments, charity, industry contributions, voluntary insurance, social insurance, and general tax revenues. The relative importance of each payment method in various nations is then compared. In most countries, rising shares of national wealth are being devoted to health purposes, and increasingly they are derived from social insurance and general tax revenues.

Health manpower is the subject of the next two chapters. In the chapter on physician manpower, the history of the physician is described as are the issues involving distribution, specialization, and the roles of medical schools, medical societies, and medical ethics. The chapter which follows considers traditional (nonscientific) healers, nurses, dental personnel, several categories of auxiliary personnel—for example, pharmacists, midwives and others, and "doctor substitutes." The latter are not the same as physician's assistants in the United States; instead, they essentially have independence as primary health workers. Their role is emerging as an important one, particularly in poor, rural societies. In China following the 1965 Cultural Revolution a short training program was developed to teach basic and elementary curative and preventive services to the "barefoot doctors." The program has been very successful and has been endorsed by the World Health Organization for other underdeveloped nations.

The history, sponsorship, types, and functions of hospitals are discussed, and regional health centers and other specialized care facilities are mentioned in the chapter on "Health Facilities." Hospitals in the United States, Belgium, Nigeria, Brazil, and Poland are compared. It is interesting to note that nearly one-third of hospital beds in the United States and Belgium are for mental patients (32.1 and 33.0 percent, respectively) while only 4.3 percent of the beds in underdeveloped Nigeria are for such patients. Other comparisons help to explain the broad variations in hospital sponsorship, staffing, functions, and activities that may be observed worldwide.

Health delivery is surveyed in chapters on medical services and preventive services. It is noted that "fee-for-service" is so entrenched in the free enterprise delivery systems that it is used even where payment has been collectivized through third-party arrangements. Moreover, welfare state systems usually retain the private practitioner as the principal source of primary care delivery. The socialist countries, on the other hand, generally provide primary services through state-operated health centers; socialist health systems also emphasize primary care services for children. Dr. Roemer observes that specialized services for the aged and chronically ill are rarely available in transitional or underdeveloped nations, although those services are common in free enterprise, welfare, and socialist health systems. The author asserts that dental services are generally inadequate even in the most affluent societies. Family planning, child health, and environmental and communicable disease control programs are also considered in this section of the book.

Chapters 8 and 9 compare health regulation, planning, and administration. Regulatory controls covering health professionals, health facilities, and drugs are discussed. Students in health administration and public administration will find these chapters of particular interest.

While this reviewer found *Comparative National Policies on Health Care* to be a useful book, it is not without defects. Most of the material is merely descriptive and not analytical in nature. For example, the author does not evaluate the impact of different health systems on the efficiency or effectiveness of health delivery within those settings. The reader is told how health services are organized in different countries, but he does not easily get a sense for what works well and what does not. The book is part of a relatively new series, "Political Science and Public Administration." Yet sources are not annotated, and there is not a single footnote. Additional readings are listed at the close of each chapter. There are several views about footnoting; my own preference is for explicit identification of the sources for crucial or specific information or data.

More surprising is the virtual absence of any figures, tables, charts, or graphs. The book contains but one figure and one table. A comparative study such as this lends itself to the comparison of a variety of information. While comparisons do occur throughout the text, they essentially are absent in tabular or graphical form. This is bothersome. Still, *Comparative National Policies on Health Care* is a useful book.

RICHARD C. MCKIBBIN, PH.D., *assistant professor of economics and assistant professor of health care administration, Wichita State University, Wichita, Kansas.*

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LETTERS TO THE EDITOR

The Educational Specialist

As an educational specialist, I was personally disappointed to see that one of the results of the AAMC Faculty Development Survey (*Preliminary Report of the Faculty Development Survey, Special Report*, Division of Faculty Development, Association of American Medical Colleges, March 1977, unpublished and for limited distribution) showed that in terms of influence and assistance on instructional issues and problems, educational specialists ranked second from the bottom of a list of eight possible "influentials." The following question was asked: "How often do you seek assistance/advice on instructional issues and problems from the sources listed below?" The responses were: faculty—colleagues within my department (93 percent), current students (83 percent), faculty—colleagues outside my department (74 percent), former students (73 percent), the literature (73 percent), department chairperson(s) (61 percent), educational specialist(s) (28 percent), and assistant or associate dean for educational or academic affairs (12 percent).

Admittedly, the question asked on the survey did not deal with the fact that such persons are not readily accessible in a majority of medical schools. However, since my business is that of assisting in the solution of instructional problems, I took a second look at current models for faculty development and speculated that the educational specialist might increase his effectiveness by broadening the scope of his target.

How can the real "influentials," faculty colleagues within one's own department, and both current and former students be mobilized for the improvement of instruction? I believe many schools are within a stone's throw of having a feasible system in action. Let me illustrate using our own institution as an example. At the University of Connecticut Health Center, students are used consistently as members of teaching committees and as evaluators of instruction. Some students are substantially involved in the curriculum during their four years at the Health Center. We even have the title of "educational officer" for some of these students. Others assume more ad hoc roles. Occasionally these students become involved in educational discussions with members of the Department of Research in Health Education, and occasionally they attend faculty development seminars. After graduation the Health Center employs some of its graduates for junior faculty positions. In some cases, these junior faculty provide unusually valuable insights since they have completed the entire curriculum and have a perspective of the curriculum and its effects on students which is unique. Furthermore, the bushy-tailed junior faculty member can sometimes have an influence on the curriculum far beyond his credentials simply as a matter of default since more senior compatriots are quite willing to allow misguided youth to spend itself on such amenities.

In view of the findings of the AAMC survey, it might be productive to formalize the procedure described above. What would be the effects of deliberately involving both top achieving and activist students in faculty development activities with the intention of recycling them as faculty members following a variety of externships? The student involvement should not be burdensome to them. Some of the better students would find such a program only slightly more time-consuming than their current level of participation as academic officers and possibly less time-consuming than the activities of the official class activist. Such a program would provide education officers and other interested students with insights into the research on education, and consequently they might become more intelligent consumers of their own educations, more thoughtful critics of their programs, and more capable apprentices for filling the ranks of tomorrow's medical faculties. By being exposed to educational thinking at an earlier age, homegrown faculty members might form crucial links among educational specialists and the departments.

ROBERT M. RIPPEY, PH.D., *professor, Department of Research in Health Education, University of Connecticut Health Center*

Health Care Model

Dr. Smilkstein's article, "A Model for Teaching Comprehensive Health Care," in the September issue provides educators in primary care with an excellent structural concept for teaching comprehensive health care. I would suggest, however, that in order to make this model functional in residency training programs, specific criteria for delivering comprehensive care and specific behavioral objectives to be achieved by residents need to be developed.

In order to meet the goals of (*a*) functioning as a physician in an ambulatory/hospital setting providing continuous and comprehensive health care to an identifiable cohort of patients, (*b*) providing each patient and family with quality, comprehensive care to include concerns regarding their physical, emotional, sociological, and rehabilitative health, and (*c*) functioning as a coordinator of the health care system, specific criteria need to be developed for the content of a complete data base by age groups, the urgency in acquiring all of the identified data in a specific time period, methodology of health hazard identification, the frequency of health maintenance visits based on identified health risks, methodology in dealing with compliance problems, an efficient recall system, appropriate utilization of consultants, and appropriate utilization of other health professionals.

Only after these criteria are developed can meaningful behavioral objectives be designed to be used to evaluate the progress of residents as well as the outcome of the effect of comprehensive care in the community of patients served.

MERRILL N. WERBLUN, M.D., *director, Family Medicine Residency Program, University of Washington School of Medicine.*

The 'Mini-God' Syndrome

Arrogance is a rather common failing among physicians, especially, it seems, in large hospitals and central clinics. Outwardly, it is expressed in various behavioral patterns, such as belittlement of the patient or the nursing staff or in self-exaltation over colleagues. In time, haughtiness and arrogance may become major characteristics of all interpersonal relations, including private affairs.

It is possible to understand this phenomenon by analyzing the motive that brings us to study medicine and then to persist in its practice. The claims that it is a respectable, interesting, profitable profession and one that enables us to help our fellowman are all correct; but on a more profound level, the motive behind them all is the self-satisfaction they provide and their contribution to the strengthening of the ego. Many of our colleagues will hesitate to admit that, with all our joy at the recovery of a patient, our satisfaction comes mainly from the knowledge that we made that recovery possible.

Within the physician-patient relationship, the patient's standing is characterized by dependence and faith. It is difficult at times to conceive the degree of dependence, as, for instance, in the case of the patient who allows the surgeon to take him into the operating room, to anesthetize him, and to do with him as he thinks suitable. The knowledge that the physician will do his best and that the well-being of his patient is his primary concern justifies the trust of the patient in him. There is no doubt that such a relationship is ideal for medical treatment, for the physician is free to decide and act purely upon his best professional judgment. This relationship should not be influenced by the patient's social or economic status; in the sick bed, all are equal.

The great power which the physician possesses and which is frequently reinforced tends to create a feeling of superiority. In everyday life we may encounter similar phenomena in various craftsmen whose services we require. But the physician, who deals with the life and health of his fellow creatures, builds a self-image of a "Mini-God." Lack of adequate self-criticism and a healthy sense of proportion enables the inevitable development of arrogance—perhaps no more than an unpleasant side effect—but there is also danger of the development of disrespect for human life and health.

This phenomenon can be uprooted quite easily on condition that every one of us is conscious of it, is persistent in his self-restraint, and remembers to treat every fellow human being with due honor. Thus, we shall improve ourselves and gain respect as human beings and not just as good professionals. In no way do I preach self-devaluation; rather, let us build our image and reputations as physicians upon real, scientific, and medical achievements only.

A. STERNBERG, M.D., *Beilinson Medical Center, Petah Tiqva, Israel.*

In Appreciation

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Review of Medical School Administrative Staff Salaries 1976–1977

This survey examines salaries of administrators at 94 U.S. medical schools. The study provides information concerning functional effort, title, degree, number of people directly supervised and title of immediate supervisor. It also restricts the scope to those individuals who provide at least 20 percent of their time to management activities and where such persons function ultimately under the aegis of the medical school dean.

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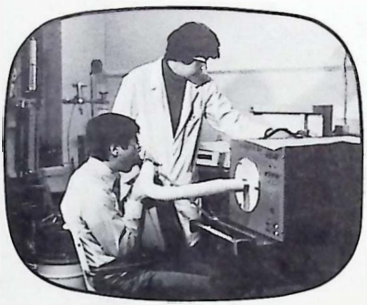
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