

## ORIGINAL ARTICLES

# Contributions of General Internal Medicine Teaching Units

## A National Survey

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**OBJECTIVE:** To identify and describe general internal medicine teaching units and their educational activities.

**DESIGN:** A cross-sectional mailed survey of heads of general internal medicine teaching units affiliated with U.S. internal medicine training programs who responded between December 1996 and December 1997.

**MEASUREMENTS AND MAIN RESULTS:** Responses were received from 249 (61%) of 409 eligible programs. Responding and nonresponding programs were similar in terms of university affiliation, geographic region, and size of residency program. Fifty percent of faculty received no funding from teaching units, 37% received full-time (50% or more time), and 13% received part-time (under 50% time) funding from units. Only 23% of faculty were primarily located at universities or medical schools. The majority of faculty were classified as clinicians (15% or less time spent in teaching) or clinician-educators (more than 15% time spent in teaching), and few were clinician-researchers (30% or more time spent in research). Thirty-six percent of faculty were internal medicine subspecialists. All units were involved in training internal medicine residents and medical students, and 21% trained fellows of various types. Half of the units had teaching clinics located in underserved areas, and one fourth had teaching clinics serving more than 50% managed care patients. Heads of teaching units reported that 54% of recent graduating residents chose careers in general internal medicine.

**CONCLUSIONS:** General internal medicine teaching units surveyed contributed substantial faculty effort, much of it un-

funded and located off-campus, to training medical students, residents, and fellows. A majority of their graduating residents chose generalist careers.

**KEY WORDS:** medical education; medical students; residents; internal medicine.

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The promotion of generalism and enhanced education of physicians in the primary care disciplines has been an important workforce goal for the United States.<sup>1-3</sup> Exposure to the generalist disciplines begins during the undergraduate phase of the medical school curriculum and continues into graduate training for physicians who select generalist careers. The discipline of internal medicine trains 22% of all residents, graduating nearly 7,000 trainees eligible for certification by the American Board of Internal Medicine each year.<sup>4</sup> Between 1980 and 1985, 56% of these graduates entered careers in general or primary care internal medicine,<sup>5</sup> the largest source of generalist physicians in the United States.

The educational infrastructure required to train such a large number of medical students and graduate physicians in general internal medicine is considerable, enlisting faculty organized into general internal medicine teaching units associated with residency programs in internal medicine. Information describing the structure and activities of these units is limited because they operate within the larger context of departments of internal medicine and are difficult to track by existing data monitoring. Previous studies of general internal medicine divisions focused only on those in medical school or university medical centers, missing the educational contributions of internists who were working in community settings.<sup>6,7</sup> To identify and describe general internal medicine teaching units, we conducted a national survey of heads of such units, including those in both university and community settings.

## METHODS

The study is based on the results of a cross-sectional mailed survey of heads of general internal medicine teaching units affiliated with U.S. internal medicine resi-

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dency programs. A "teaching unit" was defined as the department, division, section, or other equivalent group of internists centered on general internal medicine teaching activities of the residency program. Most of these units are divisions of general internal medicine, although we used a broader definition in order to capture teaching activities outside formal divisions. Faculty were defined as individuals who assume teaching responsibilities within the unit whether or not they are funded or have academic appointments.

The questionnaire consisted of 34 items, including multiple choice, short answer, and scaled responses. Topics included descriptions of unit and faculty demographics and professional responsibilities; teaching activities for medical students, residents, and fellows; involvement in specific parts of the curriculum; and career choices of residents and fellows. Heads of teaching units were asked to classify faculty by their major professional responsibilities and identities. According to our classification, "clinicians" spend 15% or less of their time in teaching activities and the rest of their time in patient care activities, "clinician-educators" spend more than 15% of their time teaching, and "clinician-researchers" spend 30% or more of their time in research activities. Faculty members who did not fit any of these classifications were classified as "other." Funding levels were defined as "full-time" if the faculty member received 50% or more full time equivalent (FTE) funding from the unit, "part-time" if less than 50% FTE, and "volunteer" if not funded at all by the unit. The purpose of these designations was to capture teaching efforts that are not funded by the teaching unit itself. Location of faculty was defined as the place where a faculty member has a primary office or practice.

A working group made up of members of the Society of General Internal Medicine (SGIM) developed the questionnaire with input from more than 50 members of the Association of Program Directors of Internal Medicine (APDIM). The questionnaire was pilot tested by 8 heads of general internal medicine teaching units that differed by region, size, and affiliation. Since no directory of teaching units exists, the surveys were sent to all 409 directors of internal medicine residency training programs in the United States listed in the American Medical Association *Graduate Medical Education Directory, 1996-1997*.<sup>8</sup> Program directors were instructed to forward the survey to the leader of the teaching unit as defined above. Surveys were sent in December 1996, and followed by reminder letters, telephone calls and e-mail messages, and additional surveys if needed. This process was repeated for nonrespondents again in September 1997 to enhance response rates. Surveys were accepted until December 1, 1997.

Questionnaire responses were manually entered and coded. Response frequencies were evaluated for completeness, and descriptive statistics such as means, ranges, standard deviations, and percentages were calculated using the Statistical Analysis System software version 6.12 (SAS Institute, Cary, NC). Differences among groups were

determined by  $\chi^2$  comparisons. Two questions required respondents to rate the degree to which members of their unit are involved in specific training activities on a Likert scale from 1 (contributes to activity but has a minor role) to 5 (primarily responsible for activity). After assessing frequencies, we collapsed the scaled responses into categories describing the level of faculty involvement as none, minor (1-2), moderate (3), or major (4-5).

## RESULTS

### Response Rate

A total of 409 residency training programs were sent the questionnaire, and 249 (61%) completed and returned it. The survey captured 218 (59%) of 372 categorical internal medicine programs (59 of these also included primary care tracks that were not listed separately in the *AMA Graduate Medical Education Directory, 1996-1997*), and 66 (63%) of 104 primary care programs that were listed separately in the directory. Some respondents were involved with both categorical and primary care programs.

Characteristics of responding and nonresponding programs were compared using data from the *AMA Graduate Medical Education Directory, 1996-1997*.<sup>8</sup> Comparisons between respondents and nonrespondents indicated no statistically significant differences in terms of university or medical school affiliation, geographic region, and size of residency program. We had no way to determine if respondents and nonrespondents differed in other ways.

### Faculty Demographics and Professional Activities

Half of the physicians identified as faculty members in responding units were not funded by the unit but rather were volunteers. Most of the funded faculty were supported at 50% or more time in the unit and are categorized as full-time in this analysis. Most faculty (66%) worked in locations away from a university or medical school. Thirty-six percent of faculty were internal medicine subspecialists. Other demographic characteristics of faculty are listed in Table 1.

Fifty-one percent of funded and 13% of volunteer faculty were classified as clinician-educators ( $P = .001$ ) (Table 2). The remaining funded faculty were either clinicians (28%) or clinician-researchers (13%), and the remaining volunteer faculty were predominantly clinicians (75%). A higher proportion of funded faculty have academic appointments compared with volunteer faculty (62% vs 46%,  $P = .001$ ). In both groups, the most common appointment is assistant professor, followed by instructor and associate professor. Only 8% of funded and 4% of volunteer faculty have full professor appointments. We did not assess what proportion of the appointments had prefix designations (e.g., clinical).

Table 1. Faculty Demographics

Characteristic	Physician Faculty (N = 16,418), n (%)
Physician funding by teaching unit	
Full-time (50% or more funded time)	6,052 (37)
Part-time (<50% funded time)	2,167 (13)
Volunteer (no funded time in unit)	8,162 (50)
Other	37 (0.2)
Number of physicians in teaching unit	
<25	1,142 (7)
25–75	4,182 (25)
>75	11,094 (68)
Primary location of physicians	
University/medical school	3,814 (23)
Non-university/medical school setting*	9,332 (57)
Other†	1,521 (9)
Missing/no answer	1,751 (11)
Specialty	
General internal medicine	8,190 (50)
Subspecialty of internal medicine	5,956 (36)
Other	323 (2)
Missing/no answer	1,949 (12)
Gender	
Male	9,281 (57)
Female	3,000 (18)
Missing/no answer	4,137 (25)
Race/ethnic origin	
African American	392 (2)
American Indian or Alaskan Native	25 (0.2)
Asian/Pacific Islander	797 (5)
Hispanic	252 (2)
Middle Eastern	372 (2)
White (non Hispanic)	7,414 (45)
Other	241 (2)
Missing/no answer	6,925 (42)

\*Includes VA, military, and community-based public, private, and HMO settings.

†Other settings include health centers, nursing homes, and hospices.

## Faculty Teaching

Faculty in nearly all responding units taught medical students (98%) and internal medicine residents (99%). Most units (88%) were affiliated with categorical internal medicine programs. A subset of units were affiliated with primary care track internal medicine programs, either with (27%) or without (24%) separate listings in the *AMA Graduate Medical Education Directory, 1996–1997*<sup>8</sup> (i.e., a categorical residency program that designates some or all of its residents as being in a primary care program). Seventy-two units (29%) also trained residents in combined programs (e.g., medicine/pediatrics) as well as other types of programs (e.g., preliminary or transitional, family medicine).

Fellowship training occurred in 21% of units. General internal medicine fellowships were most common (16% of units), but geriatrics, clinical epidemiology, informatics, health services research, women's health, health policy, ethics, and several others were also indicated by a small proportion of respondents.

Ninety-eight percent of units had faculty who taught in outpatient continuity clinics required for internal medicine residents, and 22% had faculty who taught in elective clinics (Table 3). Faculty also taught in medical student outpatient clinic clerkships during both the third and fourth years. Student and resident clinics were most often located in community hospitals, private offices, and universities or medical schools, although respondents described a wide variety of teaching settings.

## Teaching in Underserved and Managed Care Settings

Nearly half of the units supported faculty and trainees in underserved clinic settings, defined as Health Professional Shortage Areas, National Health Service Corps Sites, Indian Health Service Sites, state or local sites designated by state governments, or clinics with more than 50% Medicaid or uninsured patients. Forty-three percent of units reported that they have faculty members with

Table 2. Faculty Professional Activities

Activity	Full-time/Part-time (n = 8,219), n (%)	Volunteer/Other (n = 8,199), n (%)	Difference*, P
Predominant faculty activities <sup>†</sup>			.001
Clinician	2,325 (28)	6,140 (75)	
Clinician-educator	4,174 (51)	1,043 (13)	
Clinician-researcher	1,090 (13)	39 (0.5)	
Other	166 (2)	185 (2)	
Missing/no answer	464 (6)	792 (10)	
Faculty specialties			.001
General internal medicine (no fellowship training)	4,349 (53)	3,168 (39)	
General internal medicine (fellowship training) <sup>‡</sup>	501 (6)	172 (2)	
Internal medicine subspecialty certification <sup>§</sup>	2,803 (34)	3,153 (38)	
Non-internal medicine physicians	241 (3)	82 (1)	
Missing/no answer	325 (4)	1,624 (20)	
Faculty with academic appointments			.001
Professor	680 (8)	343 (4)	
Associate professor	975 (12)	589 (7)	
Assistant professor	2,335 (28)	1,780 (22)	
Instructor	1,030 (13)	725 (9)	
Other	120 (2)	317 (4)	
No appointments/missing/no answer	3,079 (38)	4,445 (54)	

\*Difference determined by  $\chi^2$  test.

<sup>†</sup> "Clinicians" spend most of their time in patient care and 15% or less time teaching; "clinician-educators" spend a large amount of their time in patient care and more than 15% time teaching; "clinician-researchers" spend 30% or more of their time in research.

<sup>‡</sup> Trained in fellowships such as general internal medicine, clinical epidemiology, informatics, ethics, etc.

<sup>§</sup> Trained in fellowships leading to certification in internal medicine subspecialty.

clinics located in underserved areas; 49% have resident clinics and 37% have medical student clinics located in underserved areas. Far fewer units reported clinic locations serving more than 50% managed care patients (25% faculty, 27% resident, and 19% medical student clinics).

Forty-one percent of units indicated that residents participate and 25% that students participate in volunteer clinical activities. These were described as working in homeless shelters, free clinics, drug and alcohol rehabilitation centers, other community clinics, home medical services, HIV/AIDS clinics, screening clinics, migrant farm worker clinics, adolescent clinics, health fairs, women's shelters, needle-exchange programs, preventive services, and church-sponsored clinics, among others.

## Involvement in Curricula

Respondents rated the degree to which faculty members of their unit were involved in training activities for preclinical medical students. Teaching patient interviewing and physical examination skills ranked as the most common teaching activity (56% of units indicated major involvement). Others activities are described in Table 4.

Similarly, respondents rated faculty involvement in teaching activities for internal medicine residents other than the outpatient continuity clinics described above. The highest-ranked activities, indicating a major responsibility for the activity, were inpatient wards, ambulatory blocks, general internal medicine consultations, preven-

tive medicine, critical appraisal of medical literature, and geriatrics (Table 5).

## Career Outcomes

Respondents were asked to determine the number of graduates in the previous 3 years from their primary care residency programs, categorical and other types of residency programs, and general internal medicine and related fellowships. Of these graduates, an estimated 76% of 1,436 of primary care residents, 51% of 9,241 categorical residents, and 79% of 238 fellows chose a career in general internal medicine. Of all graduates, an estimated 18% of primary care residents, 10% of categorical residents, and 8% of fellows currently practiced in medically underserved communities as previously defined.

## DISCUSSION

The results of our survey of general internal medicine teaching units indicate that faculty were predominantly clinicians and clinician-educators, half of them unfunded by the teaching unit, and were primarily located away from university or medical school settings. Faculty contributed to the training programs of medical students and residents by assuming responsibility for teaching in outpatient continuity clinics as well as many other activities in the curriculum.

Table 3. Faculty Involvement in Student and Resident Clinics

Clinic Involvement	Units (N = 249)		
	Resident Continuity Clinics, n (%)	Student Clerkships, n (%)	
		Third Year	Fourth Year
Required outpatient clinics			
Faculty teach	244 (98)	170 (68)	117 (47)
Faculty do not teach	3 (1)	37 (15)	73 (29)
Missing/no answer	2 (1)	42 (17)	59 (24)
Elective outpatient clinics			
Faculty teach	54 (22)	89 (36)	175 (70)
Faculty do not teach	188 (76)	43 (17)	34 (14)
Missing/no answer	7 (3)	117 (47)	40 (16)
Location of clinics*			
Nonhospital based			
Private office	90 (36)		119 (48)
Country or public health center	37 (15)		33 (13)
Other†	50 (20)		41 (17)
Hospital based			
Community hospital	126 (51)		130 (52)
University/medical school	53 (21)		59 (24)
Veterans Administration	47 (19)		43 (17)
Public or county hospital	32 (13)		33 (13)
HMO	12 (5)		10 (4)
Military	11 (4)		6 (2)
Other	8 (3)		12 (5)
Missing	2 (1)		15 (6)

\* Respondents may check more than one category; percentages total more than 100.

† Includes community health clinics, ambulatory care centers, urgent care centers, student health and other free-standing clinics, satellite clinics, home visit and outreach programs, among others.

Most faculty identified in this study were clinicians and clinician-educators, who differ primarily by the proportion of time allocated to direct patient care and educational activities.<sup>9</sup> Clinician-educators, those spending more than 15% of time in teaching, were more likely to be funded by the unit than were clinicians who spend less time in teaching. This study did not quantitate the actual hours spent teaching. In recent years, the numbers of full-time funded internal medicine faculty have increased only 0.5% per year,<sup>10</sup> necessitating continued dependence on volunteer faculty. Estimates of the real costs of medical education may be significantly underestimated if these efforts are not accounted for. Because teaching is not a

revenue-producing activity for volunteer faculty, they may feel pressured to limit their teaching time. Changing market forces and the demands of managed care may restrict this time even further in the future.

Not only were many teaching faculty unfunded by the teaching unit, but many were also academically unrecognized. Although more than half of faculty had academic appointments, these were usually at the assistant professor level or lower. Funded faculty were more likely to have academic appointments than volunteer faculty. The survey did not include questions to determine the appropriateness of these appointments or clarify issues related to prefixed appointments or tenure.

Table 4. Involvement in Medical Student Preclinical Curriculum

Teaching Activity	Units (N = 249), n (%)			
	Major (4-5)*	Moderate (3)	Minor (1-2)	None/No answer
Patient interview/physical examination	139 (56)	65 (26)	22 (9)	23 (9)
Ethics/humanities	77 (31)	70 (28)	72 (29)	30 (12)
Critical appraisal of medical literature	77 (31)	64 (26)	80 (32)	28 (11)
Preventive medicine	68 (27)	60 (24)	86 (35)	35 (14)
Clinical epidemiology/public health	50 (20)	55 (22)	107 (43)	37 (15)
Biostatistics/informatics	38 (15)	65 (26)	111 (45)	35 (14)
Health policy	34 (14)	58 (23)	123 (49)	34 (14)

\* Unit involvement in a teaching activity is scored on a scale from 1 to 5 where 1 = contributes to activity but has a minor role and 5 = primarily responsible for activity.

Table 5. Involvement in Resident Curriculum

Teaching Activity	Units (N = 249), n (%)			
	Major (4–5)*	Moderate (3)	Minor (1–2)	None/No Answer
Inpatient wards	226 (91)	19 (8)	1 (0.4)	3 (1)
Ambulatory blocks	208 (84)	26 (10)	10 (4)	5 (2)
General internal medicine consultations	180 (72)	38 (15)	27 (11)	4 (2)
Preventive medicine	168 (68)	57 (23)	19 (8)	5 (2)
Critical appraisal of medical literature	168 (68)	47 (19)	24 (10)	10 (4)
Geriatrics	166 (67)	46 (18)	27 (11)	10 (4)
Ethics/humanities	150 (60)	57 (23)	33 (13)	9 (4)
HIV/AIDS	134 (54)	56 (23)	50 (2)	9 (4)
Women's health	135 (54)	67 (27)	37 (15)	10 (4)
Behavioral medicine/communication	125 (50)	76 (31)	38 (15)	10 (4)
Biostatistics/informatics	110 (44)	64 (26)	64 (26)	11 (4)
Substance abuse	100 (40)	76 (31)	61 (25)	12 (5)
Intensive care unit	119 (48)	33 (13)	81 (33)	16 (6)
Clinical epidemiology/public health	103 (41)	63 (25)	72 (29)	11 (4)
Health policy	74 (30)	77 (31)	85 (34)	13 (5)
Emergency service/acute care	66 (27)	64 (26)	109 (44)	10 (4)

\*Unit involvement in a teaching activity is scored on a scale from 1 to 5 where 1 = contributes to activity but has a minor role and 5 = primarily responsible for activity.

Most faculty were not located at university or medical school settings. Similarly, student and resident clinics were often located away from universities and medical schools including clinics for underserved and managed care populations. The survey found that faculty supported training experiences and patient populations from a wide range of community sources. As such, faculty serve as valuable resources in preparing trainee physicians to meet the health care needs of a complex society. Funding and professional recognition for faculty located in these settings may be needed to continue and expand community-based clinical experiences for trainees.<sup>11</sup>

Respondents indicated that a majority of graduating residents, including slightly more than half of categorical residents, chose general internal medicine careers during the previous 3 years. These results are nearly identical to those determined in 1987 by a different survey method.<sup>5</sup> Although the percentage of primary care residents choosing general internal medicine exceeded the percentage of those from categorical programs, most general internists were still products of categorical programs. Although primary care programs clearly enhance the production of general internists and need continued support, categorical programs also require support in their efforts to produce general internists.

This study has some important advantages over previous work in that it broadens the view of general medical education to include the contributions of generalist faculty located away from university or medical school medical centers.<sup>6,7</sup> It is a national survey with an acceptable response rate. It is also the first study of its kind to provide information important to understanding the resources being used for general medicine education.

This study also has several limitations. First, we contacted internal medicine residency program directors in

order to survey heads of teaching units because there is no official directory of these units or even general internal medicine divisions. Some programs may be affiliated with more than one unit and other programs with none, so the exact number of teaching units may be somewhat larger or smaller than the number of programs. Respondents may have been more likely than nonrespondents to have functional units that were more involved in teaching. Also, nonrespondents may have differed from respondents in several variables that were not measured. However, our findings are most likely generalizable because our sample was large and nonresponding units were similar to responding units for several key variables.

For some of the questions, such as determining the numbers of graduating residents entering primary care practice in underserved areas, unit heads most likely provided estimates rather than exact numbers. Reported data would represent approximations in these cases and should be cautiously interpreted. Also, much of our data was expressed in terms of units regardless of variations in their sizes, and our survey instrument lacked reliability and validity testing. Other groups could be surveyed, such as individual faculty members or trainees, in order to validate our reports from unit heads.

Further research in this field is needed. Developing a national directory of general internal medicine divisions and teaching units in order to sustain a database of key variables would provide an understanding of trends over time. In this way, problems, such as a decline of volunteer faculty, could be addressed before training programs are seriously undermined. Improvement of the quality and methodology for assessing the effectiveness of programs and reporting outcome data would refine the measures. Other areas of research include assessing the relative

roles of general internal medicine and other primary care physicians and sub-specialists in medical education, and comparing volunteer to full-time and part-time faculty by type, quality, and outcomes of teaching activities.

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