

# Rural Primary Care

American College of Physicians\*

■ This overview of rural health care today shows the role that internal medicine can and should play in delivering primary care to rural populations. The American College of Physicians recommends changes to improve access to and delivery of primary care in rural areas. There are six specific recommendations.

1. Implementing universal health care coverage through a system that makes primary care equally affordable to rural populations.

2. Increasing the supply of primary care providers in rural areas by lessening specialty and geographic differentials in physician income.

3. Increasing the supply of primary care providers in rural areas by changing medical education to emphasize training enough rural physicians.

4. Decreasing professional isolation in rural areas through accessible continuing medical education and through telecommunications technology.

5. Identifying tertiary care needs at the community level and using state and federal funds to assist rural hospitals where access to care would be threatened by hospital closure.

6. Using innovative delivery systems that emphasize coordination and cooperation among providers, institutions, and communities.

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The image of the rural doctor and the practice of rural medicine strike deep and resonating chords within our collective memory as physicians. Rural practice, as characterized by long-term involvement with patients and by positions of respect and leadership within the community, captures an essential part of our professional identity.

Primary care physicians provide the foundation for health care in rural communities; most rural physicians are in primary care specialties. Despite the favorable ratio between generalist and subspecialist physicians, more than 19 million persons live in rural counties with a shortage of primary care physicians. In many rural areas, especially smaller ones, the presence of primary care physicians can mean the difference between adequate health care and no health care at all.

General internists are well suited to provide rural pri-

mary care, although relatively few of them choose to locate their practices in rural areas. We believe that general internists must share responsibility for rural primary care with our colleagues in family practice and pediatrics. We present an overview of rural health care and the practice of rural primary care. We highlight some of the more promising programs within rural health care, and we recommend ways to improve access to and delivery of primary care in rural areas. Our recommendations are geared toward increasing the supply of general internists in rural areas, although most recommendations apply to family practitioners as well.

## Definitions

Definitions of "rural" vary considerably. The adequacy of each definition depends on how it is used. For statistical purposes, the most common definitions are as follows (1):

1. The U.S. Census Bureau defines the rural population as persons living in places with less than 2500 residents. Census-recognized places are either incorporated areas (such as cities, boroughs, towns, and villages) or unincorporated areas with at least 1000 residents outside of urbanized areas.

2. The U.S. Office of Management and Budget defines "nonmetropolitan" populations as persons living outside a metropolitan statistical area, which is a county or group of counties with at least 50 000 persons.

By either definition, about one fourth of the U.S. population is rural, but the two groups of persons are not identical. In this paper, we use the latter definition unless otherwise stated. Another useful concept is the "frontier" area, which is defined as counties with population densities of six or fewer persons per square mile. Geographic access to health care may be severely limited for persons in frontier areas, which are concentrated in the Great Plains and Western states.

## Demographic Characteristics of Populations and Physicians

In 1920, 49% of the U.S. population was rural (2); by 1988, this had decreased to 23%. In the same interval, the rural farm population, a distinct subset of rural, decreased even more substantially from 30% to 2% (2). The rural United States today contains a heterogeneous mix of farming, timber, tourism, and manufacturing economies, well-to-do and poor areas, cutting across a spectrum of climates and terrains. This heterogeneity underscores the importance of flexible approaches to delivering health care in rural areas.

In general, the health status of urban and rural populations differs in ways that implicate a lack of access to preventive, primary, and emergency care: Although mor-

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**Table 1. Demographic Characteristics of the Rural United States\***

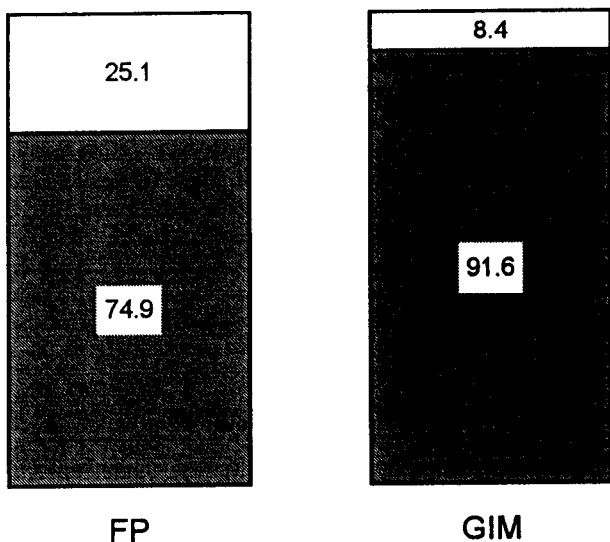
Characteristic	Rural	Nonrural
U.S. population, %	22.5	77.5
Population that is elderly, %	13	10.7
Patient care physicians (per 100 000 persons), <i>n</i>	96.3	222.5
Primary care physicians (per 100 000 persons), <i>n</i>	55.6	96.2
Population living in primary care shortage areas, %	28.4	9.5

\* Adapted from Office of Technology Assessment (2).

tality rates are 4% lower than those in urban areas, infant mortality is slightly higher and injury-related mortality is 40% higher. No differences have been noted in rates of acute illness, but rural populations have more chronic disease and disability (2). Rural populations are less likely to use preventive screening services, to exercise regularly, and to wear seat belts.

Some of the demographic characteristics of the rural United States are shown in Table 1. Rural populations are older but are served by fewer physicians. Rural areas have less than one half as many physicians per capita providing patient care as urban areas (2). The least populated counties have about 20% as many physicians as urban areas. Primary care physicians make up 57% of all physicians practicing in rural areas and 81% of all physicians in small rural counties, compared with 38% in urban areas (2). Nearly 30% of the rural population lives in Health Professional Shortage Areas, as designated by the federal government. "Shortage" is defined as a population-to-primary care physician ratio of 3500:1, reducible to 3000:1 in areas of unusually high need.

■ Nonrural □ Rural



**Figure 1. Location of family practitioners and general internists as of 1989. FP = family practitioners; GIM = general internal medicine.**

## The Role of Internal Medicine

Sixty percent of primary care physicians in rural areas are family and general practice physicians. In small rural counties, family and general practice physicians account for 91% of primary care physicians (3). In these small counties, doctors of osteopathy make up 15% of all practicing physicians, compared with 5% for the United States as a whole.

General internal medicine is under-represented in rural areas, as is shown in Figures 1 and 2. In 1988, 47% of all rural counties had no general internist, compared with 5.6% of nonrural counties. Overall, rural counties have less than one third as many general internists per capita compared with nonrural counties (4). Family physicians are the only specialists evenly distributed in rural and nonrural areas. Most of the health services research and educational initiatives for rural health are led and run by family physicians. But rural health care is too diverse and complex to fall solely within the realm of one medical specialty or of one type of medical practitioner (5).

The roles of family practitioners and general internists are complementary in rural health care. The availability of a general internist in a rural community benefits patients and family practice colleagues. The internist can provide valuable consultative and procedural skills for family practice and surgical colleagues. The strengths of family practice, internal medicine, pediatrics, and general surgery integrate well to provide comprehensive care to a community whose needs are not easily met by one specialty alone (6). Given the decreasing interest of medical students in family practice and internal medicine, collaborative and concerted action by physicians and nonphysicians is necessary to meet the primary care needs of rural areas.

### How Does Rural Medicine Differ from Urban Medicine?

We asked a nonrandom, self-selected group of rural members of the College (the Rural Health Care Advisory Group) to explain how rural practice differs from urban; their responses were remarkably consistent. We combined their responses to form a generic "job description" of the rural internist.

**WANTED:** An internist seeking an opportunity to fully implement the broad range of skills and knowledge acquired in training.

**MINIMUM REQUIREMENTS:** Competence in inpatient care, critical care, usually with reduced involvement of subspecialists; ability to do various procedures; skills in referral and consulting; ability to provide primary care as part of a team of health professionals, including other physicians and mid-level practitioners; interest and expertise in practice and business management; expertise and emphasis on preventive medicine, geriatrics, and the longitudinal care of patients and families.

**REWARDS:** Intellectual challenge from treating various patients, many with complicated illnesses needing diagnosis; satisfaction from being a community leader and from seeing the direct results of professional and community efforts on

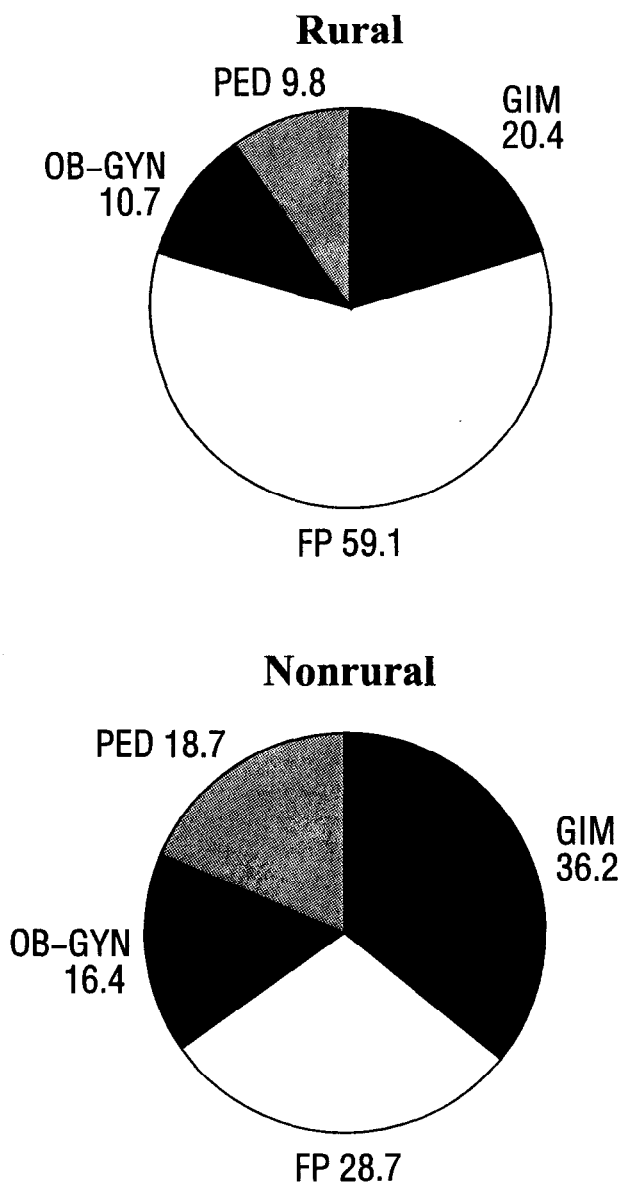


Figure 2. Specialty mix of primary care physicians in rural and nonrural areas as of 1989. FP = family practitioners; GIM = general internal medicine; OB-GYN = obstetricians-gynecologists; PED = pediatricians.

patients and families; safe and pleasant surroundings.

**COMPENSATION:** Adequate, although not equal to urban settings; long hours, often with little back up.

This anecdotal wisdom is supported by some data. In a study (7) that assessed the knowledge base of certified internists through a written examination, general internists practicing in small towns achieved higher scores than those practicing in larger communities, and general internists scored higher than subspecialists. The investigators on this study hypothesized that the higher scores of the general internists could be due to the stimulation of a broad mix of patients presenting with a diverse array of symptoms who did not have established diagnoses. They also suggested that general internists in small communi-

ties are even more likely to see patients with complicated medical problems who do not have established diagnoses, which necessitates that the rural internist maintain an excellent general knowledge base.

A survey (8) of College members documented that general internists in smaller communities do more procedures than urban general internists. Table 2 shows some of the procedures for which city size was a statistically significant variable. The survey also documented that internists in communities of less than 10 000 persons spend more hours in patient care (59 hours per week) than internists in communities of greater than 25 000 persons (50 hours per week). This information, based on anecdotes and evidence, has major implications for the training, recruitment, and retention of physicians in rural areas.

### Positions

The following recommendations were generated using the advice of the College's Rural Advisory Group (Appendix) and the experience of College members who also practice in rural areas.

#### Position 1

*The U.S. health care system must provide universal health care coverage. This system must make health care equally affordable in rural areas and urban areas.*

The economic means to pay for health care services is a necessary, although not sufficient, condition for improving access to rural health care. The statistics on economic barriers to care are grim: One of every 6 rural families (and 1 of every 8 urban families) lives in poverty, only 35.5% of the rural poor (and 44.4% of the urban poor) are covered by Medicaid, and 18.2% of rural residents younger than age 65 years (and 14.5% of urban residents) have no health insurance at all (2).

The inadequacy of health care coverage means that rural facilities and providers must shoulder increasing amounts of uncompensated care, which threatens the viability of hospitals, clinics, and physician practices. Although this is true for urban communities as well, rural facilities have a diminishing capacity to cost-shift to insured patients as wealthier patients continue to travel to medical centers away from home. This in turn erodes the community's ability to recruit and retain health care professionals, especially physicians.

The College believes that reform of the health care system is needed to achieve universal coverage, as stated in a recent paper (9). Models for health care reform include single payer, "pay-or-play," voucher systems, managed competition, and combinations of these models. One model posing particular concerns to advocates for rural health care is managed competition. As a theory, it espouses that the quality and economy of health care delivery will improve if independent provider groups compete for consumers (10). In provider- or resource-poor areas, however, competition is neither feasible nor desirable. One recent analysis (10) concluded that 29% of the U.S. population lives in health markets not capable of supporting a minimum number of competing plans and

**Table 2. Relation of City Size to Percentage of General Internists Who Do Procedures in Their Practice\***

Procedure	Percentage of General Internists			
	City Size†			
	Total Population (n = 1179)	Rural (n = 160)	Small (n = 268)	Large (n = 947)
Lumbar puncture	73	94	84	70
Joint aspiration and injection	72	90	80	69
Thoracentesis	66	92	80	62
Management of mechanical ventilator	59	87	85	53
Holter monitor interpretation	53	71	72	49
Arterial puncture for blood gases	52	85	73	47
Treadmill exercise testing, supervision, and interpretation	45	75	70	40
Repair and closure of lacerations	42	74	55	38
Endotracheal tube placement	41	78	70	35
Central venous catheter placement	39	72	61	33
Elective cardioversion	38	78	71	31
Bone marrow aspiration	37	77	58	31
Arterial cannula placement	27	56	42	23
Swan-Ganz catheter placement	22	56	46	16
Temporary venous pacemaker placement	20	62	49	14

\* Adapted from Wigton and colleagues (8)

† Large = cities with more than 25 000 persons; n = number of general internists; rural = areas with fewer than 10 000 persons; small = cities with fewer than 25 000 persons.

that 37% of the population lives in areas not capable of supporting competing hospital facilities or tertiary services. The authors of this analysis concluded that "smaller metropolitan areas and rural areas would require alternative forms of organization and regulation of health care providers to improve quality and economy."

We agree with the concerns of the National Rural Health Association (11) that "any serious proposal based on market competition must first and foremost deal with the issue of resource availability... to ensure that sufficient providers exist to compete for the available customers of care in rural areas."

However, we do see great promise in approaches that provide incentives for providers and institutions to form referral and financial networks, especially in areas with scarce resources. These arrangements have the potential to assure that rural populations have access to the tertiary and specialized services that a small community cannot support on its own.

## Position 2

*To increase the supply of physicians in rural practice, financial and practical barriers must be overcome. Historical inequities in payment policies and income need to be changed; recruitment programs in the public and private sector should offer financial incentives for physicians to establish practices. Recruitment efforts should also include physicians' families and lifestyle considerations.*

Even with universal health insurance, rural populations cannot obtain the care they need if the appropriate specialty mix and number of health professionals are not there to deliver it. Broad consensus now exists on the need to change the geographic and specialty distribution of physicians in order to care for everyone more appropriately (12). The proportion of physicians who are generalists (family physicians, general internists, and general pediatricians) has declined from 42% in 1965 to less than

30% today (13). The trend toward subspecialization affects the geographic distribution of physicians as well because subspecialists need a larger population base to support a practice; thus, subspecialists settle overwhelmingly in urban areas (14).

A program of universal health insurance would markedly increase the demand for generalists (by one estimate [12], patient contacts with primary physicians would increase 13% to 15%). Therefore, there is an acute need to increase the number of generalist physicians and to increase the number of them in rural practice. Proposals to increase the number of rural generalists can be grouped into two categories. One group emphasizes changes in the selection and training of medical students, whereas the other group focuses on improving the practice environment and enhancing the economic rewards of primary care (15). In this section, we focus on the latter; recommendations for educational reform follow in the next section.

## Economic Factors

Primary care physicians earn far less than subspecialists. In 1990, the before-tax net income for a general internist averaged less than half that of a cardiologist or orthopedic surgeon; family practitioners and pediatricians earn even less than general internists. Primary care providers tend to earn, on average, about \$100 000 a year, whereas many of their subspecialist and surgical colleagues have incomes of between \$200 000 and \$300 000 (16). Dramatic payment reforms are needed to bring the incomes of generalists and specialists closer together (15, 17, 18).

Beyond the income differential between primary care and nonprimary care providers, an income differential also exists between rural and urban primary care providers. A widely held belief, with some supporting evidence, is that rural primary care providers work longer hours and have lower average incomes than their urban counter-

parts. One analysis (19) found that general practitioners and family physicians generally earn the same amount in rural and urban areas, although data (20) from the American Medical Association indicate that rural family physicians work 4 more hours and see 23 more patients per week than urban family physicians. The same analysis found that rural pediatricians and general internists earn substantially less than their urban colleagues.

Payment reforms are essential to change the economic disincentives to practice in rural areas. The Medicare Fee Schedule has lessened but not eliminated geographic differentials in Medicare payments to health care providers. As many groups and reports have noted, lower costs of living in rural areas may be misleading in terms of physician expenses; to attract high-quality professionals, rural physicians often must pay office staff as much as or more than their urban counterparts pay.

Medicare pays a 10% bonus to physicians providing services in Health Professional Shortage Areas. In a recent analysis (21), the Physician Payment Review Commission noted that this payment might encourage practicing physicians to stay in underserved areas but would not likely motivate physicians to move to these areas. This bonus should be increased to provide greater incentives for physicians to locate in areas of highest need. The Commission also noted the high correlation between rural poverty and limited access to care, even in areas not designated as shortage areas. It recommended that rural counties with poverty rates of more than 25% should automatically qualify for the Medicare bonus payment. We urge Congress to implement that recommendation.

Payment reform alone cannot be expected to alleviate the physician shortage in all rural areas, especially in more remote locations. As of September 1993, 2448 primary care shortage areas existed in the country (70% of them rural), and the federal government estimates it would take 4559 primary care physicians to eliminate them (22). The number of shortage areas has actually increased since 1986; this fact alone emphasizes the need for direct deployment of health professionals by the federal government through the National Health Service Corps.

The Corps, begun in 1971, recruits health professionals in four ways: a scholarship program for health professions students; a loan repayment program begun in 1988 for physicians, nurse-practitioners, and certified nurse-midwives; a volunteer program; and a commissioned officers corps. At its peak in 1986, the Corps had a field strength of 3304 persons, mostly physicians. However, the scholarship program was not funded in 1987 and not reauthorized until 1990. From a high of 1600 obligated scholars in 1985, the available scholars declined to 123 in 1990 (23). Despite funding increases in the past few years, the number of Corps personnel in the field and in the pipeline remains well below its previous strength. The 1993 fiscal year appropriation of \$118 million still falls short of the 1980 funding level of \$154 million. We call for immediate and substantial expansion of the National Health Service Corps to provide the personnel needed to decrease the number of shortage areas.

This expansion must be accompanied by a review and revision of Corps programs to improve retention of physicians in rural areas. One study (24) compared Corps

and non-Corps retention after 8 years and found that rural Corps physicians are less likely than other rural physicians to stay in their communities beyond the initial service requirements. The authors hypothesized that low provider morale, a flawed site-placement process, and bureaucratic management policies might be hampering long-term retention of Corps physicians. The reasons for this phenomenon must be identified and addressed if the Corps is to be more than a short-term solution to the broader problem of geographic maldistribution of physicians.

Loan-forgiveness programs may provide incentives for young physicians to locate their practices in rural areas. Several states are exploring this mechanism. For example, Tennessee provides up to \$50 000 in loan forgiveness to primary care doctors who agree to practice for 2.5 years in an underserved area; Texas offers \$9000 per year for 5 years (25). Other states offer start-up grants or interest-free loans for new practices and income subsidies (25). It is too early to tell if these programs have had a substantial effect on the distribution of physicians. But given the increasing debt load of medical graduates, states and communities need to use strong economic incentives to bring physicians to rural areas and to keep them there.

### *Lifestyle Factors*

Economic factors alone do not determine where physicians choose to practice. Personal and family considerations also play a role, and communities must take these quality-of-life factors into account. New physicians may look at employment possibilities for spouses, at educational opportunities for children, and at perceived social and cultural resources. They may consider time factors—time not on call, time off for vacations—in making decisions about a practice location. Successful recruitment strategies should focus on the physician and family and should “sell” the rural community as a desirable place to live and practice medicine.

### *Position 3*

*Medical schools and residency programs must acknowledge their responsibility to produce physicians willing and able to meet the needs of rural populations. Undergraduate and graduate medical education should give increased emphasis to primary care and should provide increased opportunities for training in nonurban settings.*

The Association of American Medical Colleges has called on medical schools to commit themselves to the goal of having most graduating students plan generalist careers (26).

As strategies are devised to change the specialty maldistribution of physicians, the geographic maldistribution must be tackled as well. Studies (27) have shown that “physicians who have been reared in rural locations or who have received a portion of their medical education or postgraduate medical education in rural areas . . . have a substantially greater than average propensity to set up practices in rural areas.” In a random sample of residency programs in ten specialties, one study (27) found that more than 40% of physicians had moved less than 10

**Table 3. Relation of Rural Background to Medical Students' Practice Plans**

Variable	Graduating Medical Students	
	From Rural Backgrounds	From Nonrural Backgrounds
U.S. medical school enrollment, %	17	83
Choosing primary care specialties, %	22	14
Planning to practice in rural areas, %	13	3

\* Adapted from Kassebaum and colleagues (32).

miles from their residencies to their first practice site and more than 50% had moved less than 75 miles. Primary care physicians moved substantially shorter distances than did those from other specialties (27). Medical schools and residencies, especially those located in rural states, should capitalize on this observation to recruit, encourage, and produce the kind of physicians needed.

#### *Medical School Strategies*

Selective admissions of students from rural backgrounds has been suggested as a way to increase the number of rural physicians (28). Several programs have had success with selective recruitment and admissions strategies. Jefferson Medical College in Pennsylvania, the state with the largest rural population by the U.S. Census Bureau definition, initiated the Physician Shortage Area Program in 1974. The program recruits students from rural backgrounds; gives them more financial aid than is usually awarded to Jefferson students; and provides them with a special family medicine program, including a family medicine faculty advisor, a required third-year clerkship in family medicine in a rural location, and a senior outpatient subinternship, frequently consisting of a preceptorship with a rural family practitioner.

A recent evaluation (29) found that the 148 graduates of the program from 1978 through 1986 were four times as likely as other Jefferson medical graduates to practice family medicine, to practice in a rural area, and to practice in underserved areas. Overall, 85% of program graduates were either practicing a primary care specialty or practicing in a rural, small metropolitan, or physician shortage area. The author (29) concluded that "medical schools can have a substantial influence on the distribution of physicians according to specialty choice and the geographic location of their practices, principally through admission criteria." Other successes have been reported in the Upper Peninsula Program at Michigan State (30) and in the WAMI (Washington, Alaska, Montana, Idaho) Program based at the University of Washington (31).

A 1992 survey (32) of graduating medical students showed that just 5% indicated plans to practice in rural areas. The survey confirmed that students from rural backgrounds are more likely to plan rural practices and more likely to go into primary care (particularly family practice), as shown in Table 3. This study points out the strengths and weaknesses of a selective recruitment strategy. Because rural students make up such a small part of

the enrollment in U.S. medical schools, they can have only a limited effect on the geographic and specialty maldistribution of physicians nationwide. Even by doubling the admissions of rural students, the percentage of graduates planning certification in primary care specialties would change from 15% to 17%, and the percentage of graduates planning rural practice would increase from 5% to 7%. The authors (32) concluded that selective admissions strategies should be augmented by efforts to increase the interest in primary care and rural practice in all entering students.

Public medical schools have led the way in devising strategies to graduate more physicians choosing primary care in rural areas (33). One example is the Rural Physician Associate Program at the University of Minnesota Medical School. Established in 1971, the program is a clinical education experience for third-year medical students that lasts about 9 months. The students work directly with practicing physicians (mostly family physicians) in rural areas. The results have been impressive. Of 457 program graduates in practice throughout the United States in January 1991, 74% had chosen primary care and about 60% practiced in rural areas. Most graduates chose to stay in Minnesota, where they have been instrumental in improving access to primary care for almost all counties (34).

#### *Postgraduate Training Strategies*

Successful programs have two focal points: exposure of medical students to rural practice sites at the time they are impressionable about career decisions and exposure of residents to rural practice at a time when they are choosing the kind of practice they want. For example, the Maine Medical Center cooperates with the University of Vermont and Dartmouth College in placing medical students in rural sites in the third year; the internal medicine residency at the Maine Medical Center offers residents a choice of practice sites in the second or third year, including solo, small group, or hospital-based practice, and a choice of places ranging from resort areas to mill towns.

Another model can be found in state Area Health Education Centers, which have been federally funded since 1972. Since its inception, the program has involved 37 states, 55 medical schools, other health professional schools, and 117 local community centers (35). The centers provide decentralized training experiences for students and residents, and in some states, the program supports primary care resident positions. One study (35) assessed the effect of the centers during two decades and found that they "have unique functions that appear to have benefited the target community of regions, participating schools, students and medical school residents." In North Carolina, for example, the program involves a partnership among nine centers and the four medical schools. State funds are available for 300 grants of \$15 000 each to support primary care residencies based in the centers. These residencies have greatly contributed to the supply of primary care physicians in rural North Carolina: Sixty-eight percent of all family practice residents trained in this program have chosen to stay in the state and 43% have chosen towns of fewer than 10 000 persons (36).

It is not realistic to expect physicians to practice in ways

and areas with which they are unfamiliar. Internists more readily practice in rural areas when their postgraduate training gives them relevant experiences to do so. Many leaders in internal medicine are now calling for curricular reform, in one way or another, to train internists to meet the challenges of the nineties (37). Curricular changes should recognize that needs of internists in rural settings differ from those of urban internists because of the nature of rural practice. The range and diversity of rural practice demand more extensive training in fields usually left to subspecialists in urban areas, such as intensive care therapy, pulmonology, cardiology, and oncology. The long-term nature of physician-patient relationships in rural areas necessitates a strong background in preventive medicine, community health principles, and psychosocial issues. Economic realities dictate that residents be exposed to various modes of rural practice and gain expertise in practice management.

The training of rural internists should reflect the fact that most rural care is delivered in the community, not in hospitals. Community-based training has been featured in primary care track residencies in internal medicine, in marked contrast to traditional programs (38). Since 1976, federal funds (through Title VII of the Health Professions Educational Assistance Act) have supported primary care programs, which currently encompass about 7% of all residency positions in internal medicine. Recent studies (39, 40) have documented that graduates of these primary care tracks go into general internal medicine in overwhelming numbers and often practice in shortage areas. These primary care programs provide residents with more training in ambulatory settings than traditional internal medicine programs and also provide more inpatient experience than most family practice programs (41).

However, encouraging more residents to choose primary care is not the same as encouraging them to practice in rural areas. Recognizing this, in the late 1980s, our colleagues in family medicine began rural tracks in four residencies. In these tracks, the resident spends the first year in an urban tertiary center and spends the last 2 years mostly in a distant rural community with members of a rural family practice serving as primary faculty. Preliminary reports (42) indicate that graduates of these tracks do as well, if not better, on in-training examinations and become credentialed in more procedures than traditional graduates. In internal medicine, one rural track exists at the Mary Imogene Bassett Hospital in Cooperstown, New York. The program emphasizes a strong curriculum in ambulatory medicine, including formalized training in behavioral, preventive, and community medicine. Residents spend blocks of time at community-based clinics in surrounding rural communities and in "Farm Health Clinic," a rural occupational health and preventive medicine clinic. The Bassett program is too new to evaluate (Dalton J. Personal communication) but is a model that should be studied for its success in matching training experiences to the realities of rural practice and in producing physicians that fit the "job description" of the rural internist.

Innovations in primary, rural, or "open" track residencies cannot happen on a large scale without an infusion of funds to support graduate medical education in the ambulatory setting. The current system of financing graduate

medical education must be revamped. Most likely, this revision necessitates obtaining equitable support for graduate medical education from all payers, not just Medicare, in a reformed health care system. A full discussion of this issue lies beyond the scope of this paper; however, it is an essential part of ensuring a supply of rural primary care physicians.

#### Position 4

*Professional and social isolation decreases the attractiveness of rural practice. Programs that deliver continuing medical education in rural areas; telecommunications technology that overcomes distance barriers; and locum tenens programs that give rural physicians the time to travel must be established, tested, and expanded.*

Physicians, urban and rural, rely heavily on interactions with colleagues for personal and professional growth. Because of time and distance barriers, rural physicians often have difficulty attending courses and meetings, which is the usual way physicians keep up-to-date and continue their medical education. The availability of continuing medical education programs is crucial for attracting and retaining rural physicians. Beyond assuring that rural physicians maintain the knowledge base and skills they need, continuing medical education programs serve to lessen the professional isolation that physicians might feel in rural areas, particularly where other physicians are scarce.

The most promising continuing medical education programs revolve around the Area Health Education Centers. The centers link the resources of academia with the needs of small, rural communities. A good example of an Area Health Education Center is the 20-year-old WAMI Program based at the University of Washington. The medical school coordinates a program of five educational centers in four states that provides continuing medical education for physicians and educational assistance to health care institutions. The Washington Program has played a major role in improving the education and distribution of health care professionals in underserved communities in the four states.

#### *Telecommunications Technology*

Several rural states are in the midst of demonstration projects (43) using telecommunications technology for telemedicine (two-way interactive video consultations), teleradiology (transmission of still images for interpretation), and distance learning (provision of information and continuing education programs). The cost-effectiveness and acceptability of telemedicine need to be evaluated; nevertheless, the technology (especially for distance learning) offers some of the most exciting and promising opportunities to decrease professional isolation in rural areas.

One example is Texas Tech MEDNET, a 3-year demonstration project partially funded by a \$1.9 million grant from the federal government. The project, which ended in 1992, evolved into an expanded telecommunications system known as HealthNet, funded by the state and a private foundation. The Texas Tech MEDNET involved an interactive video telecommunications network that

linked rural hospitals and health care professionals. Three services were provided to rural practitioners linked to one of four Texas Tech campuses.

1. Clinical consultation using point-to-point interactive digital video. Primary care physicians in rural hospitals communicated with physicians in larger centers for consultation and diagnosis. Patients were "seen" through live video, and their images were transmitted digitally through wideband telephone lines. During the project, Texas Tech did 181 consultations between its Health Sciences Center and two rural hospitals. An independent analysis of random consultations found savings of \$980 per patient (including all costs) because of this service. Additionally, rural hospitals reported (44) that video consultations increased community confidence in the rural hospitals and physicians, improved patient compliance, and reduced patient mortality.

2. Continuing medical education using satellite technology. Texas Tech provides live programs, including feedback and telephone questions from the participants. In the grant period, MEDNET provided more than 225 continuing education programs by satellite to a network of 48 subscribing hospitals. Components included accredited grand rounds, case conferences, seminars, and workshops, all tailored to rural health care. An evaluation (44) of the continuing medical education service indicated that viewers thought that the programs help reduce clinical risk, increase the quality of care, and lessen the caregiver's sense of professional isolation.

3. Exchange and analysis of radiographs, slides, and other still images using telephone lines for transmission. A three-site rural radiology network was supported by this demonstration. The cost and complexity of the equipment prevented widespread acceptance of this service, which was used 35 times in the course of the project (44).

4. Medical information and consultation using telefacsimile. The telefacsimile network was created initially to provide rural practitioners with quick access to library resources available in the four campuses. Physicians found that they could also use the facsimile machines to transmit fetal monitoring readouts to Texas Tech for consultations. In more than 90% of those consultations, rural physicians, in conjunction with Texas Tech specialists, were able to treat newborn infants with abnormal test results in their rural hospital without having to transfer them to an urban neonatal center (44).

### *Locum Tenens*

Another promising strategy to lessen professional isolation in rural areas involves "locum tenens" programs that give physicians time to travel by providing short-term replacements for office practitioners. In the usual arrangement, the practitioner pays a fee to a private agency that in turn pays the substitute physician. For many rural physicians in solo practice, paying for locum tenens coverage is the only way to take time away from the practice. However, the locum tenens mechanism has not been explored for its potential to meet training and service needs. Could it be used to link academic centers and private practitioners in a "swap" where faculty and senior residents cover a private practice while the rural physician travels to the academic center for teaching duties or a

minifellowship? Such a program could give the academic institution access to rural practice sites for ambulatory training, provide residents with positive rural experiences, expose residents within the institution to rural role models, and give rural practitioners the opportunity to teach and learn new skills. It is an idea that should be explored, funded, and evaluated for the positive effect it could have on recruitment and retention of rural physicians.

### Position 5

*Rural hospitals, as a group, have been particularly hard-hit economically in the past decade. State and federal programs must help rural hospitals adapt to changing economic climates and should target hospitals in areas where access to care would be threatened by hospital closures.*

The rural hospital has an important role in the economy and health of a community, in the community's attractiveness to physician practice, and in encouraging patients to seek care within the community. Not all communities can or should support a full-service hospital; each community must identify its needs, examine its resources, and develop referral networks to assure that its tertiary care needs are met. Proximity to a hospital is an important factor in physicians' decisions on where to locate their practices (20). It is especially important to internists, whose training prepares them to manage inpatient care. Thus, the survival of many rural hospitals, in some form, is key in assuring access to inpatient and emergency care and in recruiting and retaining physicians to rural areas.

The number of rural community hospitals decreased by 235 (9%) from 1980 to 1988 (45). In a recent report (46), the U.S. General Accounting Office reviewed the causes and consequences of the many rural hospital closures in the 1980s. Factors contributing to an increased risk for closure included small size, low occupancy rate, low patient case complexity, for-profit ownership, weak local economies, and competition from neighboring hospitals. Because rural hospitals have many of these characteristics, they were particularly vulnerable to closure. Closures in one third of the areas studied seemed to lessen access, especially for Medicaid patients, the uninsured, and those needing emergency care. The General Accounting Office recommended that states identify areas where access to care would be decreased by hospital closures and that federal and state assistance to hospitals be targeted to those areas.

Several federal programs might help rural hospitals facing decreasing occupancy rates and fewer paying patients. The most promising are those that encourage flexible approaches to solving problems at a local level—whether that means relaxing burdensome requirements for Medicare reimbursement, downsizing, converting to an alternative health facility, or using swing-bed strategies (between acute and long-term care beds). Three programs are especially notable.

1. The Rural Health Care Transition Grant Program is designed to help small hospitals change their type and mix of services. Nonprofit acute-care hospitals are eligible for grants of up to \$50 000 per year; in fiscal year 1992, grants were made to 163 facilities in 44 states.



2. The Essential Access Community Hospital Program encourages states and hospitals to experiment with alternatives to full-service hospitals and to develop regionalized rural health networks. One alternative, the Rural Primary Care Hospital, provides 24-hour emergency care, no more than six inpatient beds, and temporary inpatient care for 72 hours or less. The primary care hospital must have an arrangement with a facility in the program having at least 75 beds. This program enables these less-than-full-service facilities to obtain Medicare reimbursement for their inpatient and outpatient services. A recent study (47) concluded that some of the requirements of the program, such as the 72-hour and six-bed limit, may be unnecessarily limiting its ability to help many rural hospitals.

3. The Sole Community Hospital Provision provides favorable Medicare payments to hospitals isolated from other hospitals by distance, travel time, or weather conditions. In 1991, about 23% of all rural hospitals carried this designation, which resulted in an average increase in payments of about 13% (48).

These programs must continue to be funded, and concerted efforts must be made to publicize them and increase their use.

#### Position 6

*Rural communities must devise and support innovative ways of delivering health care. These approaches should emphasize cooperation and coordination among providers (physicians and nonphysicians alike), among institutions in neighboring communities, and among tertiary centers and should maximize use of both medical and nonmedical (social, transportation) resources.*

Innovative approaches are needed to integrate health services in rural areas. No one model can work for all rural areas, given their diversity and range of health care needs and resources. One successful model for delivering health care in underserved areas can be found in the community and migrant health centers, which have been federally funded for the past 25 years. In 1990, the centers served six million persons in 543 centers throughout the country, 330 of which are in rural areas (49). Although they receive federal funds, the centers are "owned" by the community and operate as nonprofit businesses. They are run by a volunteer board composed of leaders and residents of the community that they serve.

What distinguishes these centers as a model for rural health care delivery is their emphasis on coordination and integration of care. Each center prepares a health care plan describing the specific health care needs of the community and the specific health promotion to use in meeting those needs. In order to maximize limited resources, many centers have developed linkages with local health departments, hospitals, nursing homes, and other providers. Most centers offer a broad range of preventive and social services in a "one-stop shopping" environment.

Community and migrant health centers can also serve as ambulatory training sites that can both satisfy immediate service needs in the community and help recruit future physicians. A survey (49) of all federally supported graduate medical education programs found 39 residency

programs at 53 health centers with a short block or longitudinal experience for medical residents. Greater support from the payers of graduate medical education, especially Medicare and Medicaid, is needed to expand and develop these "teaching community health centers."

Another example of combining training and service delivery is the "teaching office practice" established and operated by the University of Virginia for the past 10 years (50). The practice was set up in Orange, Virginia, located 30 miles from the university in a county of 18 000 without a physician. Three general internal medicine faculty run the practice, and residents rotate through it for 10 weeks in their second year. The curriculum includes experience in patient care, community service, and practice management. Income from the practice covers all expenses (excluding physician salaries). An evaluation of the program concluded that the rotation helped provide a balanced view of internal medicine practice and substantially influenced residents' career choice (50).

There are other models of rural health care delivery in the private sector. A few examples, culled from our Rural Advisory Group, follow.

1. The Oxford Hills Internal Medicine Group (Norway, Maine): an 18-year-old group practice composed of five general internists in a town of 4500 persons. The catchment area is much larger, and the practice now includes more than 8000 patients. One secret of their success: Each physician does certain procedures commonly referred to subspecialists in other settings, such as implanting pacemakers; taking liver biopsy specimens; doing endoscopy, sigmoidoscopy, and colonoscopy procedures; and reading echocardiograms (51).

2. The Marshfield Clinic (Marshfield, Wisconsin): a system composed of a central facility and 22 regional satellites, connected administratively and electronically. The satellite clinics are staffed by anywhere from 1 to 30 physicians; to overcome financial barriers to rural primary care practice, the salary system provides cross-subsidization for the provision of appropriate care in the service area.

3. United Clinics (Hettinger, North Dakota): a group practice begun in the mid-1960s, composed of 7 family physicians, 2 internists, 1 pediatrician, 1 general surgeon, 2 radiologists, 3 nurse practitioners, and 2 physician assistants. The practice is located in a town of 1800 persons, but it is also the sole source of primary care to more than 30 000 persons in small communities in three states. The primary care providers, including the physician assistants, regularly drive or fly to neighboring communities (52).

#### *Nonphysician Providers*

The role of mid-level practitioners (nurse practitioners, physician assistants, certified nurse-midwives, and certified registered nurse-anesthetists) is key in rural health care. These practitioners have the training and ability to provide a limited range of services traditionally considered within the physician's scope of practice. Nurse practitioners, in particular, often practice in rural satellite clinics under supervision of physicians in neighboring communities. The satellite clinic model can address the health needs of small and remote communities while offering the

economic and professional arrangements of group practice (2).

Many groups are now acknowledging the importance of mid-level practitioners in assuring access to primary care. The Rural Health Clinic Services Act provides a reimbursement mechanism under Medicare and Medicaid for the services of mid-level practitioners in rural underserved areas. The American Academy of Family Physicians recently released guidelines on the supervision of these practitioners that emphasize the physician's responsibility to direct, coordinate, and review such care (53). As physicians, we must increase our ability to work as a team with other health professionals and to provide the necessary backup to them in rural areas.

### *Overcoming Distance Barriers*

One of the biggest barriers to care in rural areas is distance: distance between patients and physicians, physicians and colleagues, physicians and facilities, and communities and academic medical centers. Approaches that use funds and technologies to decrease the isolating effects of this distance have the greatest impact on rural health care.

Transportation to health facilities may be the key in more remote locations, especially in achieving access to services not sustainable in sparsely populated regions. Most remote counties have no public transportation system at all. In a recent speech, Dr. M. Joycelyn Elders (former U.S. Surgeon General) noted that it is cheaper to train a bus driver than it is to train a doctor; she noted that 35% of all rural residents have no transportation (54). Federal and state funds should be used for demonstration projects that provide regularly scheduled transport to health care facilities in remote or frontier counties. Transportation systems, ground and air, have also been identified as a key part of improving emergency medical services in rural areas. Although beyond the scope of this paper, rural access to emergency cardiac and trauma services must be improved (55).

### **Conclusion**

We believe that internal medicine can meet the challenges of rural health care. General internists can and must share responsibility for delivering rural primary care with family practitioners, pediatricians, and nonphysician providers. We recommend increasing access to primary care for rural populations by changing the economic, educational, and practical disincentives toward rural practice. There are six specific recommendations.

1. Implementing universal health care coverage through a system that makes primary care equally affordable to rural populations.

2. Increasing the supply of primary care providers in rural areas by lessening specialty and geographic differentials in income.

3. Increasing the supply of primary care providers in rural areas by changing medical education to emphasize the production of rural physicians.

4. Decreasing professional isolation in rural areas through accessible continuing medical education and through the use of telecommunications technology.

5. Identifying tertiary care needs at the community level and using state and federal funds to assist rural hospitals where access to care would be threatened by hospital closure.

6. Using innovative delivery systems that emphasize coordination and cooperation among providers, institutions, and communities.

### **Appendix**

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