

## Chapter 30: Rural Health Care: Communities, Systems, and Patient Care

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### OBJECTIVES

Describe the demographics and characteristics of rural patients.

Identify common vulnerabilities among rural populations.

Outline the health issues faced by rural Americans.

Review the unique relationship between rural living and health.

Highlight challenges to care of rural patients from the perspective of the individual provider and the health system.

Discuss strategies and initiatives to improve health care of rural residents.

### INTRODUCTION

“Rural” is a term that elicits a variety of meanings and images such as farms, expansive landscapes, or small towns. For some, it is a state of mind or a feeling. Others contend its definition is quantifiable by population density or other measures. Although there are many definitions, all attempt to describe something socially and geographically different from urban areas.

The number of Americans living in rural areas has been declining; however, their numbers are substantial. The 2010 US census reported 19% of the population lives in rural areas and 75% of the US landmass is nonmetropolitan.<sup>1</sup> Globally, 3.4 billion people, or just under half of the world’s population, live in rural areas.<sup>2</sup> Within rural populations, there are many who struggle with health and health care. This chapter identifies and discusses some of the vulnerabilities and health challenges specific to rural populations, the context of rural health systems, and key issues for health-care providers in rural communities.

### RURAL LIVING

The social fabric of rural communities is complex and can vary greatly. The smaller scale of rural towns can frequently facilitate an interconnectedness and reciprocity among its inhabitants. People living in small towns tend to know their neighbors and interact with them in multiple settings. This interconnectedness

lends itself to grassroots responses to local issues. Community action is frequently organized through churches, civic groups, and local government. These institutions and their leadership can often set the agenda for civic priorities.<sup>3,4</sup> It is no surprise that community-oriented primary care, with its focus on broad community needs that are fundamental to health, has its roots in rural health.

Although there are pockets of prosperity and economic growth in rural communities, many rural economies are on the decline. In recent decades, particularly in developing countries, people are migrating from rural areas to urban centers. This *rural flight* is spurred by the lack of economic opportunities in rural areas and the perception that larger cities hold the promise of better jobs and more educational opportunities.<sup>5</sup>

## RURAL POPULATIONS AND HEALTH INEQUALITIES

Concentrated poverty, low education levels, and hazardous occupations have been major contributing factors in the health inequalities found in rural places compared to urban cities. In line with global trends, rural Americans experience a significantly higher mortality rate than those living in urban areas.<sup>6</sup> Although activities such as mining, agriculture, and farming are on the decline, they are exclusively rural industries, and they are among the most hazardous occupations. Each year, for example, approximately 10% of farmers are injured while working; their injuries are often multiple and severe, resulting in death or substantial disability.

Obesity is another challenge for rural Americans. Rural populations are 20% more likely to be obese compared with those living in urban areas.<sup>7</sup> Some studies have indicated that rural people have a diet that is higher in fat and consume fewer fruits and vegetables. Ironically, rural communities, often the producers of fruits and vegetables, have less access to healthy foods than urban areas.<sup>8</sup> Rural people have to travel farther to grocery stores, where there is frequently less of a selection of fresh foods compared with urban areas.

The lack of physical activity is another contributing factor to rural obesity in the United States. Rural people tend to exercise less than urbanites.<sup>9</sup> Some researchers believe physical isolation is one barrier to regular exercise. Rural areas often have sprawling settlement patterns, encouraging people to walk less and drive more. Rural school children, for example, are more likely to ride the bus than walk to school. Sidewalks and trails also tend to be less prevalent in rural areas, reducing the opportunity to walk safely to local destinations; exercise facilities and sports teams may also be less accessible.<sup>9</sup>

Suicide represents another significant health disparity for rural America. Since the 1970s, rural counties have experienced a significantly higher suicide rate compared with urban areas. Risk factors for suicide such as depression, isolation, economic worries, and [alcohol](#) are exacerbated by the relative dearth of mental health care. Rural gun culture is also widely believed to contribute to the suicide disparity: three out of four suicides in rural America involve firearms.<sup>10</sup>

## SPECIAL POPULATIONS IN RURAL HEALTH

Similar to urban areas, rural America is a dynamic and constantly evolving social and economic landscape. Creating accessible and equitable health systems has been a major challenge for rural counties that have experienced this recent and dramatic demographic trend.

Although each rural community represents a unique social amalgamation of waves of migration, there are some distinguishable national trends. Hispanic migration to rural areas has dramatically changed the cultural composition of many rural communities, and since 1980 the number of Hispanics living in rural America has more than doubled.<sup>11</sup> Migrants from Mexico, Central America, and the Caribbean provide a much needed labor force for agricultural industries and contribute to small town economies. While this migration began in the southwest, it now encompasses all continental states and Alaska.

Many Hispanics, particularly those working as migrant agricultural laborers, face significant barriers to health and health care. Language barriers may prevent them from effectively navigating social or clinical institutions. They often live in poverty, have substandard housing, and may be further marginalized if they are undocumented immigrants. Educational opportunities for the children of migrant workers are also limited and few obtain higher educational degrees.<sup>12</sup> The health consequences of these upstream factors cannot be understated.

American Indian (AI) and Alaska Natives (AN) are other populations with unique histories and special health needs in rural America: many AI/ANs are committed or constrained to living in rural areas, almost all reservations are located in rural areas, and most of the tribal governments own rural land. The percentage of AI/AN adults living in poverty is among the highest compared with other racial/ethnic groups, and housing conditions for many Native Americans are substandard.<sup>13</sup> Native Americans have lower life expectancies and worse health statistics than any other ethnic group in the United States. AI/AN have higher mortality rates from tuberculosis, chronic liver disease and cirrhosis, accidents, diabetes, pneumonia, suicide, and homicide compared with other racial and ethnic groups.<sup>14</sup> These trends date back to the historical trauma experienced when contact was made with European settlers, subsequent inequitable treaties, and dislocation to reservations. Additionally, cultural barriers and geographic isolation have added further obstacles for AI/AN populations to receiving adequate health care.

Rural communities are aging. The proportion of US residents over 65 years old is 14.6% in rural areas compared with 11.9% in urban areas.<sup>15</sup> The rural elderly are largely nonminority, less educated, poorer, and more likely to live in substandard housing compared with metropolitan elderly. Rural communities lack specialized transportation and geriatric services, resulting in special health challenges for the elderly and the providers that care for them.

## **RURAL HEALTH-CARE ACCESS AND SERVICES**

### **CORE ELEMENTS OF RURAL HEALTH DELIVERY**

At least three core elements provide the basis for a stable rural health-care system: strategically placed and stable hospitals, clinics, and support services; adequate health professions workforce; and sufficient

health-care financing. Political commitment and policy interventions targeting these elements are essential to maintaining viable rural health-care systems in the United States and globally.<sup>16</sup>

### **Hospitals, Clinics, and Ancillary Services**

The economic and community value of hospitals, clinics, and other health-care services are critical factors in linking together the various components of the rural health-care system. In addition, rural hospitals are often the largest employer in the community and play a substantial role in recruiting and retaining physicians and other health-care professionals. Communities that have stable and adequate health-care services also become magnets for other new businesses, recreation, retirement, and referrals to ancillary health services.

The vitality of hospitals to rural communities became apparent in the 1980s in the United States, when reduction in Medicare payments, coupled with a slowing economy and population movement away from rural areas, contributed to the collapse of 160 small and rural hospitals.<sup>17</sup> The effect on these communities was so devastating that Congress responded by providing grants to develop rural health networks, to regionalize services, sustain local emergency medical system (EMS), and increase quality of care. The Critical Access Hospital (CAH) program was one of the initiatives that sought to stabilize the financial impacts on rural hospitals and reverse some closures that had left communities without adequate access to hospital-based services.<sup>18,19</sup> To be designated a CAH and eligible for enhanced reimbursements, hospitals had to be located in a defined (federal or state) rural areas; be 35 miles distant to the next closest acute care hospital (or 15 miles if the roads were through mountains or poorly maintained); have 25 acute beds maximum; and maintain an average annual 96-hour length of stay for admissions.<sup>6</sup>

CAHs have played a significant role in consolidating services in rural communities. Physicians have increasingly merged their practices with hospitals to lessen the administrative burden of federal and insurance compliance and reimbursement policies, and to allow them to focus more on patient care. In addition, the hospital-associated clinics have applied for designation as federally supported Community Health Clinics (CHC) or Rural Health Clinics (RHC) in order to receive supplemental federal payments for clinical services provided in rural locations.

These federally supported clinic systems have also been vital for improving access to health care in all underserved areas, especially rural ones. CHC, Migrant Health Clinics, Health Care for the Homeless Clinics, and Public Housing Clinics, all also known as Federally Qualified Health Centers (FQHC), are one system that provides much of the care to rural communities. About one-half of FQHCs are located in rural areas. They serve one out of every seven US rural residents, about 10 million people.

RHCs, like FQHCs, were created by Congress to enhance access to medical care. RHCs differ from FQHCs in that they do not target specific underserved populations, but rather increase access to rural areas that are identified as health professions shortage areas (HPSA). RHCs can be either independent (free standing) or provider based (as part of a hospital or nursing home) and are reimbursed for Medicare and Medicaid services through an all-inclusive rate rather than fee-for-service or prospective payment.<sup>8</sup> Key elements for

certification as an RHC include being in a nonurban area, being located in a federal/state designated HPSA, and employing physician assistants (PA), nurse practitioners (NP), certified nurse midwives (CNM), or licensed psychologists for at least 50% of the time the clinic is open for services.<sup>9</sup> Indeed, RHCs provided the first federal initiative to recognize PAs, NPs, and CNMs and to encourage their use in expanding access to health care.

## **Health Workforce—Meeting the Needs of the Future**

Doctors and health-care facilities are distributed unequally in all regions of the world, with rural areas suffering particularly from maldistribution issues. Seventy-seven percent of rural counties in the United States are designated as HPSAs and, conversely, 65% of all HPSAs are rural. Impending attrition in medicine, nursing, and dentistry as large blocks of providers reach retirement age in the next decade; declining interest in primary care disciplines; and inadequate teaching and clinical training resources are likely to compound this problem. Policymakers in the United States and globally have focused on multiple strategies to address the imbalance from providing grants and incentives to subsidize health-care systems and attract providers, to expanding the nonphysician health provider workforce.

A cornerstone to any rural health-care system is a solid base of primary care providers—primarily family practice physicians, supplemented with PAs and NPs. Details of the projected primary care shortfall are documented in multiple federal and professional association studies within the past several years, and although there may be differences in absolute numbers, there is no quarrel with the outcome—the United States<sup>20,21</sup> will be short between 20,400 and 124,000 primary care physician Full Time Employments (FTEs) by 2025. Rural areas are likely to be the hardest hit by this shortfall. Furthermore, the decline of interest in family medicine will have significant and disproportional impacts on rural communities since family physicians are the largest segment of primary care physicians practicing in rural areas.<sup>22</sup>

PAs and NPs, health professions established in the early 1960s as a response to the shortage and maldistribution of physicians, particularly in rural and underserved urban areas, have since increased their training programs and graduates, and now serve in every medical discipline and health arena. Indeed, both professions are increasing the number of programs and graduates at a much faster rate than medical schools<sup>20</sup> and have projected growth rates of 58% and 30%, respectively, between 2010 and 2020. For example, in 2013, there were 181 accredited PA programs with approximately 5971 graduates. Sixty more programs are currently pending accreditation through 2020, and that number may yet increase as demand grows. There were 84,064 practicing PAs in 2013 and projections are for an increase<sup>23</sup> up to 125,847 by 2026.

PA and NP providers fill the gap created by the continuing shortage of primary care and rural physicians: 34% of primary care providers in rural areas are PAs and NPs, and they comprise 46% of the provider base in community health centers. Slightly more than one-third of PAs and a little more than half of NPs are in primary care with approximately 14% and 18%, respectively, practicing in rural locations. Osteopathic physicians and international medical graduates (IMG) also select rural practice more frequently than allopathic physicians (18% and 13%, respectively, versus 11%).<sup>24</sup>

Since the “barefoot doctors” deployed in China over 50 years ago, use of community health workers (CHW) has been an important strategy to improving health-care access in rural areas. CHWs are typically lay people provided with some medical training who help implement specific health-care interventions. For example, CHWs have been shown to improve rates of immunization and breastfeeding, TB treatment outcomes, and reduce child morbidity and mortality.<sup>25</sup> Used extensively in lower- and middle-income countries, use of CHWs is now being adopted in the United States as well.

## **FUTURE STRATEGIES TO INCREASE THE RURAL HEALTH PROFESSIONS WORKFORCE**

Studies of strategies to increase the rural health professions workforce in the United States and internationally have consistent recommendations: broaden the medical student applicant pool to include more rural students; increase the emphasis on primary care/family medicine; provide training opportunities with rural providers and practices through medical school and residency; and provide practice and financial incentives (such as loan repayment and enhanced reimbursement) to attract and retain health-care professionals.<sup>22,26</sup>

An intervention used in many countries is to require medical students or graduates to complete national or rural service commitments as part of their educational or licensing requirements. In the United States, the National Health Service Corps (NHSC) was created to improve the distribution of health-care providers by offering financial support to physicians, PAs, NPs, pharmacists, nurses, and mental health providers who choose to work in rural and other underserved areas. Since 1972, more than 37,000 health professionals have served in the corps, with more than 7500 primary care providers currently in NHSC-supported positions. The NHSC is also creating a system to support its clinicians with training resources and a virtual community specifically designed for providers serving in isolated settings.

Other federal and state initiatives target increasing rural medical educational opportunities, recruiting people from rural communities into the health professions and increasing the numbers of IMG who practice in rural areas. IMGs comprise about 25% of the primary care workforce in the United States and in some regions are more likely to practice in rural areas than US trained doctors.

### **Telemedicine**

Telemedicine, defined by the Institute of Medicine in 1996, as “the use of electronic information and communications technologies to provide and support health care when distance separates participants,” is a rapidly evolving field.<sup>27</sup> It comprises a diversity of clinical practices and technologies that hold much promise for improving care, particularly specialty care, for rural patients. Currently, three broad categories of telemedicine are being used: (real time) interactive services, remote monitoring, and store-and-forward consultations.

Interactive telemedicine services provide real-time face-to-face interactions between patients or primary care providers and specialists and back-up physicians. Issues of responsibility, reimbursement, ethics, and effectiveness of these new technologies are just now being elucidated.

Remote monitoring, or self-monitoring, allows medical professionals to technologically monitor a patient's clinical status. Blood pressure cuffs, glucometers, ECG monitors, scales, and other devices can transmit clinical information that can be used to tailor interventions, thus obviating the need for a patient to travel long distances.

Store and forward telemedicine involves transmitting medical data (such as medical images) to a physician or medical specialist for review. It is common among specialties such as dermatology, radiology, and pathology where a delay in the specialist's assessment is acceptable.

### **Access to Facilities and Services**

Other criteria for adequate access to services are geographic proximity, availability of services, and ability to pay for services. Mountains, rivers, road and weather conditions, and transportation are key elements in defining access in rural communities.

Ferry County, in Washington State, is considered one of the most isolated regions; three-fourths of its land mass is federal/state lands. Republic is the main population center and has a critical access hospital and rural health clinic. Bounded by the Canadian border to the north, mountain ranges with sketchy passes in winter to the east and west, and the Columbia River to the south (which requires a short ferry ride to cross), access into and out of this community can be challenging. Often, and depending on weather conditions, helicopter transport is the only way to move critical patients to a tertiary hospital.

In many rural areas, services such as hospitals, clinics, and ancillary services are consolidated in larger communities such as the county seat. Public or private transportation then becomes a factor, as many areas no longer have routine bus service, and poorer populations may not have either a vehicle or gas to attend to care outside their area. Services such as home health, rehabilitation, chore service, physical therapy, and other modalities necessary for comprehensive patient care may also not be readily available. Federal and state programs that target special populations—children and the elderly, for example—may not have capacity for outreach to parts of the community who might be otherwise eligible. Lack of advanced technological and computer systems, cellular phone, and Internet access may also make access to emergency services, telemedicine systems, diagnostic testing, and educational materials more difficult.

### **Access to Health Insurance**

In looking at rural population data, it is frequently noted that many people do not have health-care insurance, a significant barrier in accessing services. Rural populations tend on average to be older, poorer, and have lower levels of education—all of which can contribute to a lower health status and a higher need for health care. The 2010 US census shows there are 49.9 million people without health insurance in the United States—16.3% of the population census 2010 shows that nationally, the metropolitan uninsured rate is 19% overall, while the non-metro rate (communities under 2500 population) is considerably higher at 23%. There are multiple reasons why there are fewer insured individuals in rural areas. Many small businesses cannot afford to pay full benefits for their workers. Some rural jobs are seasonal and/or require

only part-time work and therefore are not covered for benefits. Extended benefits to family members, dental coverage, and sick leave are also less often available to workers.

## EMERGING TRENDS IN RURAL HEALTH CARE

The Patient Protection and Affordable Care Act of 2010 (ACA) has had a transforming effect on the nature and direction of health care on multiple fronts. Far reaching and rarely discussed segments of the ACA include initiatives important to rural health delivery, including workforce, technology, information systems, financing, and a greater emphasis on patient engagement and responsibility. For rural systems and communities, the impact will hopefully be positive overall, but there will certainly be stresses as well, since operating margins are much thinner and resources are fewer than those in urban systems.

More models of successful telemedicine are emerging in areas such as mental health, dermatology, and emergency medicine. Multiple governmental agencies actively seek new proposals for innovation in this promising area.

While technology promises improved communication and coordination of care that is important to patients, providers, and systems as a whole, it brings real challenges to rural entities (Box 30-1). Increased costs for implementing technology, patient and quality monitoring requirements, and additional staffing push the financial limits for many rural hospitals and clinics. This is an issue as planned federal/state reimbursements are reduced. Information technology (IT) security for medical records and EMR implementation are very costly and the return on investment in this and other technology remains unknown.

### Box 30-1. Health Risks and Benefits of Living in Rural Communities

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Risk	Benefit
Isolation and more difficulty with privacy Stigma for social problems	Tightly knit communities
Higher rates of poverty, lower educational attainment and employment opportunities	Lower cost of living
More difficult access to care of all sorts due to less availability of services and providers, geography, and insurance	Health-care providers function as part of the community
More suicide, obesity, injury, chronic disease, cancer; higher mortality rates	



## Common Pitfalls: Understanding the Pros and Cons of Rural Practice

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Pros	Cons
<ul style="list-style-type: none"><li>• Deep relationships with patients</li><li>• Caring for friends and neighbors</li><li>• Attachment to community</li><li>• Breadth of practice</li><li>• Relative autonomy</li><li>• Participation in community leadership</li><li>• Opportunities for loan forgiveness</li><li>• Lower cost of living</li></ul>	<ul style="list-style-type: none"><li>• Lack of anonymity</li><li>• Few support services</li><li>• Practicing out of comfort zone</li><li>• Likelihood of more frequent call</li><li>• Potentially lower salary</li><li>• Fewer job opportunities for spouses</li></ul>

## CARING FOR RURAL POPULATIONS

Rural areas have higher rates of mortality and disability when compared with urban populations and their health lags behind the country as a whole. The burden of chronic disease is higher in these communities, and while the diseases often look the same as those seen elsewhere, there are special considerations that make the disease burden more profound. These include factors related to lifestyle, economy, and health-care access. Rural minorities face additional challenges with higher rates of chronic disease, hospital admission, and inpatient deaths. Lack of access to preventive services also plays a role in poor health among rural populations: data show lower levels of age-appropriate cervical cytology testing, mammography, colorectal cancer screenings, and adult vaccination rates. Decreased access to specialty care, lack of insurance, minority status, and increasing rurality exacerbate these disparities.

## CARE OF THE RURAL EMERGENCY PATIENT

T.S. is a 58-year-old man with hypertension and diabetes. He awoke with substernal chest pain that radiated to his left arm. When the pain did not improve he called the ambulance. T.S. lives outside of his community of 400 people and 40 miles from the nearest hospital. The volunteer ambulance crew arrived 20 minutes later and transported him to the hospital. The ambulance personnel placed T.S. on a monitor and administered oxygen and aspirin. No one in the ambulance crew that night was trained to place an IV and there was no equipment to do a 12-lead ECG. They administered three sprays of sublingual nitroglycerin in succession. They arrived at the emergency room 2 hours after his chest pain started.

The care of the rural emergency patient begins with the EMS. Rural EMS services are variable among communities. Providers are more likely to be volunteer emergency medical technicians (EMTs) whose training requirements vary from state to state. Compared with the paramedics and ambulance systems

commonly found in urban settings, rural EMTs and EMSs often provide fewer services.<sup>28</sup> The relative lack of volume of trauma and emergent cardiac care plays a role in EMS service experience as well.

Distances traveled by EMS providers, both to reach patients and to transport them to the hospital, can be vast and are highly dependent on weather and road conditions. The time to transport plays a role in the poorer outcomes experienced by critically ill patients, and this holds especially true for patients who may benefit most from higher levels of care. Rural trauma victims are twice as likely to die as urban trauma victims.<sup>29</sup>

When T.S. arrived at the emergency department (ED), he was met by the family physician on call for the ED, an RN, and the x-ray technician. His vitals were stable, but he continued to have chest pain. In the ED, an IV was started and morphine administered. A 12-lead ECG showed ST-segment elevation in the anterior leads. IV nitroglycerine was started.

The closest tertiary care center with specialized cardiac care treatment was 50 miles away; 60 minutes by ground or 17 minutes by air. After evaluating the patient's condition, the services available at each hospital, and the weather forecast, the team decided to transport T.S. by air for emergency cardiac catheterization. Before he left, he was treated with anticoagulants in preparation for more definitive care.

The EDs in rural hospitals can be fully equipped and staffed for nearly every need or only intermittently staffed and providing limited services. Rural EDs are more likely to be staffed by family physicians, often local doctors who have practices in the community. Some have extensive training in emergency medicine and others less. The services offered in the rural ED depend as much on the local hospital capabilities as the provider. Imaging and laboratory services may not be available 24 hours per day.

Care of the rural emergency patient will continue to develop. Protocols for determining who should bypass smaller EDs and go directly to urban centers are beneficial and continue to evolve. Faster transport times aim to increase the care delivered in the first hour posttrauma, the "Golden Hour." Using techniques pioneered by the military, the "scoop and run" doctrine is useful in civilian settings where trauma is involved and may save lives in nontrauma settings as well. Improved technology in the field and in-hospital will also play a role. ECG transmission from ambulance to base facilities, telemedicine between rural hospitals and tertiary settings, and interhospital sharing of medical records also show promise.

## **CARE OF THE RURAL OBSTETRICAL PATIENT**

J.J. is a 26-year-old G2P1 Hispanic woman at 28 weeks of gestation. Two years ago, she delivered her first baby vaginally. She presented for early prenatal care but missed her scheduled appointment at 24 weeks because she and her family left town for work in a distant cherry orchard. She presents to clinic with ruptured membranes. The nurse escorts her across the street to the hospital for fetal monitoring. A bedside ultrasound reveals a transverse lie. She is assessed for safety of transport. Her cervix is 5 cm dilated.

The practice of maternity care and obstetrics can be one of the most professionally and personally satisfying aspects of rural medicine. A provider may be able to follow up a patient through her pregnancy,

deliver her baby, and then care for the postpartum mother and the newborn. On the other hand, obstetrical practice in a rural community can be intimidating, as one may need to practice outside a typical comfort zone, and back up is sometimes scarce.

The rural pregnant patient is typically younger and poorer than her metropolitan counterpart. She is more often multiparous and a member of a minority group, and typically presents later to prenatal care, in part, due to transportation, distance to provider, and lack of insurance.<sup>30</sup> While maternity and child mortality in rural areas continue to decrease, rates remain higher than in the city.

The closing of rural hospitals or cessation of obstetrical services limits access to obstetrical care in rural areas. Obstetrical care in rural hospitals is discontinuous and unpredictable: a hospital may have no patients one day and several the next. This adds to the expense of staffing, which in turn may lead to more closure of services. Other factors that contribute to service limitations are liability, patient outmigration, lack of surgical services, and declining reimbursement.<sup>31,32</sup>

Provider issues limit access as well. The number of obstetricians practicing in rural areas is directly proportional to the population, and the provider of obstetrical care in rural areas is most often the community family physician. Unfortunately, the number of family physicians who provide obstetrical care is decreasing: from 35% in 1994 to only 19% in 2011.<sup>33</sup>

The emergence of obstetrical and rural fellowships in family medicine, rural residency tracks (RRTs) that encourage obstetrics, and the development of family medicine obstetrics board certification may improve the provider access issues. Currently, there are 31 family medicine obstetrical fellowships training between one and four fellows per year. There are 23 RRTs and an additional 12 in development. CNMs are also a part of the solution to access, as they are more likely to practice in poor and rural communities and provide safe and cost-effective care. These programs are on the rise as well.

While facility closure and a declining workforce threaten rural obstetrical care, innovations are improving outcomes with care close to home. Changes in call structures make the workload less rigorous for providers in rural areas. Technology solutions such as e-consults and live telemedicine are showing promise as well.

The Antenatal and Neonatal Guidelines, Education and Learning System (ANGELS) links clinicians and patients in Arkansas with the University of Arkansas for Medical Sciences, where virtually all of the state's high-risk pregnancy services are located. The program facilitates real-time tele-health consultation among patients, their physicians, and medical center specialists through a statewide telemedicine network; develops and disseminates guidelines to foster the use of best practices by obstetric providers across the state through interactive teleconferencing; and facilitates appropriate referrals to the medical center for tertiary care through a 24/7 patient/provider call center.

The patient is advanced in labor and too unstable to transfer to the nearest tertiary care center. She needs to be delivered via a cesarean section. The family physician asks the charge nurse to assemble the operating room (OR) team for a stat cesarean section and the ward clerk to call the neonatal transport team for the newborn. The physician last performed a cesarean section at 28-weeks' gestation when he was a

resident; he calls and consults the remote obstetrician back-up. Together, they review the technical aspects of the surgery, and the obstetric consultant stands-by on the speakerphone in the OR as the cesarean begins. The surgery goes well and the newborn is delivered safely. The helicopter carrying the NICU team from the tertiary center arrives in time to stabilize the newborn and transport him. The mother recovers well and joins her baby at the tertiary care facility in 2 days.

This case illustrates both the technical skills and the teamwork required under difficult circumstances. Despite the challenges illustrated by this case, most obstetrical patients are healthy and have wonderful, uncomplicated deliveries, bringing great joy to families and the providers who serve them.

## CARE OF THE RURAL SURGICAL PATIENT

R.S. is a 66-year-old man with diabetes who presents to his primary care provider with fatigue. He is found to be anemic with a positive fecal occult blood test. He takes nonsteroidal anti-inflammatory drugs (NSAIDs) for his arthritis and smokes a half pack of cigarettes per day. His Primary care provider (PCP) refers him to the local general surgeon for endoscopy.

General surgery is important to the rural health-care ecosystem and the rural general surgeon is an endangered species. Patient outmigration to urban facilities, costs of maintaining surgical services, changes in surgical residency training, liability, an aging workforce, decreased reimbursement, and lack of technical support (anesthesiology, radiology, pathology, etc.) are environmental factors leading to an overall decrease in the numbers of rural surgeons. Individual contributors include lifestyle issues related to long hours, increased call, and isolation.<sup>34</sup>

The absence of a general surgeon in a community can be devastating to the financial health of the local hospital and results in the loss of associated jobs and compromised hospital services including emergency and obstetrical care.<sup>31</sup> Historically, the local general practitioner or family doctor performed some general surgical procedures, including appendectomy, tonsillectomy, or herniorrhaphy. These cross-trained general practitioners have long since retired, leaving these services to the general surgeon. Many of the rural surgeons are now aging as well with limited opportunities for replacement. Graduates of surgical residencies are increasingly heading for subspecialty fellowships. Further exacerbating the decline of the rural general surgeon is that current surgical training programs are too narrow for the broad skill set needed for rural practice. In addition to the usual breast and abdominal procedures performed by general surgeons, the rural surgeon needs to be competent in upper and lower endoscopy, common gynecologic surgeries, cesarean section delivery, urologic procedures, and common orthopedic, vascular, and trauma procedures.<sup>35</sup>

An upper endoscopy was normal but a colonoscopy revealed a 4-cm mass in the sigmoid colon. Biopsy results demonstrated adenocarcinoma. A subsequent computed tomographic scan demonstrated disease confined to the colon.

Rural general surgeons report significant job satisfaction in the areas of independence, access to outdoor activities, lack of turf battles with other physicians, and community and patient relationships.<sup>36</sup> Changes in surgical training and improved incentives for rural location are needed. Rural training tracks, like the program at Oregon Health Sciences University School of Medicine, help train graduates in the skills required for rural practice. The NHSC should include general surgery in its recruitment strategy. Medicare adjustments that improve reimbursement for care in rural areas might help. Recruitment alone, however, will be inadequate. Regional cooperation and coordination of services is needed to safeguard rural general surgical services.

R.S. undergoes a left hemicolectomy at his community hospital. His family was able to visit every day as they did not need to travel to the regional center, and he was happy to be cared for by his neighbors who worked at the hospital.

## CARE OF THE RURAL MENTAL HEALTH PATIENT

T.T. is a 19-year-old woman cared for by an NP in an RHC since she was a child. She got pregnant at the age of 16 and lives with her mother who helps her care for her 3-year-old daughter. She has had periodic problems with [methamphetamine](#) but went through treatment last year and did well. Three months ago, her mother mentioned to her provider that T.T. had been emotionally labile and was sleeping all the time. She was diagnosed with depression and started on fluoxetine. She missed several follow-up appointments and 6 weeks later was found intoxicated at the local park after her mother had not seen her for 2 days. There were no dual diagnosis treatment beds available and the next open appointment with a mental health professional through the county mental health program is 1 month away. The NP adjusts her medications and plans to see her weekly in the office.

Rural patients are older, poorer, more likely to have chronic diseases, and more often uninsured compared with urban residents. All of these factors contribute to the high rates of mental illness, especially depression and substance abuse, seen in small communities.<sup>37</sup>

The front line for rural mental health care is the primary care provider. Patients with mental illness often present first to their regular provider who needs to be able to diagnose and, at minimum, initiate therapy when needed. Psychiatric training for primary care providers, including physicians, is variable, so is individual comfort levels in treating mental illness.<sup>31</sup>

For many patients, care from their primary care provider is sufficient. However, more complicated cases are problematic, and referral options are limited. Rural mental health services are commonly provided by social workers, psychologists, educators, and clergy; it is rare to have a psychiatrist available in town.

The availability of mental health services is only part of the challenge of delivering high-quality mental health care in rural communities. Rural communities lack anonymity and the risk, for example, of parking their readily identified car outside of a mental health facility can make care unacceptable to many patients.

Many rural residents also come from traditions of self-reliance and exaggerated stigma related to mental illness and psychiatric care.

Some of the same qualities of rural living that create challenges for mental health care also offer opportunities. Close-knit communities with extended family can provide much needed comfort and reduce isolation for those suffering with mental illness. While many residents have an ethos of self-reliance, those living in small communities rally around neighbors, friends, and family in need. Religion plays a larger role in rural communities, adding clergy to the team of potential mental health providers.

One night T.T.'s mother called 911 after she found her lethargic at home carrying an empty bottle of Tylenol PM. Upon arrival at the ED, her acetaminophen level was high enough to require treatment. Once medically stable, she was involuntarily admitted to the state psychiatric facility 4 hours away, where she was diagnosed with bipolar disorder. She was started on a mood stabilizer by the treating psychiatrist. When no longer a threat to herself, she was discharged home with instructions to follow-up with her NP. She is followed up regularly by the NP and the local county mental health psychologist.

Since the 1960s, policymakers have been striving for mental health services to be better integrated into overall medical care. Nowhere is this more important than in rural communities. Incentives are needed for medical clinics and systems to hire mental health professionals and to site them side by side with the medical team. In the current environment, this is often financially impossible for many small offices. Building linkages with mental health services that allow for visiting mental health providers to work within clinics would be extremely valuable. Area health education centers that have typically focused on the primary care workforce are starting to attend to rural training for mental health providers as well.

Telemedicine offers tremendous promise in rural mental health. The Veterans Administration has been using this modality for psychiatric services for over 20 years. E-consults with rural providers as well as direct psychotherapy between patients and distant mental health professionals are used effectively in communities around the United States and internationally. The improvement of cellular technology holds promise for these modalities in many locations worldwide where traditional Internet services are not available.

## **CARE OF THE RURAL DENTAL PATIENT**

A 28-year-old man with tooth pain comes to see a dentist in a community of 4000 people. He has not seen a dentist since childhood and had tooth pain for several years but has not been able to afford care. He was seen in the local ED about a month ago and was noted to have an "abscessed tooth." The ED physician did a local injection for pain control and started him on antibiotics. He has diffuse decay with significant erosion among the right lower molars. He will need an extraction and possibly dentures.

There are proportionally fewer dentists and higher rates of dental caries in rural communities compared with urban towns. Over half of the rural counties in the United States are designated as Dental Health Professional Shortage Areas by the federal government.<sup>38</sup>

Rural residents are more likely to be without insurance coverage for dental care. Many Medicaid programs offer limited dental services, but only 25% of dentists in the United States accept Medicaid (ref). Medicaid patients are often more complex and might not be able to comply with instructions/prescriptions due to lack of education and other health issues. Although Medicaid patients are generally a more difficult, time-consuming, and expensive population to work with, dentists cite lack of reimbursement as the main reason they do not accept Medicaid.<sup>38</sup>

Despite the challenges, rural dentists report high professional satisfaction. Office space costs, employee salaries, and competition are all less in rural communities, while fees are generally comparable. Most rural dentists provide a full range of dental services and use modern equipment in quality facilities.

Remedies to fill the cavity of rural dentistry include multilevel approaches from public health to the dentist's chair. Increasing water fluoridation would be the most cost-effective solution, but rural communities rely on well water and smaller water systems that are less easily converted.<sup>39</sup> Furthermore, many rural residents are resistant to water fluoridation. Recruiting dental students from rural areas and developing educational partnerships to provide rural experiences for dental students could address some workforce needs. Following the lead of countries from Nepal to New Zealand, training midlevel dental practitioners to provide routine preventative care, fillings and simple extractions, has expanded access to dental care to 35,000 patients in remote rural areas of Alaska.

## CONCLUSION

The intimacy of caring for rural patients and their communities is among the most venerable and satisfying pillars of medicine. Caring for multiple generations of the same family, practicing to the widest scope of training, and having a direct and meaningful impact on the community are the norm rather than the exception for many rural providers. But now more than ever, rural communities are faced with numerous challenges that threaten access to quality health care. The ongoing success and improvement of services in small towns will continue to evolve and rely on regional and national government initiatives as well as the long-term partnership between the community and health-care professionals, clinics, and hospitals.

### CORE COMPETENCY

#### Important Elements of Social History for Rural Patients

How far will the patient need to travel to receive care, including subspecialty care, diagnostic testing, and treatment?

Does patient have adequate transportation?

Is there a pharmacy in town? How much travel is needed to get medications or can they be sent by mail? (Clinics may need to be able to provide several days of medications if needed urgently.)

Does patient have a reliable phone?

Does patient have a satisfactory living situation?

Is the patient isolated or connected to family or community?

Does patient have occupational risks? Recreational risks?

What resources might the patient need that are available in the community?

What resources might patient need that are outside of the community?

Are community resources acceptable to the patient?

Is the community so small that privacy concerns might increase patient's reluctance to buy from the local pharmacy or access local resources?

### KEY CONCEPTS

Rural populations are vulnerable.

There are multiple aspects of rural living that contribute to health in rural populations.

Provider maldistribution is a significant barrier achieving health equity in rural areas.

Health-care systems and government regulations play an important role in access to care in rural communities.

Rural patients present unique challenges and opportunities to health-care providers.

## DISCUSSION QUESTIONS

1. Among the benefits of rural practice, which do you think might be most relevant to health-care professional students and trainees as they are deciding on future careers?
2. Discuss the benefits of interprofessional training for rural health-care providers.
3. What challenges and opportunities can you identify to using the chronic illness care model and population-based interventions in rural practice?

## RESOURCES

National Rural Health Association—The NRHA provides leadership on rural issues through advocacy, communications, education, and research. <http://www.ruralhealthweb.org/>.

U.S. Department of Agriculture *Amber Waves*—Amber waves is a newsletter style publication highlighting the economics of rural living. <http://www.ers.usda.gov/amber-waves#.U2KIZse5Cxo>.



World Health Organization—WHO is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries, and monitoring and assessing health trends. <http://www.who.int/about/en/>.

Federal Office of Rural Health Policy. Provides detailed information on all aspects of rural health, federal and state programs, grants and research. <http://hrsa.gov/ruralhealth>.

National Association of Community Health Centers. <http://www.nachc.org>.

National Association of Rural Health Clinics. <http://www.narhc.org>.

RUPRI—Rural Policy Research Institute. Excellent site for all policy issues and information on current research. <http://www.rupri.org>.

Handbook of Rural Health Ethics: A Practical Guide for Professionals. Dartmouth Family and Community Medicine Department. <http://geiselmed.dartmouth.edu/cfm/resources/ethics/>.

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