

Graduate Medical Education Initiatives to Develop the Physician Workforce in Rural Wisconsin

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ABSTRACT

The physician shortage is an increasing concern across the nation. Wisconsin is seeing this shortage grow even more prominently in rural counties. In order to prepare a sufficient rural physician workforce, several state-funded programs are collaborating to monitor the number of rural graduate medical education (GME) opportunities available, assess the number of rural physicians needed to meaningfully reduce the shortage, and promote effective development and expansion of new and existing opportunities. From 2010 to 2017, there has been substantial growth in rural-focused undergraduate, graduate, and continuing medical education opportunities; by 2020, there will be 141 new rural GME positions through creating new and expanding existing residency and fellowship programs. Once residents and fellows graduate from their respective programs, it will be possible to measure to what degree rural program expansion may impact the number of physicians who choose to stay and practice in rural Wisconsin communities. The program initiatives in this report have demonstrated success in increasing residency and fellowship training opportunities with early outcomes indicating this strategy is effective in the recruitment and retention of physicians in rural Wisconsin.

INTRODUCTION

The shortage of rural physicians continues to increase across the nation,¹ and reports of rural hospital closures continue to rise.² Physician shortages and hospital closures are 2 leading factors that contribute to the limited access to health care services that patients experience in rural communities.³ Travel burden commonly experienced in rural areas has been associated with lower health care

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utilization,⁴ which may lead to an earlier onset of illness or disease and influence more aggressive treatment options when illness or disease is present.⁵ Aggressive treatments put patients at a higher risk of infections and mortality and also contribute to higher preventable costs in health care expenditures.⁶ This cycle demonstrates how the shortage of physicians impacts growing health risks observed in rural communities.

According to County Health Rankings & Roadmaps, 12 of the 17 unhealthiest counties (71%) in Wisconsin are both rural and in the northern region of the state. Top US performers have a ratio of 1 primary care provider (PCP) for every 1,030 people, whereas

one third of Wisconsin counties have only 1 PCP for a population of 2,000 or more. The majority of these counties (71%) are rural, with the lowest ratio of PCP to population being 1:20,150.⁷ An adequate supply of physicians is critical to improving access and reducing travel burden to health care services for patients living in rural areas.⁸

To address the rural physician shortage, the Wisconsin Council on Medical Education and Workforce (WCMEW), medical schools, and a number of graduate medical education (GME) programs have developed and expanded rural medical training programs. With both of Wisconsin's medical schools increasing their number of graduates and rural training opportunities, it is essential that residency programs also expand rural training options across the state to most effectively retain the graduates and relieve the maldistribution of physicians.⁹ Prior reports identify that 86% of residents from Wisconsin who attend both an in-state medical school and in-state residency program also will go on to practice medicine in the state.¹⁰

This review will outline the collaboration among Wisconsin's state-funded GME initiatives to strategically address the number, size, and location of residency programs to resolve the physician shortage and improve health outcomes in rural communities throughout the state.

Through this discussion, we will highlight the state's accomplishments related to increasing the supply of the rural physician workforce.

BACKGROUND

In a 2004 physician workforce report, the Wisconsin Hospital Association and Wisconsin Medical Society outlined a plan to forecast future demand for physicians and identify strategies to meet the need. To improve physician recruitment and retention, the group recommended increasing the number of students in medical school and recruiting students who are likely to practice in underserved parts of the state. One of the action steps to achieve this goal involved creating a school-within-a-school with a programmatic focus on underserved areas.¹¹ Studies have shown that medical schools that select students of rural origins are more likely to have graduates who go on to practice in rural areas.¹² It also has been shown that medical students with exposure to clinical rotations in rural communities are more likely to practice medicine in rural communities, especially if they continue their residency education at a rural medical center.¹³

Medical School Expansion

To address the front-end of the physician workforce development continuum, the University of Wisconsin School of Medicine and Public Health (UWSPH) and Medical College of Wisconsin (MCW) created new educational programs to graduate an increased number of medical students each year. Focused on rural physician workforce needs, the UWSPH Wisconsin Academy for Rural Medicine (WARM) program in Madison and 2 new MCW campuses in northeastern (Green Bay) and central (Wausau) Wisconsin select students who demonstrate rural origin and interest and provide medical training and curriculum that prepares students for rural practice. WARM, which began in 2007, matriculates 26 students each year to participate in a rural core curriculum along with rural clinical experiences at regional sites. MCW's Northeastern and Central campuses, which began in 2015 and 2016 respectively, matriculate 25 students each year.

Graduates from the WARM program who have completed their residency training are meeting the program goals with 89% practicing in the state. Of these physicians, 51% practice in rural areas and 35% have returned to their hometown to practice.¹⁴ The first class of students at MCW campuses will start their residency as early as 2018 and enter practice as early as 2021.

Rural GME Programs

As discussed in the physician workforce report by the WCMEW, expanding the capacity of both in-state medical schools and residency programs can lead to a greater supply of in-state physicians.¹⁰ Rural training track residency programs historically have found the majority (76%) of graduates enter rural practice;¹⁵ however, in 2010, Wisconsin had only 1 remaining family medicine rural training track and limited opportunities for other rural-intensive

residency training opportunities. Rural communities have a significant need for more primary care physicians, including family medicine, as well as general surgeons and psychiatrists.¹⁶ While family medicine physicians historically have provided the majority of maternity care in rural areas, there has been a steady decline in access to hospital-based obstetrical services in these areas.¹⁷ This creates an additional gap in obstetrical care in rural communities.

Goals

In the physician workforce report *100 New Physicians a Year: a Wisconsin Imperative*, the Wisconsin Hospital Association reiterated its recommendation to increase the number of medical school graduates (preferably by establishing new community-based campuses of our existing medical schools), and also proposed to increase the number of available GME positions, and address anticipated changes in care delivery by ensuring the educational and clinical infrastructures are in place.¹⁸

The Wisconsin Hospital Association projected a deficit of over 2,000 physicians by 2030, and additionally recommended an increase in the amount of state funding for GME and monitoring of GME program development to ensure sufficient opportunities to place Wisconsin's medical school graduates in in-state residency programs.¹⁸

OUTCOMES OF GME INITIATIVES

State Funding for Rural GME

In response to the WCMEW's recommendations, as well as efforts and advocacy among the Wisconsin Hospital Association, Wisconsin Medical Society, specialty organizations, and the Rural Wisconsin Health Cooperative (RWHC), the state legislature and governor established the Wisconsin Rural Physician Residency Assistance Program (Residency Assistance Program) in 2010 with funding to help develop the infrastructure, network, and processes to design and implement new rural GME programs. In 2013, an additional \$2.5 million in the state's biennial budget was provided for the Department of Health Services GME Initiative ("DHS Initiative") to target expansion of existing GME programs and further develop new programs. Each year, the Residency Assistance Program and DHS Initiative collectively distribute \$3.25 million in state-funded grants to assist rural hospitals and educational institutions in increasing rural GME programs, tracks, and rotations throughout the state. In 2017, ongoing legislative advocacy and demonstrated success resulted in funding increases for both the Residency Assistance Program and DHS Initiative.

Support Services for New Development

A key finding from early outreach activities was that interested hospitals and institutions commonly need additional support to manage accreditation requirements in order to develop new rural programs. Rather than providing grants to hire new staff at each site, the Residency Assistance Program and RWHC responded to the collective need through forming and funding a new entity named

the Wisconsin Collaborative for Rural GME (Collaborative). The Collaborative was created to address similar administrative needs that exist across the state, which includes providing accreditation assistance and consulting services at no cost to hospitals and educational institutions that are developing new rural GME programs. Their functions expanded to include hosting statewide meetings to serve a broader range of rural GME stakeholders, providing training opportunities for faculty and administrators, and offering a centralized online directory and interactive state map that displays new and existing rural GME programs.

Rural GME Grant Activities

The Residency Assistance Program and Collaborative strategically provide information and outreach for rural hospitals that are potential sites for developing GME. Through these activities, the programs observed that strong support from both administration and physicians is necessary to achieve successful GME infrastructure development. Once hospitals and institutions identify committed faculty and staff, they are encouraged to schedule an initial site assessment with the Collaborative and apply for a grant to further assess the feasibility of developing a sustainable new GME program or rotation.

As of 2017, 14 new program grants awarded by the Residency Assistance Program and/or DHS Initiative have helped to establish 31 new first-year positions for residents and fellows in rural GME programs. These numbers result from 2 new family medicine rural training track residency programs and new rural tracks in or alongside urban family medicine, general surgery, psychiatry, and obstetrics and gynecology residency programs. Figure 1 demonstrates the growth in rural residency capacity for these specialties since 2010. In 2020, there will be a total of 208 residents and fellows in rural programs, compared to a total of 67 residents and fellows in rural programs in 2010. These 141 new positions in rural programs will translate to annually graduating 72 physicians, compared to the 19 rural GME program graduates in 2010 (see Table 1).

As shown in Table 2, funding from the Residency Assistance Program and DHS Initiative will have supported 183 (88%) of the 208 total GME positions in Wisconsin's rural programs in 2020. State assistance will contribute to training 88 of the 90 residents in rural family medicine, all 32 residents in rural psychiatry, 8 of the 23 residents in rural general surgery, all 4 residents in rural obstetrics and gynecology, 45 of the 53 residents in other rural primary care specialties like internal medicine and pediatrics, and all 6 of the rural fellowship positions. Figure 2 shows the number of open positions for medical school graduates to enter rural residency programs each year. These programs are considered a high priority for rural health care needs and designed to provide residents with significant clinical experiences in delivering health care specifically for Wisconsin's rural populations.

Table 1. Summary of Positions in Wisconsin Graduate Medical Education Programs With Rural Emphasis

Residency Program	2010		2013		2017		2020	
	R1	Total	R1	Total	R1	Total	R1	Total
Family Medicine	5	14	4	14	22	41	35	90
Psychiatry	0	0	0	0	8	11	8	32
General Surgery	2	15	3	15	5	19	5	23
Obstetrics/Gynecology	0	0	0	0	1	1	1	4
Other Primary Care	12	38	16	48	17	53	17	53
Total	19	67	23	77	53	128	66	202
Fellowships	0	0	0	0	2	2	6	6
Grand Total	19	67	23	77	55	128	72	208

Abbreviation: R1, first-year resident.

Table 2. Number of Rural Graduate Medical Education Positions That Received State Funding, 2020

Program	2020	
	Positions With Funding	Total Positions
Family Medicine	88	90
Psychiatry	32	32
General Surgery	8	23
Obstetrics/Gynecology	4	4
Other Primary Care	45	53
Total	177	202
Fellowships	6	6
Total	183	208

GME distribution

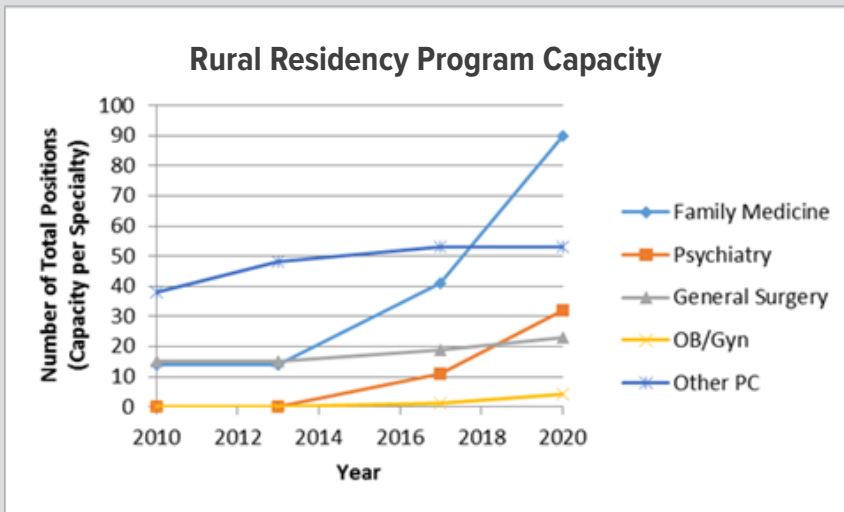
In addition to increasing the number of resident physicians, there is an emphasis on the distribution of graduating resident physicians. Based on the implications that adequate rural training increases the likelihood of physicians to practice in rural communities,^{13,15} and physicians tend to enter practice in areas near the site of their residency training,¹⁹ there have been intentional efforts to develop training opportunities in areas of Wisconsin with the greatest shortages. The growing awareness of the health disparities in northern Wisconsin put a special focus on expanding GME in this region. Targeted statewide forums have resulted in the early formation of 2 new family medicine residency programs that primarily serve the Northwest region, and there is strong interest in creating a GME consortium that will specifically sponsor GME expansion across the northern part of the state.

DISCUSSION

Successes

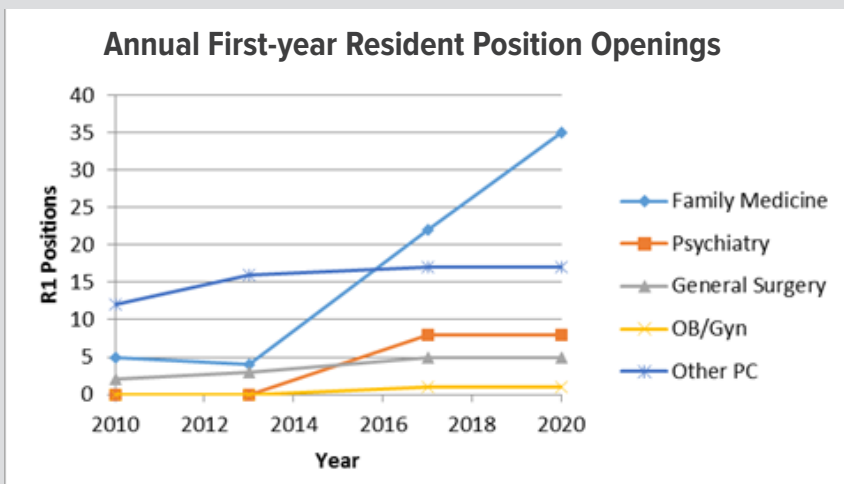
The WCMEW recommendations supported the creation of the UWSMPH WARM program and 2 new MCW regional medical school campuses, funding for the Residency Assistance Program and DHS Initiative, and assistance to develop rural GME programs distributed throughout rural and underserved regions. Rural physician workforce stakeholders continue to expand

Figure 1. Change in Capacity of Rural Residency Programs From 2010 to 2020



*Other Primary Care (PC) includes internal medicine, pediatrics and med-peds.

Figure 2. Available R1 Positions in Rural Residency Programs From 2010 to 2020



*Other Primary Care (PC) includes internal medicine, pediatrics and med-peds.

Abbreviation: R1, first-year resident.

statewide GME grant programs, improve health professional education infrastructure, and implement strategies that are likely to influence physician recruitment and retention.

Statewide collaboration has influenced the development of a number of GME opportunities in rural settings. Based on the evidence pertaining to rural training track outcomes and in-state physician recruitment, this development is expected to result in a significant increase in the number of physicians practicing in rural Wisconsin.²⁰ There has been growth in rural opportunities along the continuum of educational opportunities, ranging from rotations in smaller rural communities where the infrastructure would not support a full residency, to increasing the size of GME programs with a rural emphasis, to creating new GME programs in a rural setting.

Wisconsin is among other states that have prioritized GME expansion to address the rural physician shortage. Crandall et

al identified 4 conceptual models used in recruitment and retention: affinity, indenture, economic, and practice characteristics.²¹ In Wisconsin, the medical school initiatives and GME initiatives incorporate aspects of the affinity model through the selection process of students and residents and in the educational experiences in rural settings. The state Loan Forgiveness Program, administered through the Wisconsin Office of Rural Health, is an example of the indenture model where payments for service in underserved rural regions will reimburse education loans. This indenture model can complement the affinity model. In Georgia, the state is increasing the number of medical students being trained to address the rural physician shortages, and developing residency programs in areas of physician shortages to address physician maldistribution. The expansion of available medical school positions in the state combined with state funding to start new GME programs are similar to the Wisconsin initiatives reported here.⁹

With the development of new residency programs, there is the opportunity to enhance rural recruitment and retention through the “practice characteristics model,” in which many of the initiatives target primary care. After the passage of the Affordable Care Act of 2010, the Agency for Healthcare Research and Quality created a national Primary Care Extension Program (Extension Program)

to deploy local community-based extension agents and “assist primary care providers to implement a patient-centered medical home to improve the accessibility, quality, and efficiency of primary care services.” New Mexico and Colorado have combined funding from governmental and private sources, foundations, and state agencies to implement this Extension Program model to successfully improve quality of care while reducing utilization.²² These changes can make rural practice more attractive and further aid recruitment and retention.

Primary care physicians account for 37% of the total physician shortage across the United States and general surgeons are the next highest in demand, comprising 33% of the shortage.²³ The inadequate supply of general surgeons is especially threatening in rural areas, because of the critical role that general surgeons play in the health care workforce. If general surgeons retire or leave small hospitals and are not replaced, small hospitals are more likely to

close.²⁴ Hospital closures especially impact access to emergency care, and elderly and low-income individuals are more likely to be affected by challenges and thus delay needed care.²⁵ Both of Wisconsin's medical schools are addressing this issue by starting new rural tracks within their general surgery residency programs. With support from the Residency Assistance Program and DHS Initiative, the UW General Surgery Residency successfully matched its first rural resident in 2015. MCW General Surgery Residency also received funding from the DHS Initiative and successfully matched its first rural resident in 2017. Wisconsin is 1 of 9 states to offer a rural track for general surgeons.²⁶

Rural psychiatry has turned into a widespread focus as the mental health needs of our nation have become increasingly evident in recent years. Not only have youth suicide rates been found to be disproportionately high in rural areas, nearly doubling those in urban areas,²⁷ but the opioid epidemic has also become the number 1 cause of accidental deaths in Americans, with the largest increases in opioid mortality and injury being reported in heavily rural states like Kentucky, West Virginia, Alaska, and Oklahoma.²⁸ The Wisconsin Office of Rural Health compiled data from the Health Resources and Services Administration and identified that the vast majority of the state is experiencing population-based mental health professional shortage areas.²⁹ Ng, Camacho, and Dimsdale found that "challenges particular to rural psychiatry include patient confidentiality and therapeutic boundary issues, overlapping relationships, cultural and ethical demands, lack of subspecialty support, professional isolation, absence of academic collaboration, and difficulties in recruiting psychiatrists."³⁰

Through funding from the DHS Initiative and Rural Assistance Program, the UW Psychiatry Residency developed a public health track designed to provide 1 resident per year with a stronger knowledge base of the diverse mental health needs across the state. The program has found an unprecedented level of interest in rural mental health care among its residents and aims to better prepare these residents through offering clinical experiences and educational opportunities, including community-based treatment programs, telemedicine technology, and rural rotations that will address the unique issues facing individuals with mental illness in rural areas. In addition, and again with joint funding, MCW developed 2 new rural residency programs alongside the regional medical campuses in central and northeastern Wisconsin to recruit graduates of the MCW Central and Northeastern Wisconsin medical school programs. Both programs are community-based with required rotations occurring in a number of rural hospitals and other rural facilities. The MCW Central and Northeastern Wisconsin Psychiatry Residency programs recruited their first classes in July 2017; Central with 3 residents and Northeastern with 4 residents per year. The 4-year residencies will graduate their first class of residents, specifically trained to provide treatment in rural communities, in 2021 and together advance 7 new board-eligible psychiatrists each year.

While family physicians continue to be trained in maternity care, the proportion of family physicians providing maternity care has been declining for more than a decade.³¹ Obstetrician-gynecologists provide advanced obstetrical care and treat severe complications that might be referred out by family physicians but are less likely to be located in rural areas.³² Across the United States, the decreasing hospital-based obstetric services in rural counties and longer travel distances for patients are resulting in significant increases in out-of-hospital births and births in hospitals without obstetric services.³³ In response to these issues, the UW Obstetrics and Gynecology (Ob-Gyn) Residency received support from the Residency Assistance Program and started the nation's first rural track for Ob-Gyn residents. The new program's aim is to maintain the infrastructure and workforce for obstetric services and improve access to safe maternity care in Wisconsin's rural communities.

Challenges

The opportunity to develop GME rotations in a rural setting was met with a great deal of enthusiasm, but not every site was successful in implementing the rotations. Active participation and support by both the administration and practicing physicians was critical in order to be successful. Early observations showed that when only 1 segment was engaged, the efforts languished and inevitably failed. Now a suggested prerequisite to rotation development is to identify a site's leaders and supporters.

Key Learnings

Early on, strategies to attract interest in GME from hospitals and clinics were deployed addressing challenges noted by others in expanding GME.⁹ In 1 community where there had been a long-standing engagement in medical student education, there was concern about participating in GME where the residents would need to assume an active role in patient management. The decision was made to start a fellowship in hospitalist medicine and emergency medicine. Embarking on GME programming with board-certified learners resulted in less resistance among administrators and physicians to participate in the continuing education of these more advanced learners. In this case, a successful fellowship curriculum along with faculty experience facilitated more organizational participation in educational efforts and soon garnered enough interest and commitment among physicians to develop a traditional rural family medicine residency training track. As organizational leaders saw resident retention in regions where they trained and learned of improved physician retention because of the presence of a residency program, other organizations became more active in residency rotations and GME participation.

The achievements in Wisconsin result from a range of efforts, including gubernatorial support; legislative advocacy; community, faculty, and administrative development; and funding support for feasibility exploration and program implementation. The stakeholders outlined in this review evolved in a cooperative environment and have matured with

the understanding that success is a function of effective collaboration.

Intentional collaborative effort is a key factor in dealing with the legislative variations involving the Residency Assistance Program and DHS Initiative, where there are slight differences in funding support eligibility. For example, funding eligibility for either program can differ based on the definition of rural, in terms of where the training sites are located, as well as the type of GME specialty under which the resident is training. Organizations interested in implementing new GME activities benefit from statewide program collaboration, as they receive efficient guidance to appropriate funding sources and outreach support that best fits their planned activities. In a number of situations, communication and collaboration between the Residency Assistance Program and DHS Initiative have facilitated effective sequential funding from both programs, leading to successful development and implementation of new rural GME opportunities.

When new rural GME programs, tracks, and rotations were fully implemented, some organizations experienced concerns around long-term sustainability due to funding availability. In most cases, health systems prioritize GME in their long-term strategy to address workforce shortages and include the financial investment in their core recruitment and retention expenses. However, as the funding of health care faces potential challenges, systems may find it more challenging to continue support for all operations. This is bringing more attention to statewide and national discussions surrounding nationwide GME reform.

In this report, there are limitations in assessing the outcomes. With many different communities, health systems, GME programs, hospitals, and clinics involved, the collection of data is more complicated than initially anticipated. Historically, many programs and GME sites were not expected to collect or retain data in a retrievable format to allow for historical comparisons. GME is a complicated process and the differing definitions of rural programs, tracks, and rotations can hinder meaningful comparisons across time and geography.

CONCLUSION

Ensuring an adequate rural physician workforce has been a challenge for decades and continues today. Initiatives providing educational opportunities in rural settings during medical school and residency are among the strategies to address these shortages. The initiatives reported here demonstrate success in increasing the opportunities for GME in rural Wisconsin with early outcomes indicating this strategy is effective in the recruitment and retention of physicians in rural hospitals and clinics. This success is the result of the efforts of many partners across a continuum, including advocacy and development of community, faculty, and administration support to actual support and implementation of GME

activities. Collaborative partners working toward a common goal are paramount in overcoming obstacles to increase the number of practicing physicians in rural communities.

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