

## The Role of Telemedicine in Rural Specialty Care: Priorities and Recommendations From Rural Primary Care Physicians

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### ABSTRACT

**Introduction.** The study goal was to understand telemedicine's role in improving access to rural specialty care. Other outcomes included assessing specialty availability and frequency of referrals at rural sites.

**Methods.** This mixed methods study included surveys and semi-structured interviews of rural primary care physicians (PCPs). Survey data were analyzed with summary statistics and cross-tabulations. Interview transcripts were inductively thematically analyzed.

**Results.** Of the 19 PCPs who completed the survey, 37% agreed/strongly agreed current telemedicine practices connected patients to better specialty care; 90% agreed/strongly agreed it had such potential. Interviews revealed telemedicine could improve care when local specialists were unavailable and provided the most benefit in acute care settings or specialist follow-ups. Most survey respondents reported outreach specialists were highly effective in addressing rural specialty care needs. Respondents reported cardiology, general surgery, orthopedic surgery, ENT/otolaryngology, and dermatology as the most frequently referred-to specialties. In-person neurology, gastroenterology, and dermatology were unavailable in many communities. Respondents identified psychiatry as a high priority for telemedicine and discussed clinic-to-clinic visits to optimize telemedicine use.

**Conclusions.** The perceived discrepancy between the current and potential roles of telemedicine in rural specialty care suggests that telemedicine may not fully align with the needs of rural patients and could be optimized for rural practice settings. While local, in-person access to specialists remains a priority, telemedicine can reduce patient burdens and improve care when in-person specialists are unavailable. Telemedicine proponents can identify high-priority areas for implementation through quantitative assessment of specialty care utilization and access as reported by PCPs. *Kans J Med* 2024;17:6-10

### INTRODUCTION

Telemedicine may be a way to bring specialty care and expertise closer to rural Americans while improving care continuity, costs, and interprofessional communication.<sup>1,2</sup> Telemedicine expansion accelerated during the COVID-19 pandemic;<sup>3,4</sup> however, rural providers face unique barriers to implementation, including policy regulations, financial and administrative support, and fewer participating specialists.<sup>5</sup> Rural utilization, perceptions, and telemedicine-related obstacles likely have changed amid a progressive technological landscape, necessitating further research.<sup>6</sup>

While telemedicine interventions have aimed to address *perceived*

needs, there is insufficient research assessing the *actual* specialty care needs of rural patients and providers, and how telemedicine can address them. Without a comprehensive understanding of rural needs, rapid telemedicine development may bypass populations it aims to serve and disrupt, rather than enhance, rural primary care practices.

### METHODS

This cross-sectional study included primary care physicians (PCPs) practicing in rural communities and participating in the University of Kansas School of Medicine's Summer Training Option in Rural Medicine (STORM) program. The research team collected data via survey and semi-structured interviews. The survey included questions about specialty care availability, frequency of specialty referrals, the perceived value of telemedicine in providing specialty care, and communication between PCPs and specialists. We conducted statistical analyses using SPSS; cross-tabulations described the relationship between specialty availability and referral frequency. Graphical representations using weighted averages show results of the cross-tabulations (Figure 1).

The research team based the semi-structured interview guide on questions from a prior study about optimizing telemedicine strategies and adapted for rural PCPs<sup>7</sup> (See Appendix 1 for the complete interview guide; appendix is only available online at [journals.ku.edu/kjm](http://journals.ku.edu/kjm)). Research assistants conducted interviews in-person or via Zoom, recorded them, and professionals transcribed them verbatim. Braun and Clarke's guidelines informed inductive data coding and theme generation.<sup>8</sup> Two authors (FH, AH) coded responses independently, resolving conflicts by consensus. We used this framework to achieve the primary study goal: understanding the optimal role of telemedicine in rural specialty care from the perspective of PCPs. The University of Kansas Medical Center (KUMC) Institutional Review Board approved this study.

### RESULTS

Nineteen PCPs responded to the survey, and 20 participants completed interviews. Respondents' average county populations was 1,991 to 38,972 people (mean: 15,176). Most survey respondents were male (63.2%), with an average practice duration of 7.0 years and an average of 5.8 years in their current community. All respondents reported practicing in an ambulatory setting, with 73.7% also inpatient, 63.2% emergency, 15.8% school-based, 21.1% intensive care unit, 84.2% long-term care facility, and 10.5% in other settings. More than half (57.9%) provided some obstetrical care, with 72.7% of those performing vaginal deliveries and 63.6% offering surgical obstetrics. Proximity to a tertiary care center ranged from 15 minutes to over 3 hours. See Table 1 for demographics.

**Table 1. Demographic information.**

<b>Gender</b>	Male	12	63.2%
	Female	6	31.6%
	Prefer not to say	1	5.3%
		<b>Mean</b>	<b>StDev</b>
<b>Years as Practicing Physician</b>		7.0	0.9
<b>Years Practicing in a Rural Community</b>		7.1	1.0
<b>Years Practicing in Current Community</b>		5.8	0.8
<b>Number of Other Primary Care Providers</b>		3.4	0.4
<b>Number of Midlevel Providers</b>		3.9	0.6
<b>County Size (2020 U.S. Census)</b>		16040.6	11973.5
<b>Rural Code (RUCC 2013)</b>		6.6	1.7
		<b>N</b>	<b>%</b>
<b>Practice Settings<sup>a</sup></b>	Ambulatory	19	100.0%
	In-patient	14	73.7%
	Emergency	12	63.2%
	School-based	3	15.8%
	ICU	4	21.1%
	Long-term care facility	16	84.2%
	Other practice setting <sup>b</sup>	2	10.5%
<b>Obstetrical Care Provided</b>	No	8	42.1%
	Yes	11	57.9%
<b>Obstetric Services<sup>*</sup></b>	Prenatal care	10	90.9%
	Vaginal delivery	8	72.7%
	Cesarean section	7	63.6%
	Postnatal care	10	90.9%
	Other obstetric services <sup>c</sup>	1	9.1%
<b>Driving Time to Nearest Tertiary Care Center</b>	15 to 30 minutes	1	5.6%
	30 to 60 minutes	6	33.3%
	1 to 2 hours	5	27.8%
	2 to 3 hours	5	27.8%
	3+ hours	1	5.6%

<sup>a</sup> Responses for these topics were not mutually exclusive.

<sup>b</sup> Other practice settings include hospice and home visits.

<sup>c</sup> Other OB services were not specified.

The team assessed specialist availability and utilization using participants' reports of availability and frequency of referral. The specialties with the highest referral frequencies were cardiology (68.4% frequently referred to, 21.1% very frequently), general surgery (68.4% frequently, 21.1% very), and orthopedic surgery (57.9% frequently, 15.8% very). Critical care (26.3% not at all referred to, 57.9% infrequently) and anesthesiology (26.3% not at all, 52.6% infrequently) had the lowest referral frequencies. Neurology, gastroenterology, and dermatology were the least available specialties (36.8%, 36.8%, and 31.6% reported as not available in the community, respectively), despite frequent referrals (Figure 1). Of surveyed PCPs, 37% agreed or strongly agreed that telemedicine helped connect their patients to better specialty care. Ninety percent agreed or strongly agreed that telemedicine had the potential to connect their patients to better specialty care. Ninety-five percent agreed rural provider input was necessary for telemedicine to serve rural patients effectively (See Appendix 2 for additional results; appendix is only available online at [journals.ku.edu/kjm](http://journals.ku.edu/kjm)).

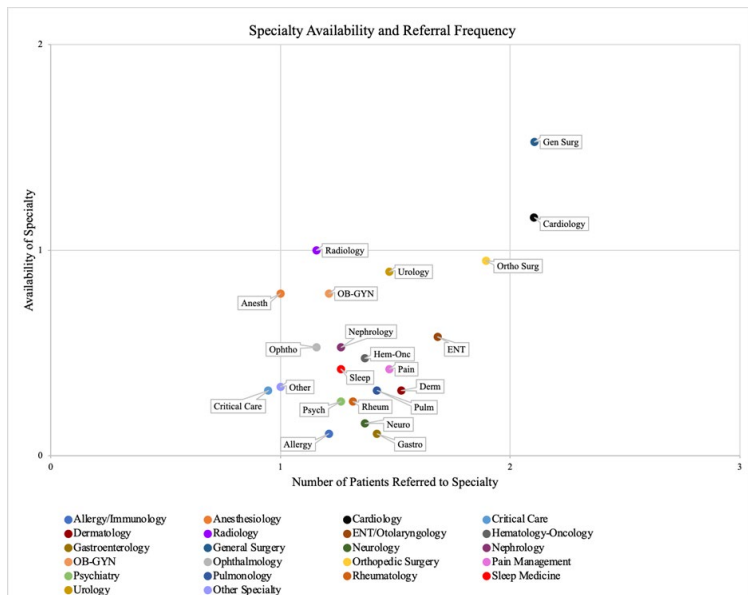


Figure 1. Specialty availability and referral frequency.

**Key:**  
 Frequency of Referrals to Specialty (x-axis)

- 0 = not at all (0)
- 1 = infrequently (1-20 patients/year)
- 2 = frequently (20-40 patients/year)
- 3 = very frequently (50+ patients/year)

Availability of Specialty (y-axis)

- 0 = not available in community
- 1 = commute to community
- 2 = practice primarily in community

Twenty eligible physicians participated in interviews. Interview time totaled 7.5 hours. Individual interviews averaged 22 minutes. Key themes included benefits, concerns, and other priorities related to telemedicine. Primary care physicians highlighted improved access to care and reduced travel burden for patients. They also mentioned increased support for rural providers, with the potential for a positive impact on provider recruitment and retention. Concerns included limitations of physical exams, perceived inferiority to in-person visits, reimbursement and billing complications, access to telemedicine post-pandemic, fear of telemedicine replacing outreach specialists, and patient barriers to telemedicine (e.g., internet access).

The research team subdivided priorities for the ideal use of telemedicine into general framework, visit types, and specific specialties (Table 2). Respondents identified two priorities for specialty telemedicine: 1) it should complement rather than replace in-person visits, and 2) clinic-to-clinic visits offer an ideal setup. Visit types deemed best suited for telemedicine included acute/urgent care settings and follow-up visits with specialists. Respondents highlighted psychiatry as a specific specialty in which telemedicine could have a substantial positive impact. Other high-priority specialties varied based on community needs.

Table 2. Priorities for use of telemedicine.

Theme	Priority	Selected Quotes
General framework	Secondary to in-person visits in the community	"...almost always an in-person visit is the first choice. But if an in-person visit is not going to happen because of location or cost or transportation..., then a telemedicine visit can be super helpful."
	Clinic-to-clinic visits	"[I]f I was going to design an ideal world telemedicine program, I think it would be an actual physical office that, like in the hospital or in our clinic, that the patient would come to, and all of the technology was set up and there was a nurse there that could take their vitals and then get the computer hooked up and then draw their labs if the specialist ordered labs..."
Visit types	Acute/urgent care	"In the [ER] we have telemedicine capabilities for neurology...for doing stroke assessments and things like that. Those are high priority interventions..."
	Follow-up visits	"[I]f the patient is already established with the specialist. For example, if the patient is already following that particular cardiologist, if they're just doing a follow-up for a certain condition..."
Specific specialties	Psychiatry	"I think psychiatry would be one that is really helpful..."
	Other (based on community needs)	"Neurology, rheumatology, gastroenterology, and dermatology are probably the big ones down here that we lack that could benefit."

**DISCUSSION**

Our assessment revealed that telemedicine can facilitate access to specialty care by overcoming patient barriers and minimizing provider isolation. However, those implementing telemedicine should optimize its delivery to address rural-specific limitations. Telemedicine may be considered an adjunctive tool to high-quality, in-person care. Lastly, it is possible to identify specific specialties in which telemedicine interventions may have the greatest impact.

Our data underscored a significant disconnect: only 37.0% of providers agreed that telemedicine currently helps connect their patients to better specialty care, while 90.0% agreed that it has the potential to do so. Overall, our findings echo similar concerns raised in previous studies. Namely, telemedicine does not replace an on-site physician, some fear it may disincentivize commuting specialists, and rural patients face limitations in accessing telemedicine, such as limited internet access.<sup>19,10</sup> Unexpectedly, our data suggested telemedicine could potentially improve rural provider recruitment and retention by reducing feelings of professional isolation. This is interesting given a previous study also found telemedicine to improve recruitment and retention, specifically among hospitals using telemedicine in the ED.<sup>11</sup>

The future availability of local and outreach specialists is uncertain, and rural workforce shortages may have an impact.<sup>12,13</sup> Acute/urgent settings and follow-up visits could be initial areas of focus for telemedicine implementation in communities where such services are not available.

High-priority specialty areas for telemedicine implementation could be based on perceived need (e.g., psychiatry) and a quantitative assessment of frequently utilized (e.g., cardiology, surgery) and difficult to access (e.g., neurology, gastroenterology, dermatology) specialties. The perceived need for psychiatric services is unsurprising given the ever-increasing disparity in mental health services, particularly in rural areas.<sup>14</sup> Psychiatric e-consultations and telehealth visits may already be implemented in several rural primary care settings. A variety of specialties are increasingly encouraging e-consultations for collaboration with rural provider collaborations, referral triage, and decreasing appointment wait times.<sup>15-17</sup> The specialties identified in our study as high-priority may not be generalizable to all rural communities. There are limitations to our utilization of specialist availability and referral frequency as proxies for community need. The impact of availability on referral frequency is unclear; less available specialists may be inherently less referred to. More precise individual community-based needs assessments would be appropriate.

Finally, approaches such as clinic-to-clinic visits, also called facilitated, synchronous visits, may be a strategy to overcome patient barriers and optimize telemedicine use. One study showed telemedicine visits conducted primarily as clinic-to-clinic visits had equivalent outcomes to in-person office visits for endocrinology patients.<sup>18</sup> The Study to Promote Innovation in Rural Integrated Telepsychiatry (SPIRIT) trial demonstrated that clinic-to-clinic psychiatry visits improved outcomes

for patients in rural and underserved areas.<sup>19</sup> This is encouraging given our study identified psychiatry as a priority for telemedicine. Waibel, et. al.<sup>15</sup> reported significant patient cost savings related to travel and time off work with the use of facilitated, synchronous specialist visits. These studies support telemedicine as an effective tool to improve access to specialty care, especially when integrating facilitated, synchronous and asynchronous models.

This study had several limitations. Its sample consisted of rural Kansas physicians involved in medical education. Therefore, our conclusions may not be generalizable to all rural physicians. More patient-centered study designs would more accurately reflect patient telemedicine perspectives. Our sample size was appropriate for qualitative work, as we reached code saturation.<sup>20</sup> Our sample was also relatively homogenous, a factor indicating appropriateness of a smaller sample size.<sup>21</sup> However, our small survey sample size limited analytical power. A more comprehensive study could better assess the value of telemedicine for rural specialty care.

**CONCLUSIONS**

Our findings suggest that telemedicine may not fully align with the specific needs of rural areas and should be optimized to address the limitations of rural practice. While local access to specialists is preferred, most rural providers consider telemedicine fundamental in facilitating access to specialty care. It is most useful in acute settings where immediate specialist input could improve clinical outcomes and in follow-up visits that would otherwise burden rural patients. Specific areas of priority for telemedicine intervention include high-need specialties such as psychiatry, cardiology, and surgery, as well as difficult-to-access specialties such as neurology, gastroenterology, and dermatology. Further research is needed on clinical outcomes in specialty-specific telemedicine interventions, the effectiveness of clinic-to-clinic visits, and telemedicine's impact on the rural physician workforce.

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