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**Alternative Staffing Models to Improve Care for Complex Patients in
their Homes and other Settings: Early Findings from the Transforming
Complex Care Initiative**

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Executive summary

Medically and socially complex patients account for a disproportionate amount of healthcare spending, which has created a need for improved approaches to care management for these patients. This study analyzes three complex care programs in South Carolina, Virginia, and Wisconsin that use non-traditional workforce to extend the reach of their clinics to better engage complex patients in their homes, at medical appointments, and other community locations. The study is based on semi-structured interviews with key members of each complex care team supplemented with available quantitative data collected by the sites. All three programs focus on patient-centeredness, social determinants of health, personal barriers to health and wellbeing, and patients' self-efficacy. The most salient differences are characteristics and needs of the targeted populations; availability of resources (e.g., medical supplies social services); and the state health policy environment, which greatly influences the resources available to each program. While not sufficient for rigorous program evaluation, the quantitative data provide some early indications of how these programs may have influenced various medical and social indicators.

The study concludes with a discussion of how the experiences from the three sites can be used by providers and health systems considering the use of alternative staffing models to improve care for complex patients. Key considerations include the breadth of patient enrollment criteria, comprehensiveness of clinical and social support services, flow of information between home care and clinic care, and approaches to facilitating trust between patients and home-visit staff. These considerations must be made in the context of local patient needs, health system resources, and emerging health policy reforms.

Background

Improving care for medically and socially complex patients is essential for moderating healthcare spending growth and promoting population health.¹⁻³ A major challenge is that each complex patient faces a unique combination of medical, behavioral health, and social needs. As a result, healthcare providers seeking to improve complex care must have the staffing and capability to individualize patient care plans along these dimensions simultaneously. However, traditional health care professionals often are not well-equipped to address these needs.

This study compares three complex care programs, supported by the Transforming Complex Care (TCC) initiative, that deploy staff within their complex care teams to work as an extension of their respective clinics by meeting with patients in their homes, at medical appointments, or at other community locations.⁴ The analysis below compares the three models and outlines implications for other health systems considering the use of clinic extension staff to improve outcomes for complex patients.

Study Sites

AccessHealth Spartanburg

The first study site is AccessHealth Spartanburg (AHS), a not-for-profit organization in Spartanburg, South Carolina, affiliated with the Spartanburg Regional Healthcare System. Its mission is to provide care coordination, health system navigation, and connection to social services to uninsured residents of Spartanburg County with income at or below 150% of the Federal Poverty Level. South Carolina did not expand Medicaid under the Affordable Care Act (ACA). But in 2013, the legislature added a Proviso to the state budget, called the Healthy Outcomes Program (HOP), which was designed to reduce uncompensated hospital care. The HOP is a program that focuses on coordinating care for chronically ill uninsured individuals who are high users of hospital emergency department (ED) and inpatient services. Hospitals agreeing to enroll their most expensive uninsured patients in HOP could receive an increase in their Medicaid reimbursement rate of up to 2.5%, while those that did not participate could see a reduction in their disproportionate share hospital payments.⁵ In the implementation of its local HOP, called HOP-Spartanburg (HOPS), AHS coordinates with multiple health and social service agencies and employs three nurses and six community health workers (CHWs). When enrolling patients into HOPS, AHS uses a risk screening tool that it developed to classify patients into low, moderate, and high-risk categories for medical and social issues. Between July 2016 and January 2017, HOPS worked with 256 patients.

Virginia Commonwealth University Health System

The second site is Virginia Commonwealth University Health System (VCUHS), which developed the TakeCCare (Complex Care Assisting and Reviewing Education) Program for complex patients in Richmond, Virginia. To be eligible for the program, individuals must be uninsured, have income below the federal poverty level, reside in Richmond's East End, and have 1 or more hospitalizations and/or 3 or more emergency department visits within a six-month period. Individuals who are active substance users or who present safety concerns for the staff are excluded from the program. TakeCCare includes two medical outreach workers

(MOWs) who work with patients outside of the clinic setting. Between August 2016 and July 2017, the TakeCCare program worked with 59 patients.

ThedaCare

The third site is ThedaCare (TC), which is a not-for-profit Wisconsin-based health system that hired two community paramedics (CPs) to work with patients outside of the clinic setting. Eligibility for referral to the CPs is based on hospital or ED utilization, a list of clinical concerns with emphasis on diabetes management, or providers' "clinical intuition". Between January and August 2017, they worked with 56 patients.

Methods

The study is based primarily on semi-structured in-person interviews with members of the complex care team at each site. Interviews were conducted with five individuals at AHS in March 2018, four individuals at VCUHS in July 2017, and eight individuals at TC in August 2017. Interviewees were recruited to obtain a broad representation of responsibilities and patient interactions on each care team. At each site, the interviews included two clinic extension staff members, their supervisors, and other members of the complex care teams (e.g., physicians, advanced practice nurses). All interviews were recorded and transcribed. Two researchers analyzed the transcripts independently to derive major themes.

Information gained from the interviews is supplemented by early quantitative data collected at each site. These data represent what the sites were able to produce from their internal medical record systems and patient surveys at the time of our analysis. These data were often in raw and preliminary format. The type of data available varied across the sites depending on their focus and stage of program development. As a result, the data do not support rigorous quantitative evaluation of program outcomes. Rather, the data add additional context to the qualitative information, provide a description of patient populations, and in some cases, suggest early program progress.

Findings

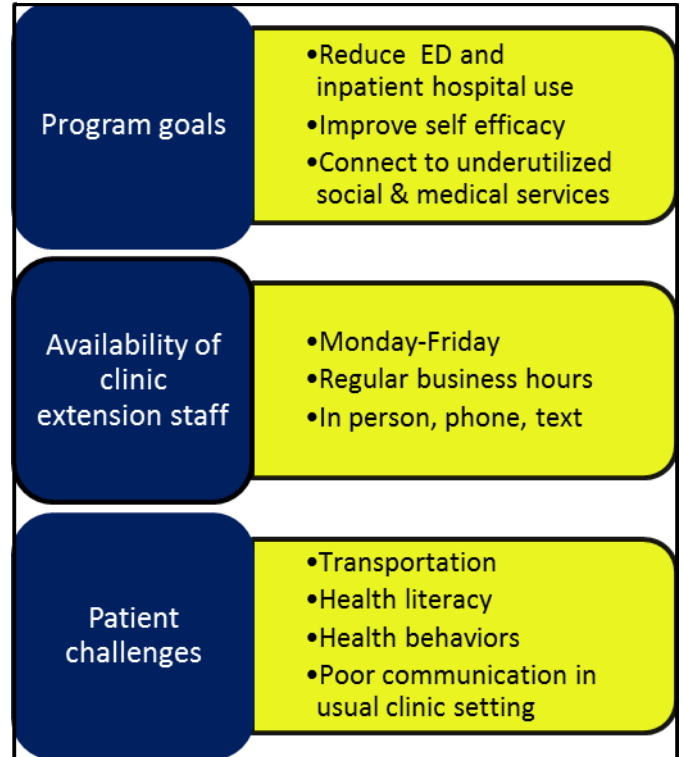
Organization of Complex Care Programs

The three programs share a number of common characteristics (Figure 1). These include similar program goals, defined hours and modes of communication between patients and clinic extension staff, and challenges faced by patients. The three programs, however, differ in many other ways, which reflect tradeoffs between resource availability and intensity of services offered. They also reflect local differences in the most common population health problems, where the sites felt they could have the greatest chance of success, and the scale at which the sites were interested in starting their programs.

VCUHS has the narrowest enrollment criteria, affording the team considerable ability to anticipate patients' acuity levels. AHS has the broadest enrollment criteria with no patient exclusions beyond serving the low-income uninsured. TC lies in the middle with a combination of metric-based enrollment criteria with room for "clinical intuition" in referring patients to CPs. All three programs will disenroll patients due to lack of engagement, although some patients may return later when they are ready to engage.

Both VCUHS and TC emphasize the time-limited nature of their programs and the goal of helping patients self-manage their conditions. As expressed by a TC representative, the team would underscore to patients from the outset that this is not a long-term service. Still, at both sites, there is some flexibility around the specific time period and graduation criteria, as patients can remain enrolled in the program for a longer time period based on their medical and social needs. In contrast, AHS has an open-ended time commitment to their patients, reflecting their mission and the nature of their clients' situations. Clients graduate when they obtain insurance coverage or disability assistance. Some patients, however, may never be in a position to graduate if they are undocumented or do not have the required payroll tax history to qualify for Medicare at age 65.

Figure 1: Common Characteristics of the Three Complex Care Programs



Early Data

The three sites have collected and assembled different kinds of kinds of quantitative data in the early stages of their TCC activities (Table 1). During these times, each site provided services to a slightly different mix of patients. All patients at AHS were uninsured and most were under age 55. At TC, most patients were ages 55 and over and Medicare was the most common coverage. VCUHS served a more diverse mix of patients by age and insurance coverage.

Table 1: Patient Characteristics at the Three Sites

	AHS	VCUHS	TC
Enrollment period	July 2016-January 2017	August 2016-July 2017	January 2017-August 2017
Total enrolled	256	59	56
Female	50%	51%	57%
Age			
19-39	21%	7%	14%
40-54	52%	27%	20%
55-64	27%	56%	25%
65+	N/A	10%	41%
Health insurance			
Medicaid	N/A	35%	26%
Medicare	N/A	24%	62%
Dual	N/A	20%	*
Private	N/A	2%	*
Uninsured	100%	19%	*

Data from Access Health Spartanburg (AHS)

*Suppressed due to small sample sizes.

AHS engaged in primary data collection to track changes in medical and social risk factors as well as patient engagement. They developed a case severity screening tool, which consisted of 18 medical and psychosocial markers and systematically determined enrolled patients' levels of need.^{5,6} Patients were screened at enrollment and, where possible, at exit. Among the individuals with two data points available, their medical and social risk profile generally shifted toward lower risk levels and away from moderate risk levels (Table 2). Higher risk levels were rare among all individuals at both assessment periods.

Table 2: Medical and Social Severity Levels at AHS (n=122)

Severity level	At enrollment	At exit
Low Medical/Low Social	20.5%	63.1%
Moderate Medical/Low Social	52.5%	27.9%
High Medical/Low Social	10.7%	1.6%
Low Medical/Moderate Social	6.6%	3.3%
Moderate Medical/Moderate Social	8.2%	4.1%
High Medical/Moderate Social	0.0%	0.0%
Low Medical/High Social	0.8%	0.0%
Moderate Medical/High Social	0.8%	0.0%
High Medical/High Social	0.0%	0.0%

Patient engagement was tracked at enrollment and 6 months with the Patient Activation Measure (PAM),⁷ which places patients into levels where higher levels indicate more engagement (Table 3). Most patients entered the HOPS at mid to lower PAM levels. There was no clear pattern to changes in PAM levels with patients most commonly remaining at their initial level upon program exit.

Table 3: Changes in Patient Activation Measure (PAM) Levels at AHS

Level at enrollment (n = 255)	Level at exit				
	1	2	3	4	NA
1	13	8	2	3	17
2	14	29	11	7	34
3	6	14	15	11	23
4	2	1	7	18	20

NA: Not assessed.

Data available from the South Carolina Revenue and Fiscal Affairs Office allows for some rough benchmarking of hospital utilization under the HOPS at AHS. Table 4 compares the 256 patients at AHS to 117 patients in another HOP, at AnMed Health – which served as a comparison group for AHS – according to emergency department (ED) visits, inpatient admissions, and 30-day hospital readmissions. Although patients at AHS reduced their use of ED and inpatient services, similar declines were observed at AnMed HOP. At AHS the 30-day readmission rate remained fairly stable as it rose at AnMed HOP. We note that these comparisons must be made cautiously, because the AnMed HOP patients had different starting levels for each of the hospital use measures.

Table 4: Hospital Utilization at AHS and Comparison Site

	AHS		Other HOP	
	Pre	Post	Pre	Post
ED visits per person	1.45	1.06	0.63	0.33
Inpatient admissions per person	0.53	0.29	0.46	0.21
30-day hospital readmission rate	23%	21%	11%	21%

Pre: 180 days before enrollment. Post: 180 days after enrollment.

Data from Virginia Commonwealth University Health System (VCUHS)

VCUHS measured PAM scores in TakeCCare program enrollees at the time of enrollment and, when possible, 3 months later. Scores are reported on a scale of 0 – 100, with higher scores indicating greater activation (Table 5). Average PAM scores increased among patients with enrollment and exit measures. In addition to PAM, the TakeCCare team assessed social service needs using the Health Leads Toolkit,⁸ and tracked the proportion of patients with needs at two time points. On the whole, there was a reduction in needs from enrollment to the time that patients exited the intervention three months later.

Table 5: Patient Activation Measure (PAM) and Social Service Needs at VCUHS

	At enrollment	At exit
PAM score (N=25 patients at both time points)	54.2	62.1
Social service needs (N=20 patients at both time points)		
Food insecurity	25%	0%
Utility needs	0%	5%
Housing Stability	10%	0%
Child care	5%	0%
Financial issues	0%	5%
Transportation	25%	0%
Literacy	20%	10%
Safety	5%	0%

Hospital use data available from VCUHS included 39 patients who remained in the VCUHS TCC program for the 3-month intervention period, and a historical comparison group of 207 patients – those in the Complex Care program during the 2 years prior to the start of TakeCCare. Table 6 compares the 39 patients at VCUHS/TakeCare with 207 comparison group patients. Both groups saw a reduction in inpatient admissions, although only the TakeCCare enrollees showed lowered average frequency of ED visits. We note that, similar to the case for AHS, these comparisons must be made cautiously, because the comparison group patients had different starting levels for each of the hospital use measures.

Table 6: Hospital Utilization at VCUHS and Comparison Group

	VCUHS		Comparison	
	Pre	Post	Pre	Post
ED visits per person	1.05	0.95	0.76	0.91
Inpatient admissions per person	1.97	1.21	1.56	0.91

Pre: 180 days before enrollment. Post: 180 days after enrollment.

Data from ThedaCare (TC)

Hospital utilization data available from TC focused on the subset of patients enrolled due to history of high utilization, i.e., having 3 or more ED visits in the prior 6 months. For its comparison group, the TC team drew a sample of patients at a different TC internal medicine practice, in Neenah, WI, who had the same utilization history but did not have access to the community paramedicine service. Table 7 shows the average ED and inpatient admissions at enrollment and at 6-month follow-up for the 19 patients at TC and 20 at the comparison site. ED visits fell substantially at TC site while increasing at the comparison site. Inpatient admissions also fell substantially in the intervention group while remaining flat in at the comparison group.

Table 7: Hospital Utilization at TC and Comparison Group

	TC		Comparison	
	Pre	Post	Pre	Post
ED visits per person	3.74	1.58	5.65	6.15
Inpatient admissions per person	0.74	0.11	0.45	0.45

Pre: 180 days before enrollment. Post: 180 days after enrollment.

TC also had a strong focus on patients with Type 2 diabetes. In an early analysis they matched 18 patients in their CP program with 18 comparison patients according to initial A1c level (all>9), age, & sex. As shown in Figure 2, patients in the TC CP program tended to have large reductions in A1c levels, while the matched comparison patients' A1c levels either increased or remained roughly the same.

Training and Responsibilities of Clinic Extension Staff

The three sites vary in the training and job assignments of the clinic extension staff (Table 3). CHWs at AHS have varied educational backgrounds, some having college degrees and others having only completed high school. AHS emphasizes that CHWs have relevant professional or life experience rather than fulfilling a formal educational requirement. CHWs and other team members also participate in “poverty simulation” training where attendees are given real-life scenarios about financial, time, childcare, transportation, and other challenges and work through potential solutions. The CHWs receive additional training on ways to identify and navigate clients to access social services (e.g., housing, transportation).

The MOWs at VCUHS’s TakeCCare program are required to have a bachelor’s degree in health sciences. The MOWs also participate in a variety of continuing education activities, which include instruction in patient engagement strategies (e.g., motivational interviewing), chronic disease processes, self-management of chronic illness, cultural competency, and an evolving range of topics relevant to their roles in health education and promotion.

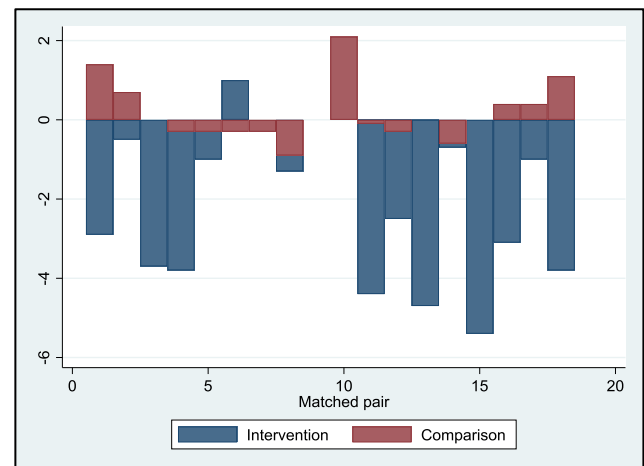
CPs at ThedaCare are fully licensed paramedics who receive additional didactic classroom and clinical training (400 hours total) in chronic disease management, community outreach, and prevention. They conduct routine health monitoring, assist with medication management, and reinforce the primary care treatment plan. TC is tracking and complying with Wisconsin state regulations and is in the process of working out the details on continuing education.

At all three sites, the clinic extension staff are responsible for identifying needs and connecting patients to appropriate social and medical services. But as illustrated below, each model offers a unique set of patient services within a distinctive workflow.

CHWs at AHS draw upon a wide range of donated medical and behavioral health services from a network of clinical professionals and have access to programs offering donated durable medical equipment, discounted or free prescription drugs, vocational rehabilitation, support for GED and community college education, and free mobile phones to SNAP recipients. They also connect patients with AHS’s “Gift-In-Kind (GIK) Closet” stocked with a variety of paper products, toiletries and childcare supplies purchased at a discount from a local United Way warehouse that stocks unused or returned items donated by Wal-Mart.

The MOWs at VCUHS have special authority and resources to address some socioeconomic issues. For example, the MOWs allocate transportation vouchers for medical appointments and help patients apply for subsidized bus passes. They are also armed with \$50 debit cards designed to “solve \$10 problems on the spot” without having to obtain supervisor approval

Figure 2: Changes in A1c Levels for Diabetics at TC relative to a Matched Comparison Group



before every transaction. Such problems may include buying the patient lunch, pill organizers, or other small items immediately. MOWs also work directly with patients outside of their homes to help them find nearby stores with healthy food, make healthy choices, and develop shopping lists within patient budgets.

CPs at ThedaCare are fully licensed paramedics who provide substantial clinical assessments and care in the home, which may include monitoring breathing, drawing blood, checking on wounds, and conducting medication reviews. But as CPs, they have additional training in chronic disease management and are on the lookout for connections between poor health and socioeconomic problems that they might address as well as home health hazards that may put patients at risk for injury.

Activities Outside of the Clinic

At all three sites, MOWs, CHWs and CPs provide “eyes in the home” that reveal a wide range of unique problems that can impede a patient’s ability to effectively self-manage their care. Common examples include patients who need to actively monitor their bodyweight but do not have a scale in the home, as well as people who have dietary restrictions but do not have the recommended foods or preparation capabilities. The value of home visits is not to catch patients doing “the wrong thing”, but rather, to partner with patients in problem solving. This might be as simple as buying a scale for the patient’s home. In another example at VCUHS, a MOW helped a patient create a “healthy-option Dollar Tree list” to find healthy foods that were within the patient’s weekly budget.

Similarly, the CHWs at AHS investigate the underlying obstacles to the problems patients present at the clinic by observing and interacting with them outside the clinic setting. For example, a CHW would give patients a notebook and guide them to write down questions for their doctors before an upcoming visit. As a CHW described, the AHS program is about “making sure they [patients] have the tools that they need to be able to do what they need to do for themselves.”

Compared to the clinic extension staff at the two other sites, the CPs at TC have more formal medical training. This distinction is reflected in some frequently performed out-of-clinic activities such as medication review. A physician described how CP home visits improve medication management:

“I’ve had patients that we just can’t see a difference in their lab results or we know something is going on. She can’t tell us what she’s on for meds, and having him [the CP] be able to get there [in the patient’s home] and say, ‘This is what’s in the bottle, this is what we have, she had extra bottles of this so we got rid of them and we took them to the drop box and everything is set and matches the list right.’ ... a lot of times our computer list does not match what the patient’s actually doing ...”

The combination of paramedicine skills and regular home visits has been key to discovering the causes of some puzzling combinations of medical symptoms and stopping the escalation of health problems. In one example, a patient was enrolled with medical, behavioral, and social complexities, including frequent pseudoseizures. Within two weeks of starting the program, the diagnosis of mass cell disorder was made, and an over-heated home was identified as a trigger to the pseudoseizures. Meanwhile, the CPs worked with the clinical team to improve

home safety and connected the patient with specialists to address the root cause of the pseudoseizures. The patient has since been stable and reported to have a drastic reduction in hospital use.

Nuances of Patient Engagement

Interviewees across all three demonstration sites spoke in detail about the importance of having the “right” attitude and personality required to work effectively with patients outside of the clinical environment. Keywords offered included “empathy”, “being non-judgmental”, “good listener”, “people person”, and “somebody that can connect easily”. As mentioned above, members of the AHS care team undergo a poverty simulation exercise in which they navigate life and the myriad decisions large and small given various barriers. As expressed by a member of the AHS care team,

“They [the poverty simulation] give you this whole scenario and you walk through their life.” “You’re the single mom with the two kids and you don’t make enough money to buy insurance, but your job doesn’t offer insurance, and your one child is diabetic, or you’re diabetic. How do I get to work? And how do I provide childcare? You have to make decisions with a budget ... you got to work but you got to go to the SNAP office today, but they’re only open while you’re working ...”

This deep appreciation – that poor health-related decisions often result from a cascade of circumstances and not simply standalone choices – is reflected in the importance that AHS places on its CHWs having relevant life experiences, which cannot be easily replaced with formal training:

“You have to kind of have lifetime experience, I think is what’s important. ... You don’t have to be old, but you do have to have been experienced. You’ve had to have experienced some things yourself to kind of put yourself in other people’s shoes. It’s very difficult to relate to somebody that you can’t relate to their experience. The life experience is invaluable in a community health worker, just being different places, trying different things, learning about different things, having experienced different things.”

The VCUHS team also strongly embraces the importance of using a trauma-informed approach. They also consider the college degree as a strength, allowing their MOWs to effectively communicate with clinicians, navigate the healthcare system, and provide health education even though the MOWs are younger and do not have the same lived experiences. As described by a supervisor,

“[College graduates] tend to come a little bit better prepared to actually educate our patients, because a lot of what we do, in addition to just reacting to whatever their situation is, is proactive as it relates to providing education, and I think they just come a little bit more prepared to cover the basics.”

Extended clinic staff across the three sites described examples that required strong persistence to uncover deeply hidden issues that affect their patients. For example, a MOW at

VCUHS worked with a frequently hospitalized patient with psychiatric comorbidities who missed so many psychiatric appointments that the office refused scheduling new ones for her. The MOW eventually learned that the patient did not have reliable transportation and had great difficulty trusting people. The patient also had asthma and kidney disease but did not know how to use her nebulizer and frequently left the dialysis clinic before her treatment was complete. In response, the MOW coordinated with the psychiatrist's office and arranged for transportation to ensure that appointments would be kept and requested only specific drivers familiar to the patient in order to allay mistrust. The MOW also arranged for a nurse to retrain the patient on nebulizer use, and accompanied the patient, who often felt lonely and bored, on dialysis visits to ensure completion.

In addition, some specific examples of patient interactions demonstrate the importance of incorporating neighborhood context and community culture into the outreach and engagement approach to effectively garner trust from the patients. For instance, the MOWs at VCUHS emphasized that patients often felt intimidated or embarrassed when speaking with clinicians. As one MOW indicated,

"I'm not a nurse, I don't have any scrubs on. To some of them, I'm just a regular person. ... so they just talk to me and they tell me everything."

In contrast, the complex care team at ThedaCare emphasized the value of the paramedic uniform for instilling patient confidence and trust. As one CP described,

"... you're trained from a young age to trust fire fighters, trust police officers, trust paramedics so that trust factor is kind of instilled in our community"

This point was echoed by a TC physician who inquired about reasons after observing improved patient compliance:

"... there are two of them [patients] who have specifically told me, "the guy in the uniform. It's the guy in the uniform."

Communication within Care Teams

Another difference concerns communication processes within care teams. At VCUHS, MOWs are fully embedded in regularly scheduled clinical team huddles and have full access to patients' medical records and appointment schedules, which they can access remotely and discuss with patients in their homes. Occasionally, MOWs will call a nurse or team leader from the patient's home and engage in a three-way conversation about immediate issues.

In contrast, CPs at ThedaCare communicate with care teams primarily through a fully functioning electronic health record (EHR). CPs have access to tablets, which allow them to read notes before, and add new information after, visits. Although team members can request in-person or phone conversations, most communication takes place through EHR notes.

At AHS, the communication workflow of the care team is less protocol driven and more varied than the other two sites. There is an abundance of standing meetings covering a range of topics from programmatic to case discussions, but a substantial amount of team coordination and communication appears to be informal and as-needed. This communication approach

appears to reflect the broad partnerships in HOPS where each partner organization assigns a point-of-contact for the AHS care team.

Patients most likely to benefit

VCUHS and ThedaCare are currently refining their enrollment criteria and complex care approaches to better synchronize service and needs. Both sites consider the lack of transportation and unhealthy eating common but largely addressable problems. Home visits appear to most benefit patients who are motivated to improving their health, particularly those with supportive family members, but need specific information and coaching on exactly how to do it. Conversely, some patients who seem to be good candidates initially are simply not yet ready to commit to a healthier lifestyle. Others are not willing or able to follow the program requirements for participation due to scheduling or other issues. Moreover, both programs refer patients with behavioral health issues to providers with whom they have partnered to manage these issues directly.

The HOPS program is open to all uninsured, low-income Spartanburg County residents with at least one diagnosed and unmanaged chronic condition and three or more ED visits in the past year, and has an administratively defined endpoint (i.e., qualified for health insurance or disability assistance); but the staff made similar observations that “activated patients” are most likely to benefit. Because HOPS is more open-ended than the other two sites, many non-activated individuals may remain enrolled but only become engaged later in the program.

Implications and Lessons Learned

The three clinic extension staffing models compared in this paper have broadly similar program goals, defined hours and modes of communication between patients and clinic extension staff, and challenges faced by patients. But they differ in patient demographics, program enrollment criteria, and duration of enrollment, all of which drive their activities in various ways. The complex care program at AHS serves a population that is uninsured and under age 65, the one at TC serves mostly Medicare patients and adults 55 and over, and the one at VCUHS serves a more diverse mix of patients by payer and demography.

The quantitative data available for this report data do not support rigorous evaluation of program outcomes. In some cases, a comparison group was not available while in others a comparison group was available only from a convenience sample, which was used for rough benchmarking purposes. Still, the available data provide some early indications of the programs have performed in their early stages. There is some preliminary that the intervention at AHS improved patients’ medical and social risk factors but there were no changes in patient activation. There were some reductions in hospital use but this was not much different from the comparison group. At VCUHS, there was some evidence of improvement in patient activation and connections to needed social services. Like AHS, there were some reductions in hospital use but these were not much different from the comparison group. At TC, there was somewhat stronger evidence of program impacts, including reduced hospital use and improvements in A1c control for Type 2 diabetics.

The qualitative analyses have implications for providers and health systems seeking better ways to manage complex high-utilizing patients. These models form a sort of menu of options, each of which offers different strengths and competencies. The MOWs at VCUHS work with a

narrowly defined set of patients, as the most complex cases are excluded from the TakeCCare program. This model may offer the most relevant lessons for health systems that are interested in beginning a formal program of complex care intervention in a fairly limited and predictable way.

In contrast, the CHWs at AHS are embedded within a wide-ranging system of patient support services and a large network of health and social service providers under HOPS. Under this program, which is part of a statewide initiative in South Carolina, AHS faces the formidable task of serving a large and extremely high-need population under very tight resource constraints. Thus, the CHWs at AHS are called upon to fill gaps within a large-scale yet under-resourced operation. This model appears to offer the most relevant lessons for health systems that already have a mission or mandate to serve a large population of complex patients with a limited ability or desire to specialize in particular subpopulations.

The CPs at ThedaCare add an element of clinical expertise to their clinic extension activities. This element is particularly important for ThedaCare's population, which includes a greater percentage of patients ages 65 and over. As a result, this model requires a more highly trained, and more costly, cohort of clinic extension staff. Thus, the CP model is likely to be most appealing to health systems targeting high-cost patients needing customized medical as well as social interventions outside of the clinic.

All three TCC sites view the establishment of patient trust as foundational to their interventions. However, contrasting experiences at TC and VCUHS highlight the way in which differing community perspectives on images of professional authority, i.e., "the uniform", can help or hinder patient trust. Clearly, both MOWs and CPs have a positive view of their unique training and roles in their care teams. But the differing perspectives may also reflect differences in patient populations and their accumulated life experiences. VCUHS is located in an inner city with a significant African American population where trust in authority figures from law enforcement and medicine has a difficult and complex history. ThedaCare has a patient base that is predominantly sub-urban/rural and white where trust in local uniformed service personnel is likely an easier assumption to make. These experiences suggest that health systems seeking to implement similar home-based care interventions should be mindful of how signs of authority are perceived by their target populations.

Clinic extension models also depend on scope of practice laws, which are typically developed at the state level. The CP program at TC began under a pilot program in Wisconsin, which was later extended. As of mid-2018, 11 states had similar laws in place and 17 had defined processes to expand the paramedic scope of practice.⁹ The early successes of CP programs¹⁰ has led to rapid emergence, implementation, and evolution of CP models, which have often outpaced laws and regulations. Moreover, most states with legislated scope of practice identified fewer than half of the CP skills enumerated by the Joint Committee on Rural Emergency Care.¹¹

Similarly, the scope of practice for CHWs is still evolving with varying requirements and models emerging in various states. As of 2017, 9 states had laws or statutes related to CHW certification in place, and 9 had non-legislated certification programs.^{12,13} In April 2018, a non-binding CHW certification was established by the Virginia Certification Board, a not-for-profit credentialing organization, in consultation with the Virginia Department of Health, the Virginia Community Health Worker Advisory Group, and the Community Health Worker Association. Since then, TakeCCare leadership has designed its on-boarding process to ensure that the

existing MOWs have the training and skills to be certified. Universal credentialing standards can potentially lead to improved compensation and job stability, better integration with the health systems, and insurance reimbursement for services. This process, however, has been challenging due to the wide-ranging scopes of practice based on varying local and programmatic needs.¹⁴

Lessons learned from the three complex care staffing models reviewed in this paper should be viewed in light of the dynamic health policy environments in which they operate. For example, all three sites operate in states that did not expand Medicaid eligibility under the Affordable Care Act (ACA). The structure of the program at AHS is tied directly to state policy in South Carolina focusing on low-income individuals, ages 19-65, who would remain uninsured as a result of the state's decision not to expand Medicaid eligibility. It is also dependent on a network of physicians providing donated care to HOPS patients.

The programs in Wisconsin and Virginia were originally crafted as standalone initiatives in the absence of any major statewide policy change focusing on their target populations. However, the policy environment in both of these states is now in flux as both are currently considering the expansion of Medicaid eligibility, but potentially with additional requirements such as work documentation for specific populations.^{15,16} Such policy changes are likely to rebalance the health, social services, and administrative needs of complex patients, and therefore, the types of problem solving in which extended clinic staff will need to be engaged.

Emerging policy changes in Medicare also have implications for the use of extended clinic staff. For example, under Medicare's Quality Payment Program (QPP),¹⁷ physician practices with large numbers of complex patients will have access to enhanced payment through a newly developed complex patient bonus. Enhanced payment will be available for practices with patients who have high hierarchical clinical condition (HCC) risk scores and high proportions of dually eligible patients. Longer term, the Center for Medicare and Medicaid Services (CMS) seeks to develop a more precise adjustment for medical and social risk factors in the QPP. In this policy environment, provider groups have opportunities to experiment with complex care management approaches with the possibility of using enhanced payment to help support the use of clinic extension staff.

The Medicare Shared Savings Program and other accountable care organization initiatives provide additional incentives for healthcare providers to incorporate extended clinic staff. In particular, opportunities for ACOs to achieve shared savings are substantial for those that are successful at addressing social determinants of health, which are the core focus of the models analyzed in this paper.

This report reviewed the performance of three interventions to inform program design considerations around the use of clinic extension staff to address the needs of complex patients. Key design considerations include the breadth of patient enrollment criteria, comprehensiveness of clinical and social support services, flow of information between home care and clinic care, and approaches to facilitating trust between patients and home-visit staff. These considerations must be made in the context of local patient needs, health system resources, and emerging health policy reforms.

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