

Integrating Hospitalist Services via Telehealth Across a Regional Rural Hospital Network

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Integrating Hospitalist Services via Telehealth Across a Regional Rural Hospital Network

Introduction**Purpose**

The purpose of this paper is to describe the integration of hospitalist staffing across a network of rural hospitals in North East Minnesota utilizing telehealth and an advanced practice provider model. The literature review will first provide insight into the hospitalist movement and the utilization of hospitalists in rural hospitals as a means to provide more specialized hospital care (Casey, Hung, Moscovice, & Prasad, 2014; Dougan, Montori, & Carlson, 2018). The hospitalist model also protects family practice physicians from call schedules that result in job dissatisfaction and burnout improving recruitment and retention of primary care physicians in rural communities (Butcher, 2017; Lee & Nichols, 2014). Next, articles will be reviewed explaining how rural hospitals are using telemedicine support by physicians along with advanced practice provider hospitalists to provide safe, quality, economic hospital care (Boltz, 2019; Butcher, 2017; Gutierrez, Moeckli, McAdams, & Kaboli, 2019). Finally, the outcomes of an increased rural hospital census due to right patient, right place, right time (Nowak, Rimmasch, Kirby, & Kellogg, 2012) will be described through this integrated hospitalist staffing model. Based on the findings from the literature, recommendations will be presented for best practices in implementing an integrated hospitalist program in a rural health network utilizing telemedicine services to help keep rural hospitals viable while providing high quality, safe hospital care. A comprehensive plan for implementation of an integrated hospitalist staffing model between Critical Access Hospitals and a Tertiary Level 1 Trauma Medical Center utilizing telemedicine and advanced practice providers in the rural setting will be described for the reader.

Need for the Study

Rural hospitals continue to close due to declining patient populations, decreased patient censuses, increasing market competition, and decreasing patient revenues (Kaufman et al., 2016; Cosgrove, 2018) that result in financial distress (Holmes, Kaufman & Pink, 2017). Between 2010 and 2014, 47 rural hospitals closed decreasing access to hospital care for 1.7 million Americans (Kaufman et al., 2016). Additionally, rural hospitals struggle to recruit and retain physicians (Lee & Nichols, 2014). Communities at greater risk for hospital closure have larger elderly populations and a poorer population dependent on public insurance programs than rural hospitals that remain viable (Kaufman et al., 2016). Due to the loss of local hospital services, these communities are at greater risk for negative health outcomes and economic hardship. An innovative model is needed to provide economic rural hospital medicine that allows rural hospitals to remain operational and keep patients in their home community hospitals without compromising safety and quality of care. Integrating hospitalist staffing of critical access hospitals with a tertiary Level 1 trauma medical center provides specialized hospitalist physician support to help keep patients in their home community with the on-site care of an advanced practice provider.

Literature Review

A comprehensive literature review is needed to understand the history of the hospitalist movement and its integration into rural hospital settings. Rural hospitals have unique challenges that limit their ability to staff a full-time hospitalist physician. These barriers have spurred innovation to support the needs of rural hospital patients through the use of telemedicine technology along with the expertise of advanced practice nurses or physician assistant hospitalists. This integrated model allows for high quality hospital care provided in the home community of the patient.

Hospitalist Services

History of the hospitalist movement. The term “hospitalist” was created by Robert Wachter, MD and Lee Goldman, MD, in a *New England Journal of Medicine* editorial in 1996 (Wachter & Goldman, 1996). The movement of physicians dedicated to hospital medicine began its momentum in the late 1990s (Wachter, 1999). Hospitalists were initially defined by Wachter as physicians who spent greater than 25% of their time in the hospital as the physician of record for the patient. These hospitalist physicians took a patient handoff from the primary care physician in the clinic and then returned the patient to the primary care physician at discharge. There were concerns by the medical community that this model would result in uncoordinated care resulting from poor handoffs. Handoff of information had to be coordinated through telephone calls and faxing of written documentation (Wachter & Goldman, 2002) as electronic medical records did not widely exist. There were early concerns that patients would be dissatisfied with seeing a physician that did not know them in the hospital. At the time, patient continuity with one provider across all levels of care was deemed a hallmark of high-quality care (The hospitalist turns 20, 2016).

Hospital medicine evolved as the complexity of hospitalized patients increased and primary care providers found it increasingly difficult and less financially advantageous to split their time between their clinic practice and their hospital coverage. Health care organizations, particularly managed care organizations, were also looking for ways to improve the efficiency of their care delivery as hospital reimbursements continued to decrease. These factors resulted in a movement from a mixed practice model where primary care physicians (PCPs) followed their patients from the clinic to the hospital, to a model where dedicated hospitalist physicians served patients in the inpatient hospital setting (Wachter, 1999). The evolution of the hospitalist movement was defined as the Four Stages of Hospital Care by Wachter in 1999 (see Figure 1).

The definition of the hospitalist also evolved. The National Association of Inpatient Physicians (NAIP), a professional organization developed specifically to represent hospitalists in 1998 (SHM, 2020a), later defined hospitalists as physicians whose primary professional focus (clinical, teaching, research, or administration) was general inpatient care (Wachter & Goldman, 2002). NAIP was renamed the Society of Hospital Medicine (SHM) in 2003 (SHM, 2020a).

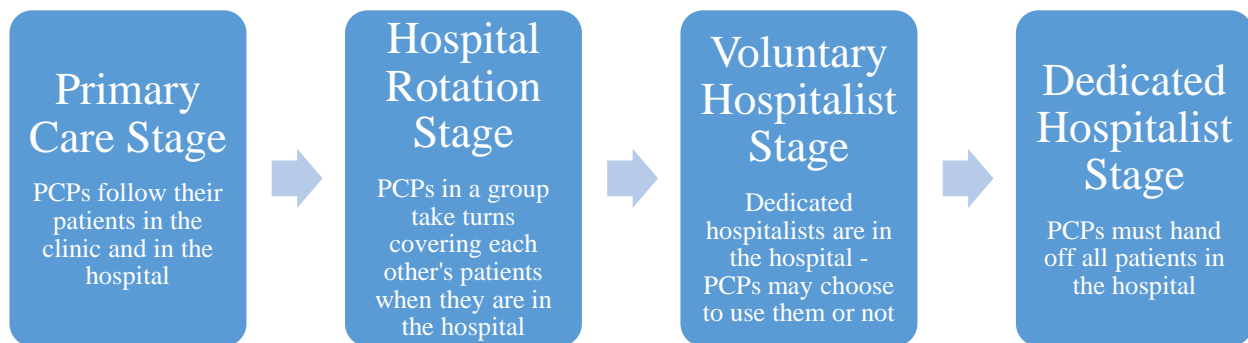


Figure 1. The Four Stages of Hospital Care (Wachter, 1999).

Today, SHM defines a hospitalist as a clinician whose primary professional focus is the general medical care of hospitalized patients (SHM, 2020c). The role of hospitalists is further defined as clinicians who engage in clinical care, teaching, research and enhancing the performance of hospitals and healthcare system. Unlike other specialties, hospitalists are focused around a site of care (the hospital) rather than an organ (like cardiology), a disease (like oncology) or a patient's age (like pediatrics). Hospitalists help manage patients through the continuum of hospital care, often seeing patients in the emergency room, following them into the critical care unit and organizing post-acute care (SHM, 2020c).

Early concerns of patient dissatisfaction were unfounded (Wachter & Goldman, 2002). Advantages of the hospitalist model were shown to include decreased length of stay, decreased hospital cost per patient admission, and decreased readmission rates without compromise of quality (Peterson, 2009). These realizations caused the hospitalist movement to grow rapidly. Over the first 20 years, the hospitalist community grew to over 50,000 clinicians (Wachter & Goldman, 2016).

Hospitalists in rural hospitals. The hospitalist movement has expanded from urban community medical centers to rural community hospitals primarily to eliminate the call burden for rural physicians and improve recruitment and retention of physicians (Casey et al., 2014). Rural hospitals utilize employed or contracted internal medicine or family medicine physicians as well as nurse practitioners and physician assistants in the hospitalist role. Hospitalists are less likely to have a full-time dedicated hospitalist role in rural settings and are more likely to serve in additional roles such as emergency department care, clinic coverage, and nursing home care.

Rural hospitals with hospitalist programs have higher mean inpatient volumes than those without hospitalists and are most likely to be rural referral centers, have sole community hospital

or prospective payment system status, belong to a health system, and have private ownership or for-profit ownership (Casey et al., 2014). Critical access hospitals (CAHs) and publicly owned hospitals are less likely to have hospitalist programs. Critical access hospitals are designated rural hospitals with no more than 25 beds that provide 24-hour emergency services and have an average annual length of stay of up to 96 hours for acute care patients (CMS, 2013). Despite the lower incidence than larger rural hospitals, CAHs use of hospitalists continues to rise to meet staffing needs, increase hospital census and improve quality of care delivery (Dougan et al., 2018).

Hospitalists bring an expertise in acute care and a team-based approach to rural hospital care. Rural hospitals find that hospitalists are able to quickly respond to changes in the patient's condition and have more time to dedicate to hospitalized patients than primary care providers who are also responsible for clinic schedules during their hospital coverage. Because of the accessibility and approachability of the physician or provider, nurses are often more satisfied with a hospitalist model (Dougan et al., 2018). This lends to improved recruitment and retention of rural nurses, who like rural physicians and providers, are also in short supply.

Positive financial impacts of a rural hospitalist program include increased inpatient admissions, fewer patient transfers to other hospitals, and ability to treat higher acuity patients (Casey et al., 2014). Other positive outcomes include decreases in length of stay, improved recruitment and retention of physicians and providers and improved productivity of primary care physicians. Negative outcomes of implementing a hospitalist program in a rural hospital are that physician salary costs or contracted service cost can be more than the revenue directly generated by the hospitalist. Rural hospitals often utilize advanced practice providers instead of physicians to decrease the salary impact to the hospital (Bergeron, Neuman & Kinsey, 1999). Another

hybrid hospitalist model that has been shown to be less costly than traditional physician hospitalist coverage is to have internal medicine physicians from a larger hospital rotate to a rural hospital to cover the hospital in the morning, provide internal medicine specialty clinic visits in the afternoon, and cover call overnight (Bunge, 2018). This hybrid model supports the PCPs in clinic with complex patient consultations and procedures that can then be delivered close to home as well as providing the expertise of a hospitalist in the rural hospital.

Despite the inability to cover the cost of a hospitalist program with hospitalist revenue alone, many rural hospitals continue to use the model because it allows them to recruit primary care physicians due to decreased or no inpatient care and call schedules allowing for work-life balance (Casey et al., 2014). High physician workload has been shown to negatively affect physician families and in turn directly impacts their retention in rural and underserved areas (Lee & Nichols, 2014). Hospitalist programs also increase patient census and case mix index for the hospitals (Casey et al., 2014). More patients in hospital beds with higher acuity help to offset fixed overhead costs to keep the doors of the rural hospital open (Cosgrove, 2018).

Implications for hospital care delivery. Hospital length of a stay is one metric that is closely monitored by hospitals because of its impact on hospital financial performance and patient outcomes (Colwell, 2014). Patients of hospitalists, in comparison to PCPs, have been shown in multiple studies to have lower lengths of stay by as much as 0.67 days (Peterson, 2009; Salim et al, 2019; White & Glazier, 2011). This creates higher throughput and increases a hospital's ability to serve more patients. Lower lengths of stay that do not increase patient readmissions decrease the total cost per patient and improves hospital financial performance. Salim et al. (2019) noted there may be publication bias towards studies that favored hospitalists, but could not find unpublished studies to refute their impact on decreased length of stay. Cost

savings by hospitalists was seen in studies before 2010, compared to recent studies that did not see a significant difference between hospitalists and PCPs. This change in cost savings by hospitalists may in part be due to the increased compensation of hospitalists that is outpacing hospitalist revenue (SHM, 2018). Another direct impact to the total cost of care is the increasing complexity of hospitalized patients with multiple co-morbidities. These patients often require more hospital resources and have longer lengths of stay (Salim et al., 2019).

Where hospitalists shine is in clinical outcomes, leadership and teaching. Especially employed hospitalists who are more aligned with an organization's mission and values and therefore provide better quality of care and better clinical outcomes than locum physicians (Katola & West, 2018). Hospitalists lead quality initiatives such as development of patient safety guidelines in many hospitals (Salim et al., 2019). Some hospital medicine groups (HMGs) even tie their compensation to participation in quality improvement initiatives. Because of their focus on quality, hospitalists have lower hospital readmission and mortality rates for their patients than non-hospitalists (Salim et al., 2019). Hospitalists have become efficient teachers in the hospital setting and physician resident satisfaction is higher when training under a hospitalist than a non-hospitalist. Contrary to initial beliefs, patient satisfaction scores have also been shown to favor hospitalists over non-hospitalists (Salim et al., 2019).

Telemedicine

Telemedicine is a term that was first coined in the 1970s to describe distance medicine that used information and communication technologies to improve patient outcomes by increasing access to care and medical information (World Health Organization (WHO), 2009). In a 2010 report, WHO further developed the definition as the delivery of health care services, where distance is a critical factor, by all health care professionals using information and

communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities. Telemedicine has been further expanded into the term “telehealth” as technologies such as artificial intelligence (AI), virtual reality, and personal tracking devices are used to support an individual’s health (American Telemed Association (ATA), 2020). The Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services defines telehealth as the use of electronic information and telecommunications technologies to support and promote long-distance clinical health care, patient and professional health-related education, public health and health administration (The Office of the National Coordinator for Healthcare Information Technology (ONC), 2017). Technologies include videoconferencing, the internet, store-and-forward imaging, streaming media, and terrestrial and wireless communications. Telemedicine specialties include teleradiology, teledermatology, telepathology, telepsychology and more recently, telehospitalists (Carpenter et al, 2017; Kruse et al, 2017).

Rural hospital use of telemedicine. Telemedicine is a successful strategy to improve the accessibility of healthcare in rural areas by increasing the coverage of specialist services (Palozzi, Schettini & Chirico, 2020). Some of the most common telemedicine specialty services utilized by rural hospitals include teleradiology, teledermatology, telecardiology, teleorthopedics, and emergency room/triage services including telestroke (Capalbo, Kruzich, & Heggem, 2002). These remote services allow the local hospital to increase volumes and revenues that would not have been possible without telemedicine. Tele-emergency services help rural hospitals avoid unnecessary transfers and increase local hospital admissions (Natafji et al.,

2018). Healthcare outcomes are also improved for rural residents through improved access to specialty care. Rural residents minimize their travel, expense and time away from work and have their family and community support systems close when utilizing telemedicine services in their home community (Harrison, 2019). Many rural hospitals also institute telemedicine programs to provide supervision to nurse practitioners or physician assistants in emergency and hospital medicine and to provide educational opportunities for local physicians and providers (Zachrisson, Boggs, Hayden, Espinola, & Camargo, 2020). Telemedicine services improve rural hospitals' reputation of quality creating more confidence in the community and in turn increasing volumes (Potter et al., 2016; Washburn & Brown, 2015). This helps the rural hospitals to remain viable and continue to care for the community.

Barriers to telemedicine in rural communities include cost concerns, technology concerns, and lack of local leadership (Zachrisson et al., 2020). Lack of broadband internet access has also been considered as a potential barrier to rural telemedicine (Drake, Zhang & Polsky, 2019; Wilcock et al., 2019), however technologies continue to develop for mobile and cloud-based applications that don't require a broadband network, making telemedicine accessible to even the remotest of areas (Struminger & Arora, 2019). Restrictive reimbursement models and regulations for telemedicine may impact telemedicine adoption by already financially stressed rural hospitals (Mehrotra et al., 2016). Relaxation of telemedicine regulations and reimbursement models during the 2020 COVID-19 pandemic emergency declaration has rapidly accelerated the use of telemedicine (Galvin, 2020). The Bipartisan Rural Health Task Force acknowledged the positive impact of the COVID-19 legislation that addressed rural access to care through telehealth (Bipartisan Policy Center (BPC) Rural Health Task Force, 2020). They created recommendations for permanent policy changes to stabilize and transform rural health

infrastructure, promote the uptake of value-based and virtual care, and ensure access to local providers. The specific areas the task force recommends addressing to ensure access to rural telehealth services include:

- Support efforts to expand broadband and collect accurate broadband data in rural and tribal areas.
- Remove restrictions that prevent full utilization of currently available technology in areas without broadband access.
- Expand the list of authorized sites of service for telehealth to include the home of an individual in rural areas.
- Streamline licensure requirements and authorize licensed clinicians to provide inter-state services to Medicare beneficiaries.
- Prioritize rural-specific training curricula for the health IT workforce.

Telehospitalist. At its beginnings, the hospitalist specialty used telemedicine for telephone communications between care team members (Carpenter et al., 2017). As technology has advanced, so has the reach of the hospitalist. Video conferencing with a video cart of medical instruments including a stethoscope and high-resolution camera, allow the hospitalist to conduct a physical exam remotely with the assistance of a nurse or provider at the bedside with the patient. Mobile robot units can also be used to conduct a physical exam with the hospitalist controlling the medical instruments remotely.

Hospitalists can provide a full history and physical of a patient at the bedside with the use of a nurse run mobile cart or a robot unit. The most common use of this telehospitalist model is to provide overnight coverage to several rural hospitals from a telemedicine hub (Carpenter et al., 2017). Telehospitalists can also provide daily rounding to facilities that have short staffing

or to collaborate with nurse practitioners or physician assistants remotely. Cross-Coverage is another service that telehospitalists provide to patients in hospitals that do not have 24/7 coverage in house. Telehospitalists cover multiple rural hospitals from a remote location. This provides primary care physicians the ability to hand off patients overnight while assuring patient safety.

Advanced Practice Providers

As hospitalists. Over the last twenty years, the hospitalist definition has grown to include advanced practice providers (SHM, 2020c). Advanced practice providers (APPs) are licensed non-physician providers that include nurse practitioner and physician assistants, certified nurse midwives, clinical nurse specialists, and certified registered nurse anesthetists (Sarynski & Barry, 2019). Nurse practitioners (NPs) and Physician Assistants (PAs) are the APPs most commonly on hospitalist teams.

A specialty group of acute care nurse practitioners (ACNPs) began in the 1990s to focus their training and practice on the care of acutely ill patients in the inpatient hospital setting (Boltz, Cuellar, Cole, & Pistorese, 2019). Adult gerontology acute care nurse practitioner (AGACNP) training programs are realizing the need to provide more didactic, procedural and patient-centered simulation training to help produce competent hospitalist providers (Bryant, 2018). SHM's hospitalist core competencies help to guide the curriculum framework for a hospital medicine focus (Nichani, Crocker, Fitterman, & Lukela, 2017). This expanded training helps nurses develop the cognitive and affective skills needed to manage a wide range of patient conditions and situations (Bryant, 2018). In addition to patient care, NPs acquire skills to be more aware of hospital management such as hospital flow processes, quality initiatives and hospital goals.

Hospitalist residency or fellowship programs are another way for APPs to gain specialized training in the hospitalist field. Examples of such programs are available through Carolinas Health Care, now Atrium Health, and the Mayo Clinic (Atrium Health, 2020; Mayo Clinic, 2020). These year-long programs are designed to establish competency in SHM's core competencies of hospital medicine. SHM also offers an NP/PA boot camp training each fall to help bolster the skills of hospitalist APPs (SHM, 2020b). Hospitalist physicians feel more confident working along-side APPs with hospitalist specific training (del Pino-Jones et al., 2019). Physician confidence in APPs skill set is important for a successful collaborative hospital practice.

The hospitalist movement provides APPs with opportunities to provide comprehensive care using a collaborative practice model involving patients, families, physicians, healthcare team members, and community healthcare providers (Bilek, 2006). The APP works under a collaborative, interdisciplinary model, managing patient care, discussing patient's plan of care, and coordinating patient admission and discharge. Collaborative practice is an inter-professional process for communication and decision making that allows shared knowledge and skills to influence the patient care provided. The level of collaboration at each hospital is defined by state and federal regulations and hospital by-laws.

APPs can have a variety of patient care responsibilities on a hospital medicine service. They may be responsible for admitting patients on evening or night shifts (Butcher, 2017a). In some hospitals they are co-managing a specific patient population in collaboration with a physician hospitalist. APPs may also run observation units in a hospital with minimal oversight from physicians. APPs sometimes share patients with a physician who then bills for the patient. More practices are realizing the important contribution of APPs and their ability to manage

patients more autonomously and allow for them to bill for their patient care. As the cost of wages for hospitalist physicians continue to increase, while hospital reimbursements for patient care decreases, the role of the hospital APP will continue to grow in significance and responsibility to keep hospitalist departments viable.

In rural hospitals. APPs widely practice in rural hospitals due to the difficulty of recruiting physicians (Bergeron, Neuman, & Kinsey, 1999). APPs are more likely than physicians to move to rural areas because of less expectations regarding salary and benefits than physicians. APPs first moved into primary care roles in rural communities, but have expanded their reach into emergency rooms and rural inpatient hospital settings. The hospitalist role has expanded in response to the growing number of rural hospitals that are unable to recruit or afford a physician hospitalist (Boltz, et al., 2019). Hospitals realize increased physician retention, increased revenue, decreased average costs, and an increase in people seeking services when APPs providers are a part of the hospital care team (Bergeron et al., 1999).

The APPs collaborate with local primary care physicians in some rural hospital models or through telemedicine to physician hubs in more recent hospitalist models. This allows the necessary regulatory oversight as well as a team-based approach to provide the APPs a higher level of autonomy and safety (Peterson & Schell, 2018).

Rural Telehospitalist Models

Telemedicine is an innovative model for rural hospital care delivery that allows hospitals to provide high quality services at less cost. Several telehospitalist models exist to meet the hospital medical staff needs at rural hospitals. A hospital's decision on which model to implement will be dependent on their current hospital status and affiliations. The hospitalist physician supports several hospitals from the virtual telehospitalist location, while an advanced

practice provider or primary care physician, along with nurses, care for the patient in the rural hospital.

Hub-and-Spoke Model. The hub-and-spoke organization design has been described as a model that arranges service delivery assets into a network with an anchor establishment (hub) which offers a full array of services, complemented by secondary establishments (spokes) which offer more limited service arrays, routing patients needing more intensive services to the hub for treatment (Elrod & Fortenberry, 2017). Benefits of a hub and spoke model include consistency across an organization's operations, increased efficiencies resulting in more cost-effective care, enhanced quality through expertise availability, enhanced market coverage to better address population health needs, and improved agility to implement system wide changes for market adaptability.

Potential risks that need to be mitigated with a hub and spoke model include congestion at the main campus hub from patient referrals from the spokes, spoke overextension if located too far from the hub, and staff dissatisfaction at spokes due to perceived loss of autonomy to operate independently as they see fit. A proactive focus on mission and values by leadership at both hub and spoke sites, clear communication, well-defined workflows, relationship building and staff education will help to ensure success of implementation of a hub-and-spoke model (Elrod & Fortenberry, 2017).

Avera eCARE. Avera is an integrated health system based out of Sioux Falls, SD that utilizes a hub-and-spoke model. It has been a national leader in the telemedicine movement with many innovative eCARE telemedicine programs to serve the rural clinics and hospitals within the health care system (Avera, 2020). Wagner Community Memorial Hospital is a rural CAH located in Wagner, SD adjacent to the Yankton Sioux Reservation that is part of the Avera

Health system (Avera eCARE, n.d.). The hospital is located 120 miles away from the nearest tertiary hospital. Rising costs, difficulty with recruitment of physicians, and poor patient satisfaction forced Wagner Community Memorial Hospital to look for a new way to provide local hospital services. Utilizing telemedicine first through Avera eCARE emergency proved successful for the hospital. They developed a “grow your own” APP program to encourage local nurses to pursue nurse practitioner degrees. In exchange for supporting the nurses financially through nurse practitioner training, the hospital required a three-year service commitment. In 2018, an eCARE Hospitalist program was implemented and within six months the hospital nearly doubled its daily census from 1.89 to 3.69. The support of the telehospitalist program improved the confidence of the local APPs and created additional revenue for the hospital through increased patient volume. Avera also partners to provide telehospitalist services with rural CAHs not affiliated with a health system. In 2019, Avera served 14% of all critical access hospitals in the United States with their telemedicine services (Rural Health Information Hub, 2020).

Hospital partnership model. Independent rural community hospitals are finding it harder to sustainably operate without partnering with other hospitals or health systems. Economies of scale are needed to respond to decreasing patient volumes and reimbursements and rising costs of health care supplies, including human resources and wages. Formerly competing hospitals are now working together to mutually benefit each other for the sake of their communities.

Cabinet Peaks Medical Center and Kalispell Regional Medical Center. One example of a telehospitalist partnership is between Cabinet Peaks Medical Center (CPMC), a 25 bed CAH located in Libby, Montana (Cabinet Peaks Medical Center, 2020) and Kalispell Regional

Medical Center in Kalispell, Montana. In 2015, CPMC board of directors reached out to Kalispell Regional Medical Center (KRMC), the closest regional hub facility for help in sustaining its hospital medicine program due to difficulty recruiting and retaining physician providers (Boltz et al., 2019). KRMC agreed to partner with CPMC and hired three NPs to train and implement a cross organizational pilot project utilizing a telemedicine hospitalist model. The NPs underwent rigorous hospital medicine training program at KRMC. They established collegial relationships with physician providers at KRMC, familiarized themselves with the local and regional resources available, and practiced using video and telephone communications for collaboration. NPs attended the American Academy of Physician Assistant's 'Hospitalist Bootcamp' to further bolster their skills (Boltz et al., 2019). The NPs transitioned to CPMC after this initial training period and continued to work via telemedicine with the team at KRMC.

The NP cares for the patients on-site at CPMC with daily support from the hospitalist service at KRMC. Each patient is admitted to a designated physician hospitalist at KRMC. The NP reaches out to the hospitalists daily in Kalispell to round on the patients via telemedicine which may include text, phone call or video visit (Kalispell Regional Health, 2020). Hospitalists are available for consultation on all admissions, discharges and transfers as well as any patient concerns throughout the day or night (Boltz et al, 2019; Kalispell Regional Health, 2020). Live video visits are facilitated by the on-site NP for high acuity cases, complex diagnostic dilemmas or dynamic social factors that benefit from direct physician involvement.

This pilot partnership demonstrated a significant cost savings (28%) for CPMC using the telehospitalist model with an on-site NP in comparison to an on-site Locum physician staffing model. No statistical difference was demonstrated in LOS, mortality, readmission rates or HCAPHS scores between the telehospitalist and locum model. This model was adopted as the

permanent hospital medicine staffing model for CPMC and the partnership with KRMC, now Kalispell Regional Health (KRH), continues today.

Rusk County Memorial Hospital. Another example of a CAH that decided to use a partnership model is Rusk County Memorial Hospital in Ladysmith, WI. In 2014, Rusk County Memorial Hospital decided to move to a new hospital medicine coverage model because of their struggle to recruit and retain physicians in the community due to the hospital call burden (Butcher, 2017b). They lost six physicians from their community's 12 physician medical group over a period of two years. The remaining physicians were referring their patients to a hospital 45 miles away to prevent their call burden. Inpatient acute care days fell in half in 2013 and the hospital had to suspend its obstetrical services. The hospital started its own primary care clinic in an attempt to improve the situation, but the CEO recognized they would have the same recruitment and retention issues. In 2014, a hospitalist program was started utilizing nurse practitioners (NPs) to eliminate the call burden for local primary care physicians. Several models were explored and due to cost, a three NP model providing 24-hour coverage seven days a week with telephone collaboration from a contracted collaborating physician was utilized. A Rusk employed emergency physician was on-site at all times and was the admitting physician of record for patients at Rusk County Memorial. The emergency physician also provided support for patient codes. This program turned around the viability of Rusk County Memorial Hospital. In the first year of the program two physicians moved into the community and the hospital admissions increased 23%. In 2017, Rusk planned to implement a telemedicine pilot with the hopes that hospitalist physician support would allow the NP hospitalists to manage sicker patients. This was done through a partnership with a tertiary care center in a nearby city. Rusk County Memorial Hospital became part of the Marshfield Clinic Health System in February of

2018 under the new name Marshfield Medical Center – Ladysmith (Ladysmith News, 2018) and continues its hospitalist program today through a hub and spoke model.

Independent Contract Model. Independent telemedicine companies exist to contract directly with hospitals or health systems to provide telemedicine support to rural hospitals. For independent hospitals or smaller health systems with limited infrastructure, this may be a more cost-effective way to provide telehealth support to patients with the care of local APPs to help reduce patient transfers and keep patients in their home community (PR Newswire, 2015). Contracted companies provide consistent service and eliminate a hospital’s need to spend financial and human resources on physician recruitment. Depending on a hospital’s needs, they may choose to contract for only overnight services or complete 24 hours Telehospitalist support.

Eagle Telemedicine. Unity Point Health’s Trinity Regional Medical Center in Fort Dodge, Iowa, contracted with Eagle Telemedicine for general inpatient care coverage overnight (Unity Point Health- Fort Dodge, 2019). The program was designed to provide high quality care overnight to help keep individuals in their home community. A nurse rolled a telemedicine cart into the patient room and connected the patient with the Eagle Telemedicine physician. The remote physician accessed the patient’s medical record and lab results. Having telemedicine physicians increased patient response time in comparison to on-call physicians and limited the overnight visits the daytime providers needed to make to the hospital improving their quality of life. Contracting for these services also limited the number of temporary physicians needed to fill staffing gaps.

Jersey Community Hospital in Jerseyville, Illinois, faced similar challenges to many other rural hospitals. It was unable to sustain a full-time on-site hospitalist program and was no longer able to burden the local primary care physicians with hospital call. Patient hospital

volumes were declining. The decision was made to move to an on-site NP model with the support of contracted Eagle telephysicians to provide inpatient hospital medicine (PR Newswire, 2019). Soon after the implementation of the program, transfers by the emergency room physicians to other hospitals decreased due to the experience and expertise that the Eagle Telephysician team could provide to patients at Jersey Community Hospital. Patients and staff adapted well to the program. Eagle Telemedicine physicians round daily on patients and are available 24/7 to provide expertise and collaboration with local teams (PR Newswire, 2015).

Sound Physicians. Cody Regional Health's West Park Hospital Board of trustee's voted to move toward contracted telehospitalist services overnight through the company Sound Physicians when their average hospitalist census of 11 patients could no longer financially support an on-site physician overnight (Schulte, 2020). Along with the Telehospitalist services, the daytime on-site physicians will become part of the Sound Physician group and will no longer be employed by the hospital. The hospital hopes to realize a \$500,000 per year savings as well as mitigate physician vacancies due to no longer needing to recruit for physicians. Sound Physicians provides customizable, scalable hospitalist support to improve response times, quality of care and cost effectiveness for local hospitals (Sound Physicians, 2020).

Hospitals and health systems must examine their business to determine which telehospitalist model is the most cost effective and will produce the highest patient quality and patient and staff satisfaction. While the difficult realities of sustaining rural hospital care is similar across the country, each hospital has a unique organizational structure, culture, and community that it works within. Integrating through a hub-and-spoke, partnering with neighboring hospitals or contracting with an independent telemedicine provider to develop a

telehospitalist program are all viable options for rural hospitals to provide high quality, cost effective hospital inpatient care.

Right Patient, Right Place, Right Time

As rural communities experience decreasing populations and more poverty, and rural hospitals face decreasing revenues and volumes, it is more important than ever for services to be provided locally to bolster hospital census and provide access to health care that is close to home. Rural hospitals that are a part of integrated health systems have the advantage of access to specialty care and resources that help keep patients closer to home (Nowak, Rimmasch, Kirby, & Kellogg, 2012). Hospitalists are a growing specialty in rural hospital medicine to help keep patients with higher acuity in their local hospitals. Staying close to home may decrease the patients' length of stay and improve their outcomes (Mueller, Zheng, Orav, & Schnipper, 2019).

Combining telemedicine with a hospitalist program allows a team-based approach between an urban hub and rural hospitals. Employing APPs at the rural hospital with the support of a physician at the urban site allows for a more economical way of providing specialty hospitalist care. Keeping appropriate patients close to home with the support of a specialty hospitalist program also offloads the urban tertiary medical center to allow for improved patient flow and access. This allows for more timely access to specialty medical care when it is needed most. When a patient's status declines and a need for a higher level of care arises, the team-based approach allows for a well-coordinated transfer, in which the accepting hospitalist at the tertiary center is already aware of the patient's case and underlying issues. This may decrease the risk for mortality which is higher when there is lack of communication and health information exchange during an inter-hospital transfer (Usher et al., 2018).

Utilizing a telehospitalist model with an on-site advanced practice provider and a physician at a virtual hub for collaboration is an economical way for rural hospitals to bring the hospitalist specialty to rural residents. The increasing complexity of hospitalized patients with multiple co-morbidities as well as social and mental health concerns has created a need for specialized clinicians to oversee their management during a hospital stay (Avera eCARE, 2020). A telehospitalist model also allows the primary care physicians to focus on their clinic patients and improve clinic efficiency, by eliminating the need to be pulled away from clinic to address hospital patient issues. Utilizing a telehospitalist model increases response time to hospitalized patient needs around the clock resulting in improved patient outcomes and the ability for a hospital to handle more complex patients.

Solution

Essentia Health is an integrated health system located in Minnesota, North Dakota and Wisconsin with its headquarters in Duluth, MN (Essentia Health, 2020). It has a combination of rural CAHs and semi-urban prospective payment system (PPS) hospitals. Like other CAHs, Essentia Health experiences recruitment challenges and primary care physician team members who are requesting to decrease their hospital call burden. CAHs in the Essentia Health system have utilized locum tenens physicians or contracted with outside physician groups for on-site hospitalist services to meet their medical staffing needs. Because these coverage models are no longer sustainable from a financial standpoint, Essentia needs to move to a Telehospitalist coverage model.

When examining which Telehospitalist model to employ, it is important to look at the needs and resources of the entire health system. Essentia Health-St. Mary's Medical Center has experienced continuous growth in its patient census since becoming a Level I Trauma Center (Essentia Health, 2018, November) and a nationally recognized Stroke program (Essentia Health, 2018, August). Hospital administration also made a commitment to serving all patients who want to come to St. Mary's Medical Center and worked to significantly reduce diverting patients away from care at Duluth's medical campus. These factors made for a tertiary hospital that, at times, had limited capacity. Another organizational goal of Essentia Health was to keep patients in their home communities as often as possible to help off-load the tertiary hospital and reserve needed beds for higher acuity patients.

Essentia Health has a well-established hospitalist program at St. Mary's Medical Center in Duluth. It began with one hospitalist in 1998 (VonRueden, 1998) and has since grown to a team of 45 physicians and nine APPs. The depth in this team's clinical experience and size is an

incredible resource to the Essentia Health system. The system also has a mature telehealth program with dedicated administration and infrastructure. These internal resources, along with the organization's goals, make a hub-and-spoke model the best choice for Essentia Health.

A hub-and-spoke model keeps the telehospitalist program within the integrated health system. Each member of the telehospitalist team are working under the same mission and values and toward the same organizational aims. The hub-and-spoke model allows for alignment of strategy and standardization of practices across the system. Duluth hospitalist physicians can support the rural CAHs from a virtual hub in a hub-and-spoke model. APPs can be recruited to provide on-site care in collaboration with the Telehospitalist physician eliminating call burden for the PCPs and decreasing staffing costs in comparison to contracted physicians.

A hospitalist at St. Mary's Medical Center (SMMC) in Duluth can work out of an Admission and Transfer Center (ATC) hub. This Telehospitalist physician will collaborate with on-site APPs to manage the inpatients at CAHs in Deer River, Aurora, and Sandstone, MN (see Figure 2). Virtual telehospitalist visits can be conducted utilizing telehealth video visits with a video cart and remote diagnostic tools within 24 hours of the patient's admission to the CAH and as needed for visual and auditory examination of the patient. Daily rounding can be conducted via secure chat messaging through EPIC, telephone or video visit as requested by the APP. Additional support can be provided to the APPs and nursing staff via telephone or Epic Secure Chat consultation as needed. A 24 hour/ 7 day a week service is needed to fully support the CAHs and eliminate the call burden for local primary care physicians.

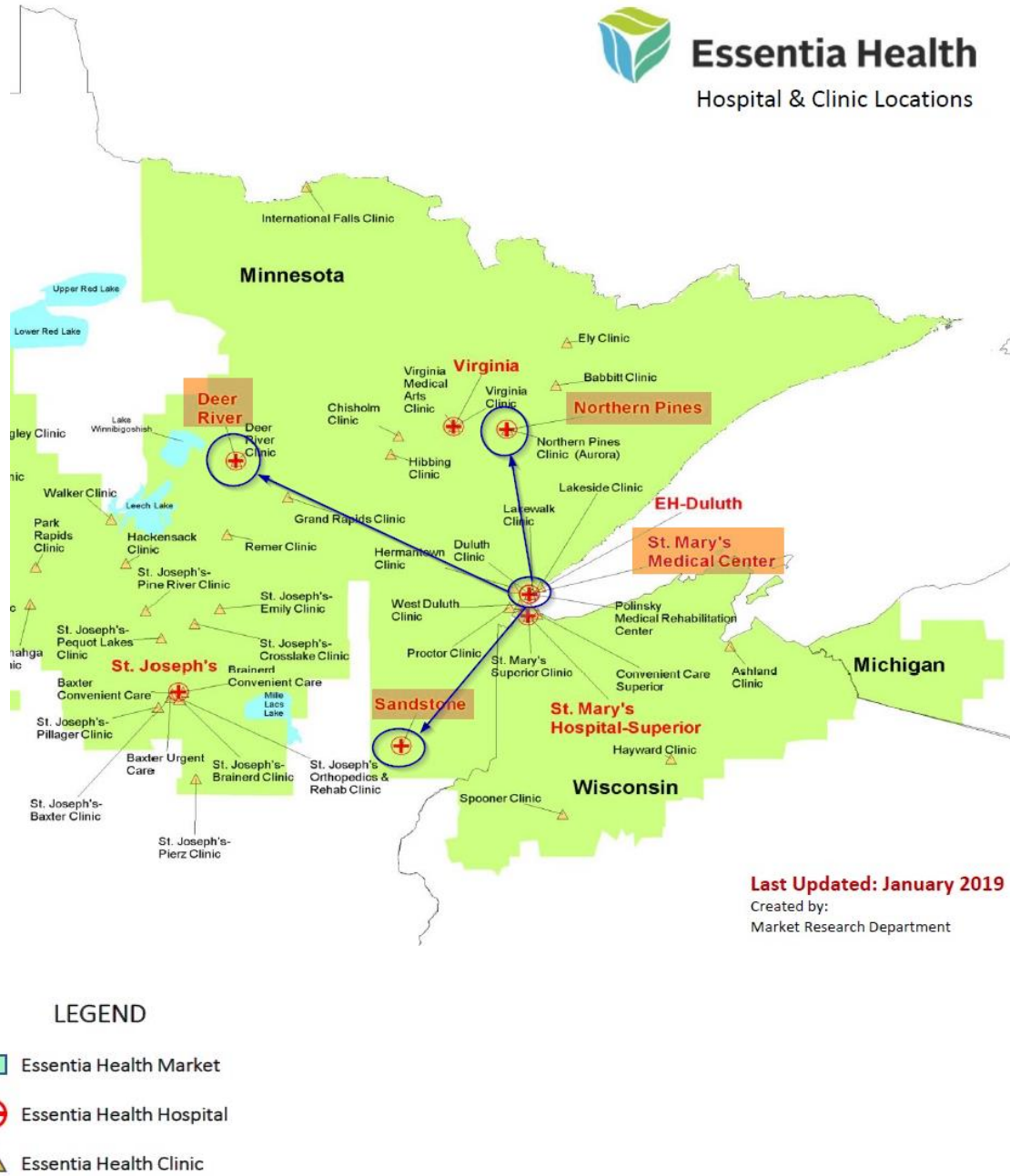


Figure 2. Essentia Health Hub-and-Spoke Telehospitalist Model

Discussion

Implementation of a new dedicated hospitalist medical staffing model requires significant planning and preparation. Hospitals that have operated under a primary care provider model experience a culture change when moving to a hospitalist model. Incorporating telehealth is a further paradigm shift for CAH staff and patients. Strong, supportive leadership and active change management is required to successfully implement a telehospitalist program. Leadership must also ensure all bylaws, rules and regulations are followed when implementing a new model. Recruitment of APPs may be necessary to implement the telehospitalist model on-site and a reporting structure for this team member needs to be established. Evaluation of information technology equipment and the internet network is vital to the success of the telehealth program. Careful consideration of all these necessary planning steps will allow implementation of a telehospitalist program at the CAH to provide high quality, cost effective hospital care close to home.

Implementation Plan- Essentia Health Telehospitalist Model

A leadership team of the hub operations administrator, hub hospitalist operations manager, hub hospitalist physician leaders, CAH medical director, telehealth program manager, CAH director of nursing, and CAH hospital administrator began to meet on a bi-weekly basis six months before an anticipated go-live with the telehospitalist model to work through a comprehensive action plan to ensure all necessary details were addressed to successfully implement the program.

Marketing. Internal marketing and education began in preparation for a shift to the telehospitalist model with the CAH hospital care team members, the hub hospitalist team, and leadership in both sites. Hospitalist team members at the hub site were concerned with not being

able to physically examine their patients and the liability this may cause. Research was presented at several lunch and learn sessions to educate the team on the success of the model in other organizations. Physician and provider services provided a session on responsibility and liability of supervising advanced practitioners to educate the team and help calm concerns.

External marketing for the patients and community was done through posters welcoming the new advanced practitioners to the CAH site and a media release to local newspapers informing the public of the change to the telehospitalist model. Because this was not a paid advertisement, the local papers could publish the media release at their discretion and unfortunately in one community the media release did not get published in any local newspapers. If an organization felt strongly about the external marketing, a paid advertisement could be purchased in local media outlets.

Business management. The telehospitalist program was required to run through the Essentia Business and Transaction Committee (EBTC) to ensure all necessary business items were in place prior to beginning the new model. A new accounting unit (AU) was required to be built at the CAH for a hospitalist department. Once the AU was built, documentation templates, order sets, a charge master, and a printing network could be built within the EPIC electronic medical record (EMR).

The telehospitalist model was also reviewed by a Telehealth Committee to review all federal, state, local laws, rules and regulations were being followed with the new model. Hospital bylaws were reviewed to ensure an APP could practice in each CAH. Ad hoc members were pulled into the planning meetings as needed to address items such as billing, documentation and reimbursement to confirm compliance with necessary rules and regulations. APPs and physicians underwent a privileging, credentialing and payor enrollment process for each CAH.

Recruitment & staffing. Recruitment for APPs for the rural CAHs commenced twelve months prior to implementation. An intense hospitalist training and mentorship was completed at the hub site prior to moving to the CAH. The length of this training & mentorship was dependent on the APP's level of prior experience. Recruitment of additional physicians to staff a 24/7 telehospitalist model also began twelve months prior to implementation. The model began during the day, due to the inability to recruit enough physicians to staff the telehospitalist model at night as well.

Technology & training. The telehealth team provided training at noon lunch hour learning sessions for the telehospitalist physicians at the hub site to see the telecart and try out the instruments. This same training was provided at the CAH spoke sites to educate the nursing staff and APPs. Unanticipated technology failures arose after the implementation of the telehospitalist model, including instrument failure and a poor WIFI signal. Equipment was replaced and WIFI boosters installed in the CAHs to improve the effectiveness of the telehospitalist exam.

Workflow for the communication and handoff process between the CAH APP and the hub telehospitalist physician was designed by the telehospitalist leadership team. This workflow included documentation and billing workflows to comply with all necessary regulations. This workflow was rolled out to the APPs and Telehospitalist via email communications, virtual huddles and section meetings as this go-live coincided with the COVID-19 pandemic. In-person meetings were prohibited due to hospital policy to keep everyone socially distanced during this time.

The leadership team visited each CAH site to meet the local hospital care team and local leadership and answer any questions they may have had. The goal of the in-person visits prior to

go-live was to build relationships and teamwork across the larger integrated health system team. A virtual pre-implementation retreat was held to ensure all last-minute details were completed and the model was ready to implement. Post-implementation meetings were also held to address any issues that could not be anticipated.

Managing Resistance to Change

A Lewin's Force Field Analysis is one tool that can be used to determine the feasibility of implementing a telehospitalist model (Lewin, 1951). If forces for the change to the new model are greater than forces for maintaining the status quo, then change can occur (Anderson, 2017). Identifying areas of resistance to change can also help hospital leadership lead change by working to reduce barriers.

The barrier of loss of local autonomy can be reduced by including local stake holders in the planning process and establishing good lines of communication throughout the planning and implementation process. Local leaders and care providers know their team, patients and community's needs best. By including stake holders in the creation of the telehospitalist program, this resistance is minimized. Education and practice with the telehealth equipment prior to go-live can help reduce the resistance of technology adoption. As care team members feel more comfortable and see the value of the technology, resistance to change will be minimized. Developing positive scripting describing the technology and the telehospitalist model to be used by the APP or nurse running the telehealth equipment is one way to reduce the resistance of technology adoption with patients. Finally, loss of care continuity is a reality, however, excellent hand off communication between the hospitalist APP, telehospitalist and the PCP can help patients feel confident in their care team's collaborative care delivery and embrace the new model.

The forces for implementing the telehospitalist model at Essentia Health's CAHs were greater than the forces against. Because a business cannot sustain itself if an operating margin is not realized, economic forces also carry greater weight in this analysis. Previous research supports the forces for the telehospitalist model and dispels the perceived barriers that were identified in this model of hospital care delivery (see Figure 3).

Metrics to Measure Success

Evaluating the effectiveness of implementing a new telehealth program is an important step in the change management process. Objective measurements help leadership identify areas of program success and areas where adjustments still need to be made to create a sustainable program. Metrics help team members understand the impact of the program on their patients and the organization. The leadership team at Essentia Health identified the following metrics to track the telehospitalist program impact:

- Patient volumes at CAH
- CAH Readmission rates
- CAH Mortality rates
- CAH Patient satisfaction scores
- Hub-and spoke Provider/Staff satisfaction
- Communication frequency between hub and spoke
- Operating margin at CAH

Future Research

This paper describes the integration of hospitalist services via telehealth across an integrated network of hospitals. Previous research supports this model of hospital medicine delivery to improve the cost effectiveness of care and improve recruitment and retention of local

primary care physicians. Because this is relatively young model, longitudinal research looking at patient outcomes are not yet available. Future research might include the long-term impact of this model on patient outcomes. A significant motivator for implementing the telehospitalist model is to improve the cost effectiveness of hospital care delivery to save rural hospitals from closing. Research looking at hospital and clinic closure rates between rural hospitals that use the telehealth model versus a traditional primary care model coverage would further help support or refute the adoption of the telehospitalist model.

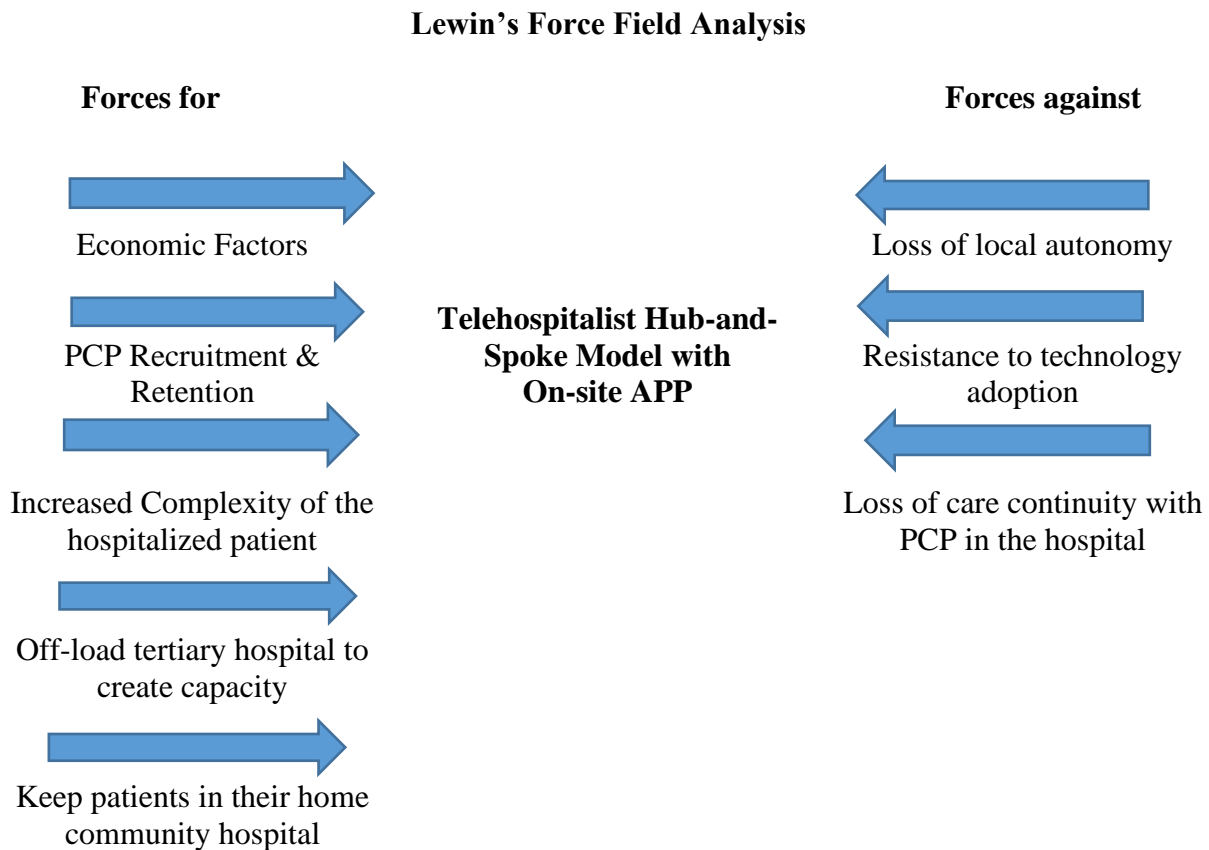


Figure 3. Forces for and against the telehospitalist hub-and-spoke model with an on-site APP

Conclusions

Telehealth is rapidly expanding across rural America, especially in light of the COVID-19 pandemic of 2020. Telehealth expands the reach of specialists to small rural hospitals helping to improve the quality of care delivered close to home. The telehospitalist model allows physicians and providers with expertise in hospital medicine to deliver care in rural community hospitals. The telehospitalist model also allows for dedicated physician and providers to respond quickly to changes in patient condition in comparison to the primary care model where physicians juggle clinic schedules between rounding on hospital patients. The telehospitalist model has been shown to reduce physician expense when an APP is on-site at the rural hospital and collaborates with a physician at a virtual hub who is supporting multiple hospitals. The telehospitalist model has also shown to improve PCP job satisfaction by eliminating the hospital call burden and allowing physicians to focus on their clinic practice.

Several models exist to meet the telehospitalist needs of rural hospitals. If a rural hospital is a part of an integrated health system, a hub-and-spoke model can be implemented to standardize processes and align program goals with organizational values and strategy. This innovative care delivery model is a paradigm shift away from total care from a family doctor. Making this culture shift takes considerable change management and strong leadership. Rural hospitals are faced with making radical changes to the status quo in order to keep their doors open to serve the rural communities in which they are located. The telehospitalist model is one way to improve the value of rural hospital care by increasing the quality of care at a lower cost than a traditional PCP model. By integrating the services across a network of health care, the patient can receive the right care at the right place at the right time.

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