

INNOVATIONS IN CLINICAL PRACTICE

The Virtual Hospitalist: a Critical Innovation During the COVID-19 Crisis

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A virtual hospitalist program expanded our ability to confront the challenges of the COVID-19 crisis at the epicenter of the pandemic in New York City. In concert with on-site hospitalists and redeployed physicians, virtual hospitalists aimed to expand capacity while maintaining high-quality care and communication. The program addressed multiple challenges created by our first COVID-19 surge: high patient census and acuity; limitations of and due to personal protective equipment; increased communication needs due to visitor restrictions and the uncertain nature of the novel disease, and limitations to in-person work for some physicians. The program created a mechanism to train and support new hospitalists and provide and expand palliative care services. We describe how our virtual hospitalist program operated during our COVID-19 surge in April and May 2020 and reflect on potential roles of virtual hospitalists after the COVID-19 crisis passes.

KEY WORDS: COVID; telemedicine; hospitalist.

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INTRODUCTION

In March and April 2020, New York Presbyterian Weill Cornell Medical Center and Lower Manhattan Hospital admitted over 1100 patients with COVID-19.¹ Intensive Care Unit (ICU) beds more than doubled during this time. This unprecedented escalation in demand for high-acuity clinical care was complicated by patient isolation, fear of contagion, scarcity of personal protective equipment (PPE), and the rapidity and unpredictability of patient deterioration. Several hospitalists were eager to help with patient care but limited by personal health status including pregnancy, comorbidities, quarantine due to COVID exposure, or recovery from illness.

Prior to the pandemic, different telehealth models had been described in the hospital setting. In one, remote clinicians replace in-person clinicians to care for inpatients at under-resourced Critical Access Hospitals.² While efficient in use

of personnel where local resources are scarce, this model raises concerns about a perceived compromise in the quality of care. A second model of collaborative care has precedent in the ICU setting (“tele-ICU”), where virtual intensivists work together with in-person non-intensivist providers. This has been shown to improve ICU mortality and reduce length of stay.³ However, given the need for more providers, this model comes at a financial cost, unless it allows for the care of significantly more patients. As our COVID numbers increased and telemedicine was increasingly utilized for outpatients,⁴ we queried whether hospitalists working virtually could help address the challenges we faced.

PROGRAM DESCRIPTION

The initial impulse of any healthcare professional when confronted with a health disaster like the COVID-19 pandemic is to rush to help: “all hands on deck!” This urge is especially strong for hospitalists and intensivists whose clinical skills are aligned with immediate needs. Although natural and laudable, this approach can fail. We learned from the devastation in northern Italy in February and March 2020 that the epidemic can overwhelm hardworking and well-intentioned physicians through clinical volume and acuity, in addition to depleting the workforce through illness and fatigue.

In response, we assigned 15 experienced hospitalists to work virtually. Our novel model of virtual inpatient care adapted elements from both inpatient telemedicine models described above. Among virtual hospitalists were physicians unable to provide on-site care due to quarantine, convalescence, or other health conditions. All were experienced hospitalists with at least two years as attendings, but all hospitalists and our section were new to telemedicine. During the COVID surge, our hospitalist schedule was constantly re-configured to meet rapidly changing clinical needs. The virtual and on-site hospitalist schedules were created in parallel to maximize efficiency. To improve continuity of care for patients, we staggered switch dates of on-site and virtual hospitalists. Hospitalists working virtually also formed a redeployment task force to recruit, train, and support non-hospitalist physicians who were instrumental in caring for inpatients with COVID-19.

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For our program, we borrowed principles from pair programming, an established practice in software engineering in which a dyad of programmers works together, one person on the keyboard and one communicating code. This model is used to train programmers and has been shown to reduce errors in software by 15%, with improved job satisfaction.⁵ Most virtual hospitalists collaborated with an on-site clinician as a dyad—splitting and pairing tasks to maximize both efficiency and quality of care. Splitting refers to “dividing and conquering” tasks, while pairing can be thought of as “two sets of eyes.”

We trained virtual hospitalists practicing remotely to partner with on-site clinicians, including experienced hospitalists, redeployed physicians, and advanced practice providers (APPs) to provide care in a variety of roles (see Table 1). The virtual hospitalists participated in rounds via a cell phone or tablet in the on-site clinician’s pocket under a protective gown. Virtual hospitalists remotely reviewed medications, laboratory results,

and vital signs and helped plan and execute clinical care. They focused on communication with patients and families as well as training of new hospitalists. For new admissions, the virtual hospitalist would collect history from the patient and family via phone or video and chart review, perform medication reconciliation, draft an admission note, and provide education and counseling to the patient and the family. The on-site hospitalist was left only to perform a physical exam, therefore limiting exposure at the bedside. We developed workflows to standardize the responsibilities of virtual hospitalists (see Appendix).

Prior to COVID-19, a typical team on our Physician Assistant (PA) service included one hospitalist and 1–2 PAs caring up to 15 patients. During the COVID surge, we piloted several models, including (1) a “mega-team” with one virtual hospitalist paired with one on-site hospitalist and two PAs with capacity for twice the census of other teams, (2) a shared virtualist model with one virtual hospitalist supporting 2–3 on-site teams co-led by redeployed, non-hospitalist

Table 1 Virtual Hospitalists’ Tasks and Their Value During COVID-19 Crisis

Virtual hospitalist task	Paired, split, or both?*	Value during COVID crisis	Future value beyond COVID?
Onboarding, faculty development, and peer support Train and support non-hospitalist physicians to be COVID-19 hospitalists	Split	<ul style="list-style-type: none"> Allowed rapid onboarding and training Minimized use of PPE and exposure of trainers Allowed flexibility for one virtual hospitalist to support multiple redeployed physicians 	<ul style="list-style-type: none"> Faculty development Onboarding new faculty Clinical support when special knowledge or skills are needed
Offer faculty development and support to colleagues	Split	<ul style="list-style-type: none"> Developed and disseminated COVIDTalk curriculum 	<ul style="list-style-type: none"> Virtual delivery of continuing education Psychosocial support and peer mentoring
Clinical care Round with on-site hospitalist on speakerphone or tablet	Paired	<ul style="list-style-type: none"> Accessed patient data, orders, guidelines in real time 	<ul style="list-style-type: none"> Ongoing Professional Practice Evaluation
Write notes, call consults, assist with discharge planning	Split	<ul style="list-style-type: none"> Wrote notes and performed tasks while on-site staff attended to critically ill patients 	<ul style="list-style-type: none"> Flexible work models with option for work-from-home for hospitalists
Provide clinical decision support	Paired	<ul style="list-style-type: none"> Discussed diagnosis, therapeutics and reviewed updated guidelines for anticoagulation, COVID therapies on rounds 	<ul style="list-style-type: none"> Faculty development Ongoing Professional Practice Evaluation
Assist with new admissions	Split and Paired	<ul style="list-style-type: none"> Completed chart review, called patient and family to obtain history, and drafted admission note Shared in creation of plan of care 	<ul style="list-style-type: none"> Virtual “swing shift” to prep admissions during busy late afternoon and early evening admission surge
Communication support Lead goals of care (GOC) conversations	Split	<ul style="list-style-type: none"> Led conversations with patients and families on admission and urgently in setting of rapid and unpredictable clinical decline. 	<ul style="list-style-type: none"> Communication training for all hospitalists
Provide frequent, high-quality clinical updates to patients and families	Split	<ul style="list-style-type: none"> Interacted with patients via tablet without the need for a mask Answered family questions without risk of interruption 	<ul style="list-style-type: none"> Ongoing role given anticipated limitations in hospital visitors and travel for the foreseeable future
Provide end-of-life care and bereavement support	Split	<ul style="list-style-type: none"> Staffed inpatient palliative care unit and bereavement program 	<ul style="list-style-type: none"> Ongoing provision of primary palliative care by hospitalists
Expanding job description of hospitalists Participate in post-discharge follow-up program	Split	<ul style="list-style-type: none"> Fielded questions from patients after discharge Provided care for patients who had difficulty accessing primary care during peak of pandemic 	<ul style="list-style-type: none"> Piloting incorporating virtual hospitalists in inpatient-outpatient transitions of care

*Paired = virtual hospitalist working on same task, usually at same time, as on-site physician. Split = virtual hospitalist is dividing the tasks with an on-site hospitalist

physicians, and (3) a virtual hospitalist as the attending of record working with on-site APPs caring for clinically improving patients. As new needs arose, virtual hospitalists filled additional roles including performing patient triage, conducting urgent goals of care conversations, co-leading expanded hospice and palliative care services, and providing patient advice through post-discharge follow-up programs.

The Role of Virtual Hospitalists in Ensuring Quality Clinical Care

Virtual hospitalists ensured high quality of care during the COVID-19 crisis in two important ways. First, when paired with redeployed physicians temporarily working in hospital medicine, virtual hospitalists provided clinical expertise in general medicine including diagnostic reasoning, treatment planning, advice around escalation of care, and assistance with discharge planning. Second, virtual hospitalists working with on-site experienced hospitalists shared or divided tasks such as writing notes, submitting bills, communicating with families and consultants, reviewing the literature, and monitoring patients' clinical course. This allowed on-site hospitalists to manage larger numbers of high-acuity patients, focus their attention on patient assessment and clinical reasoning, and spend less time on documentation. The virtual hospitalists were responsible for staying up-to-date with rapidly changing hospital protocols and national guidelines for care of patients with COVID-19 and could reference the most updated guidelines in real-time as their colleagues were at the bedside rounding.

Many admitted patients improved and were discharged home. Because of uncertainty about the clinical course of COVID-19, virtual hospitalists assumed responsibility for post-discharge follow-up. In a newly created program, a team of nurses and APPs called patients by phone at several intervals after discharge and escalated concerns to virtual hospitalists. The hospitalists assessed the patients remotely and addressed needs, such as sending new prescriptions or referring back to the emergency department.

The Role of Virtual Hospitalists as Providers of Primary Palliative Care

The need for timely, expertly conducted advance care planning discussions was critical during the COVID-19 surge.⁶ Given frequent cases of rapid respiratory failure, our hospital medicine section set a new expectation that code status had to be confirmed with all patients or their families within 1 h of admission. Our expert palliative care teams were met with enormous demand for their services, especially in the ICUs. With needs exceeding available specialists, hospitalists needed to provide primary palliative care. Virtual hospitalists developed and taught COVIDTalk, an advanced communication skills training program adapted from VitalTalk, a national organization that trains clinicians in skills to facilitate goal-concordant end-of-life care.⁷ Virtual hospitalists were among over 100 providers trained in COVIDTalk during the surge. While an on-site hospitalist

examined a newly admitted patient lacking the capacity to determine code status, their virtual counterpart used skills from COVIDTalk to simultaneously discuss goals of care with family members by phone. As clinical acuity escalated, virtual hospitalists could build on the relationship established with the patients' family on admission to make additional decisions together.

Virtual hospitalists also participated in three new palliative care-led initiatives at our hospital. First, the Rapid Response-Goals of Care Team, staffed jointly by virtual hospitalists and palliative care providers, was available 24 h per day to provide support to primary teams when urgent goals of care conversations were required. Second, virtual hospitalists served as the on-call physician for APPs working overnight on a new multidisciplinary COVID-19 Palliative Care and Hospice Unit. Third, virtual hospitalists helped launch a virtual bereavement service which offered longitudinal support for families grieving a loved one lost due to COVID-19.

The Role of Virtual Hospitalists to Meet the Communication Needs of Patients and Families

Loneliness, despair, and fear were common emotions for patients hospitalized in isolation with COVID-19. Visitors were restricted from our hospitals, with few exceptions. Efforts to conserve PPE also reduced visits by clinical staff. When visits did occur, they were brief, with limited human touch, faces camouflaged by masks. Virtual hospitalists addressed these deficits in human contact with phone and video visits with patients without the hindrance of PPE, fear of contagion, or need for haste. Our hospitalists found that patients' families, unable to visit their loved ones in the hospital, craved more communication with our teams than before the pandemic. They had many questions about our rapidly evolving understanding of prognosis, clinical trajectory, treatment options, and needs for quarantine and contact tracing. Virtual hospitalists dedicated a significant amount of time ensuring thorough communication with families, logging a daily median of 105 minutes on the phone with families, with some days up to 540 minutes. On-site hospitalists were stretched thin while caring for critically ill patients on medical floors; virtual hospitalists had more time to spend on the phone with families and could provide synchronized updates while on-site hospitalists performed bedside assessments. On-site hospitalists reported that working with virtual hospitalists allowed them to perform critical care without sacrificing communication and felt that their patients and families received more attention and support than what they could have provided alone. Patients, families, and providers commented on the therapeutic value of seeing a smiling face and hearing the reassuring words of an unhurried and unmasked virtual hospitalist on a tablet.

DISCUSSION AND FUTURE DIRECTIONS

Our unique model paired virtual hospitalists with on-site clinicians to expand the bandwidth of inpatient teams, part of a

growing movement to explore inpatient telemedicine during COVID-19.⁸ As our census declined from its peak during the first surge, we continued to adapt the role of the virtual hospitalist to meet new needs, such as providing virtual support to our new COVID-19 Recovery Unit and assisting with new admissions during peak hours.

The virtual hospitalist program was designed to expand our human capital by leveraging the capacity of physicians who could only be deployed remotely due to limitations to in-person work. Furthermore, the virtual hospitalists added flexibility to our system, filling new roles and offloading extra responsibilities that arose. While it may seem redundant to have two hospitalists staffing one team, efficiency was recaptured in three ways: (1) expanded team censuses, (2) hospitalists supporting redeployed physicians who expanded our workforce, and (3) the creation of team staffed only by a virtual attending working with on-site APPs. Some on-site clinicians noted that a virtual partner helped offload not only clinical burden but also burnout and loneliness associated with the grueling work during the pandemic.

We collected data to guide continuous improvement of our program, and not for research. The majority of the virtual hospitalist shifts were filled by physicians with limitations to on-site work. Had virtual work not been available, some of these physicians may have taken leave. Therefore, it is difficult to quantify the financial costs of this program. Future research is needed to measure whether quality of care, patient experience, or clinical outcomes would have been different without the virtual hospitalists' support.

Learning from our experience during the early COVID-19 surge, we are exploring the role of hospitalists working remotely in faculty development, peer support, care for complex outpatients at home or nursing facilities, and as a mechanism for disaster relief to support other hospitals within and beyond our system. We are in the process of launching an interinstitutional network to ensure that access to resources, including guides for innovative care models to manage similar crises, is readily accessible to hospitals and frontline providers worldwide. With more time for advance planning and study design, we plan to assess future iterations of virtual hospitalist programs with a rigorous analysis of costs and measurement of outcomes to assess value to the system.

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Declarations:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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