

Hospital Care for COVID-19: What Have We Learned?

When COVID-19 struck Washington state in January 2020, most U.S. hospitals were unprepared. In March, the pandemic arrived in the New York metropolitan area, overwhelming hospitals¹ and causing significant mortality,^{2,3} particularly in older adults. This experience continues in U.S. hospitals despite accumulating experience, research, and governmental support.⁴ Emergency operations plans,^{5,6} required for hospitals, may be insufficient for COVID-19. Challenges and successful interventions must be shared to improve outcomes. This editorial describes how one system, Hackensack Meridian Health (HMH), in New Jersey, one of the early and hardest hit states, developed a comprehensive plan, the *COVID 2.0 Playbook*,⁷ for the future.

COVID-19 is devastating for older adults. Their hospitalization risk is eight-fold higher at the age of 75 to 84 years compared with 18 to 29 years, 13-fold higher for age 85 years and older, with a horrifying 220-fold higher mortality rate for ages 75 to 84 years, and 630-fold for age 85 years and older.⁸ COVID-19 amplifies hazards of hospitalization for older adults:⁹ functional decline, delirium, polypharmacy, sleep disturbance, falls, weight loss, pressure injury, and infection. Some evidence-based interventions, such as Acute Care for Elders units,¹⁰ comprehensive geriatric consultation,¹¹ the Hospital Elder Life Program,¹² and Institute for Healthcare Improvement's *Age-Friendly Health System* recommendations,¹³ were suspended during the pandemic due to staffing.

On March 2, 2020, the first COVID-19 patient was admitted to HMH's university hospital.¹⁴ HMH mandated universal masking and testing of long-term care frontline workers before Health Department requirements. Within 6 weeks, confirmed COVID-19 cases at HMH peaked at 7,069 patients (5,109 hospitalized). HMH has now cared

for greater than 13,000 COVID-19 patients (Figure 1), including many older adults. The human and financial toll has been immense.

During this local pandemic nadir, team members from HMH's 17 hospitals, 16 post-acute care facilities, 500+ ambulatory offices, home care, hospice, dialysis, and the Hackensack Meridian School of Medicine contributed challenges and innovations (examples in Table 1). The *Playbook* outlines future system actions across settings, facility and capacity management, infection control, safety, administration, human resources, clinical management, laboratory, pharmacy, patient experience, research, ethics, and supply chain.

HMH's Clinical Disease Management team led patient care, disease transmission prevention, and analytics, monitoring emerging literature, troubleshooting problems, and sharing best practices and policies in real time. Infection prevention collaborated with purchasing and materials management to acquire, distribute, and maintain personal protective equipment (PPE) supplies. Extensive COVID-19 clinical guidelines were developed and disseminated, with continuing updates. Local experience included a March recommendation for steroid treatment for patients with COVID-19 inflammatory respiratory failure, long before published data. Guidelines included advance directive, state law changes, and treatment and imaging recommendations, among others.

Hospital surge staffing is challenging. At the university hospital, more than 100 physicians were redeployed from ambulatory practice to assist during the surge. The Department of Medicine provided just-in-time clinical training, including hypoxia management, off-label medication use, clinical trial eligibility, an electronic medical record refresher, and training for PPE use. Experienced physicians

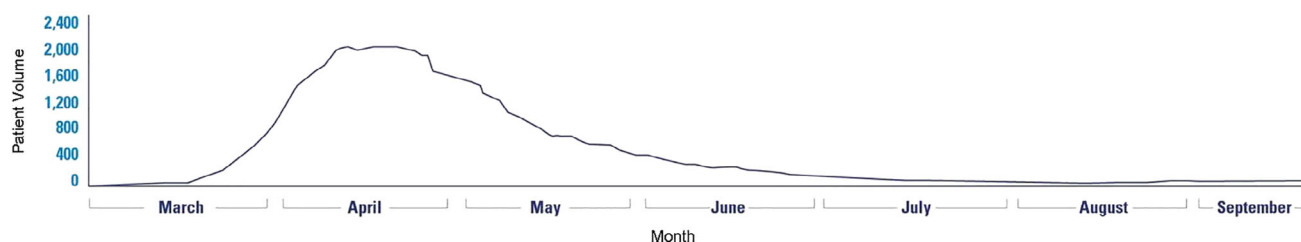


Figure 1. Hackensack Meridian Network Covid-19 hospitalization volume, March to September 2020.

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Table 1. Selected COVID 2.0 Playbook Challenges, Innovations, and Future Preparedness Plans

Challenges	Innovations	Preparedness plans
Clinical Disease Management		
Community MDs uncertain about referrals for admission, testing, treatment	MD education via live, internet-based webinars; Command Center internet information; e-mail blasts; chairperson's virtual meetings	Develop process for earlier preparation and command center activation based on analysis of admission rates and percentage positivity; earlier communication
Clinical treatment uncertainty	HMH Clinical Guidelines interdisciplinary team development; dissemination HMH School of Medicine students review and summarize new research for clinicians Expand clinical guidelines	Expand rounding in clinical locations Develop standing literature search functionality to inform guidelines and practice coaching program for infection prevention best practices
Clinical site inexperience	Partner new and experienced nurses and physicians	Improving online COVID-19 resource center for team members
Delays in discharge due to family and post-acute care infection concerns	Discharge NP to assist complex family, post-acute care issues	Simplify processes
Patients with hypoxia	Proning Service; clinical guidance on management	
Unusual pressure injury from proning	Additional clinical guidance on proning, pressure injury prevention	Conduct prediction models for local second COVID-19 and influenza surge
Complexity of admissions for redeployed physicians	Hospitalist admission workup for all COVID-19 patients; then assignment to ward teams	
Complex medical decision-making and methods of family communication	iPad use, family communication teams, increased patient visibility	
Infection prevention	Multidisciplinary workgroup review and response for team members, patients, family	Update protocols
Delirium	Increase patient visibility, case review, geriatrics consultation	Add training and guideline section for delirium protocols
Ethics		
Concern about allocation of resources	Rapidly developed HMH policy and infrastructure to adapt and implement state policy for Allocation of Critical Care Resources During a Public Health Emergency Partnered with Learning and Development to extend bioethics education to ensure fair allocation of resources Ensure that relevant policies are collaboratively developed provide COVID-19-relevant bioethics	Strengthen ethics education and training regarding clinical decision-making
Issues regarding advance directives	Temporary addendum Do Not Attempt Resuscitation policy to meet the unique demands of the pandemic. Adapt procedures for Do Not Attempt Resuscitation orders to meet the challenges of the pandemic	
Staff and physician anxiety, illness	Departmental support, institutional webinars, website information	Partner with Wellness to expand opportunities for moral distress debriefs for frontline providers
Research ethics: projects and enrollment	Bioethics participation in research committee to support, guide, and collaborate in COVID-19-related research protocol development	Incorporate learning in larger research ethics framework
Personal Protective Equipment		
Variability in PPE use	Infection prevention team assessment of PPE effectiveness Clinical Disease Management standardize protocols across settings, institutions, incorporate CDC guidance Staff/MD education by webinars, video, in-person PPE training hourly Network procurement, monitoring, distribution	Standing guidance, reassessments with types of infections (influenza, COVID-19) Stockpile critical PPE and supplies; enhance PPE education, oversight, and enforcement processes Standardizing local oversight of PPE distribution, management, and procurement Create a new Value Analysis Rapid Response Team to evaluate new sources of PPE

Abbreviations: HMH, Hackensack Meridian Health; MD, doctor of medicine; NP, nurse practitioner; PPE, personal protective equipment.

and nurses partnered with redeployed staff to support practice. Increased rounding, case discussions, and coaching to disseminate best practices are planned.

Despite a Hospital Elder Life Program, delirium presented with COVID-19, compounded by isolation. iPads were provided for communication. The 74-bed temporary COVID-19 unit was built with transparent walls, enabling rapid responses to alterations in status and providing a reassuring presence of nurses and physicians. Windows in hospital room doors were enlarged to achieve the same capability.

Serious illness conversations about goals of care, clinical trial risks and benefits, and advance directives were held with families by video call. With geriatrics and palliative care service support, clinicians' ability to hold these discussions improved rapidly. In intensive care units, a "Family Communication Team" of redeployed physicians provided telesupport for families. The physicians were grateful to participate "when it really counts."

HMH's research program contributed the first-approved COVID-19 test, reducing result wait times from days to hours. An HMH COVID Recovery Center started to address persistent symptoms and support research. The Hackensack Meridian *COVID-19 2.0 Playbook* is a leading example of rapid reflection and analysis needed by hospitals during COVID-19, which will improve care now and for a postpandemic future.

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