As the coronavirus pandemic descended on New York City, staff at NewYork-Presbyterian, a 10-campus academic health care system, quickly launched multiple large-scale planning efforts to address inpatient capacity, staffing needs, and equipment shortages during the Covid-19 crisis. And, as beds filled with Covid-19–positive patients, it became clear that there would be a substantial increase in Covid-19–specific discharge and post-acute needs. Importantly, those needs would shift over time, from an early focus on low-acuity patients requiring additional support at home to more severely impacted patients requiring prolonged post-acute ventilator and ventilator-dialysis care. To address this post-acute surge, leaders focused on developing several key areas: internal and external communication structures, Covid-19–specific capacity needs beyond the hospital, nontraditional post-discharge support, and iterative assessment and adjustment of post-acute needs.

In the first weeks of the pandemic, about 13% of all of NewYork-Presbyterian (NYP)’s Covid-19 patients required facility-level post-acute care on discharge and many more went home with a mix of home health care, supplemental oxygen, remote monitoring, and telephonic follow-up support. By the time of NYP’s Covid-19 peak in mid-April 2020, the system would discharge nearly 1,400 coronavirus patients in 1 week, and by late April nearly 30% of discharges required facility-level care. Anticipating the post-acute surge based on increasingly ill patients, in mid-March, leaders launched several efforts to increase post-acute capacity and facilitate rapid discharge of Covid-positive patients, including: building internal and external communication structures; supporting the creation of Covid-19–specific post-acute capacity; establishing nontraditional post-discharge support; and facilitating iterative sizing of the post-acute needs.
Protocols were established based on the health care needs of the patient and the location designated for post-acute care (Figure 1).

**FIGURE 1**

*Continuum of Post-Acute Care for Covid-Positive Patients*

Communication Structures

By March 23, NYP had a Covid-positive census of approximately 1,000 patients, and we had established a command-center structure for social work and care coordination directors across the system, which reported to the enterprise-wide Incident Command Center. Every morning, a post-acute team, including a subset of social work directors, a physician, the administrator of NYP’s owned skilled nursing facility (SNF), and post-acute project directors huddled virtually to discuss placement initiatives and problem-solve emerging discharge barriers. Additionally, all social work directors participated on a thrice-weekly call to resolve challenges and escalate urgent issues.

Critical updates about discharge options were shared during these structured meetings and were also circulated throughout the hospital using a dedicated Covid-19–specific intranet site. The post-acute team developed a resource guide listing all Covid-specific units at local SNFs, Covid-positive acceptance status and criteria for local post-acute providers, regulatory updates, and key contacts.

Beyond internal communications, we also increased communication with a subset of our post-acute partners. By mid-March, we realized that the existing scheduled meetings and calls were insufficient given the dynamic and novel nature of the crisis. In addition to conference calls and Web-meetings, we conducted capacity and capability surveys with more than 40 SNFs and home health agencies (HHAs) each week starting on March 18. To facilitate rapid response to these questionnaires, we found it useful for a staff member to hold a conference call with the post-acute provider.
Covid-19–Specific Post-Acute Capacity

We launched several efforts to increase post-acute capacity and provide clinical and administrative support to post-acute providers, so they could confidently care for Covid-positive populations. At the height of the pandemic, NewYork-Presbyterian supported the establishment of five Covid-SNF units with a combined total of more than 100 beds dedicated to our patients and provided equipment and training to local Home Health Agencies (Table 1).

Nontraditional Post-Discharge Support

NewYork-Presbyterian established several temporary placement options for Covid-positive patient populations that were particularly difficult to place. First, we partnered with a community-based organization to provide medical respite care and services for the homeless and individuals who could not immediately return home following discharge. NYP funded the program, which provided safe, medically supervised accommodations and social services at a local hotel. We also paid for temporary assisted living accommodations for patients who typically reside with an aide, in assisted living residences, or in group homes, and were unable to return home.

To understand and quantify the post-acute demand, we built a simple algorithm to predict post-acute discharge needs. The tool was designed to project Covid-19–related weekly demand for post-acute facility beds and home health needs from late March through mid-June 2020.”

Of course, for Covid-19 patients who could be safely discharged to home, we established support services to facilitate that option. A network of care providers — including medical students, medical assistants, care managers, nurses, and nurse practitioners — provided follow-up support to every discharged Covid-positive patient (including for those under our care at alternative care sites, such as the Javits Center Field Hospital and the USNS Comfort). Care managers typically assigned to our

Table 1. Hospital Support Provided for SNFs and HHAs

| Type of Support                                                                 | SNF | HHA |
|---------------------------------------------------------------------------------|-----|-----|
| Clear communication about the post-acute needs of Covid-positive patients        | ✓   | ✓   |
| Supplying personal protective equipment,* including more than 65,000 masks, gowns, and face shields (to non-owned facilities) | ✓   | ✓   |
| Supplying durable medical equipment, including pulse oximeters                   | ✓   | ✓   |
| Infection Prevention and Control education and training, including a nurse educator, videos, and documentation | ✓   | ✓   |
| Clinical criteria for stable, Covid-positive patients eligible for SNF or HHA services | ✓   | ✓   |
| Sample staffing models for a Covid-19 unit (See Appendix)                       | ✓   | ✓   |
| Sample clinical protocols for the management of Covid-positive patients (See Appendix) | ✓   | ✓   |
| Telehealth programs to support SNF providers                                     | ✓   | ✓   |
| Support from ACO Care Coordination team to connect with timely physician backup (many ambulatory care physicians had been redeployed) | ✓   | ✓   |
| Support and advice from hospital leadership                                      | ✓   | ✓   |

*While still ensuring that NewYork-Presbyterian had sufficient supplies. NewYork-Presbyterian also established two dedicated palliative care/hospice units within the hospital with 24 beds and established a centralized process for home hospice referrals. SNF = skilled nursing facility, HHA = home health agency, ACO = accountable care organization. Source: The authors.
Accountable Care Organization (ACO) population were enlisted to participate in discharge follow-up for Covid-positive patients, regardless of ACO attribution. Core elements of home discharge follow-up included:

- Each patient was contacted within 24 hours to assess status.
- Standardized protocol was established for symptom assessment and escalation.
- All patients were triaged to their primary care providers. For patients without a primary care provider, a connection was established with NewYork-Presbyterian’s Ambulatory Care Network, Medical Group, or with our medical school partners (ColumbiaDoctors or Weill Cornell Medicine) and remote follow-up protocol was initiated.
- Standardized clinical protocols were developed to assess the need for supplemental oxygen or remote monitoring.

### Sizing Post-Acute Needs

To understand and quantify the post-acute demand, we built a simple algorithm to predict post-acute discharge needs. The tool was designed to project Covid-19–related weekly demand for post-acute facility beds and home health needs from late March through mid-June 2020. NYP began to use the output from the tool on March 26 and continued to refine the outputs throughout April. Key elements of the tool included:

- Covid-positive admission forecast, by day and by severity
- Covid-positive patient profiles, including intensive care unit (ICU) utilization, length of stay, and mortality
- Covid-positive patient residence before admission, including the percentage of patients coming from post-acute facilities
- Covid-positive patient discharge disposition, including the percentage of patients requiring different levels of care, stratified by two inpatient severity groupings, ICU and med-surg

In the early stages of the pandemic, interviews with frontline clinicians helped to inform our assumptions, especially while limited data existed. Due to the tool’s sensitivity to the Covid-positive admit forecast and discharge need assumptions, it was routinely updated, and multiple scenarios tested, to identify the potential range of needs. We compared the tool’s predicted weekly discharge needs to a baseline of 2019 post-acute discharge needs to monitor and predict surge. The tool was used as an early indicator of future post-acute needs — not to assess real-time discharge needs or challenges.

Ultimately, during the first 11 weeks of the pandemic, just over 20% of our Covid-positive patients were discharged to a post-acute facility, including skilled nursing facilities, inpatient
acute rehabilitation facilities, long-term acute care hospitals, or hospice; nearly 80% were discharged home, including a mix of patients with home health care, supplemental oxygen, remote monitoring, and telephonic follow-up support. Based on our projections, we were able to prepare our discharge staff and post-acute partners for the volume of Covid-positive patients. The mix of post-acute discharge needs for our Covid-positive patients changed over time, as the more complex patients (including ICU and ventilator patients) had longer lengths of stay in the hospital, and would ultimately have a substantially different discharge profile, with more patients requiring facility-level post-acute care, sub-acute rehab, inpatient rehab, or long-term ventilator care. During the first 6 weeks of the pandemic, only 13% of discharged patients were placed in facility-level care, and this percentage grew to 29% in the following 5 weeks (Table 2).

### Lessons Learned

**You can never over-communicate.** With great uncertainty and daily changes in realities, the implementation of routine communications and huddles with both internal and external stakeholders became critical. Beyond calls, we found periodic structured assessments of post-acute provider capabilities to be essential for our discharge planning staff. Further, clear communication to local post-acute providers about NewYork-Presbyterian’s needs and advance notice about the clinical profile of Covid-positive patients helped to ensure that post-acute capacity was ready when we needed it. This communication also helped us identify which post-acute facilities would be able to launch Covid-specific solutions (such as dedicated SNF units).

> These programs allowed us to manage the length of stay for our Covid-positive population and ensure that we maintained sufficient inpatient capacity for future Covid-positive patients."

**Pre-pandemic discharge challenges will become exacerbated in a crisis.** NYP has always had challenges placing certain patient populations — including homeless, behavioral health patients, persons with developmental disabilities, and others. Special, customized solutions had to be developed to ensure that those Covid-positive populations received appropriate placement ASAP. Frequently, there was a cost associated with those solutions, which was offset by the benefit of opening inpatient capacity; but a full retrospective financial analysis is yet to be completed.

**We need to proactively help local post-acute providers with emergency preparedness.** NYP is a large health system, with substantial resources — including a team of infection prevention and control clinicians, strategic sourcing and procurement professionals, and emergency
management experts. The local nursing homes and home health agencies that we partner with, many of which are small not-for-profits, are often run with a slim management team and lack the robust resources necessary to respond to the pandemic. Through early and proactive engagement, we were able to help these providers identify and solve many problems.

**Nontraditional support for patients discharged to home allowed for expedited discharge.** While securing post-acute facility capacity and home health capabilities was essential, many Covid-positive patients were discharged directly home. We implemented a range of support programs to facilitate discharge home, including remote monitoring, oxygen support, and universal follow-up with Covid-specific protocols. These programs allowed us to manage the length of stay for our Covid-positive population and ensure that we maintained sufficient inpatient capacity for future Covid-positive patients. This additional follow-up support was especially critical considering the unknown nature of the disease.

**Looking Ahead**

As we move beyond the first wave of the pandemic, we are carefully assessing our interventions — the internal process improvement efforts implemented, the new post-acute capacity, and the discharge support protocols developed — to evaluate efficacy and determine what modifications, if any, are needed. This retrospective review will consider our ability to maintain inpatient capacity during a surge, as well as quality outcomes for discharged patients, such as 7-, 14-, and 30-day readmissions, post-discharge mortality, and subsequent successful discharge to the community.

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*Basic Staffing Model Recommended for Covid-Positive SNF Units and Sample of Clinical Guidance for the Management of Covid-Positive Patients in a Skilled Nursing Facility*
Acknowledgments

The authors would like to acknowledge the following for their contributions to both this initiative and article: Mark Levey, MBA, RT(T), Project Manager, Care Coordination, NewYork-Presbyterian Healthcare System; Natasha Elie-Louissaint, RN, MPA, Vice President and Chief Operating Officer, Silvercrest Center for Nursing and Rehabilitation, NewYork-Presbyterian Healthcare System; Emme Deland, MBA, Senior Vice President, Chief Strategy Officer, NewYork-Presbyterian Healthcare System; Paul N. Casale, MD, MPH, Executive Director, NY Quality Care and VP, Population Health Administration, NewYork-Presbyterian Healthcare System; Karen Westervelt, MHCDS, Group SVP and COO, Regional Hospital Network, NewYork-Presbyterian Healthcare System.

Disclosures: Amelia Shapiro, Nancy O’Toole, Donna Tinling-Solages, Timothy McGarvey, Michael Tretola, and Paul Dunphey have nothing to disclose.