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SPECIAL COMMUNICATION

Effect of the COVID-19 Pandemic on Postacute Care <a>Decision Making



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Abstract

The response to the coronavirus disease 2019 (COVID-19) pandemic in the United States has resulted in rapid modifications in the delivery of health care. Key among them has been surge preparation to increase both acute care hospital availability and staffing while using state and federal waivers to provide appropriate and efficient delivery of care. As a large health system in New York City, the epicenter of the pandemic in the United States, we were faced with these challenges early on, including the need to rapidly transition patients from acute care beds to provide bed capacity for the acute care hospitals. Rehabilitation medicine has always played an essential role in the continuum of care, establishing functional goals while identifying patients for postacute care planning. During this crisis, this expertise and the overwhelming need to adapt and facilitate patient transitions resulted in a collaborative process to efficiently assess patients for postacute care needs. We worked closely with our skilled nursing facility, home care partners, and an acute inpatient rehabilitation hospital to adapt their admissions processes to the patient population with COVID-19, all the while grappling with varying access to vital supplies, testing, and manpower. As the patient criteria were established, rapid pathways were created to postacute care, and we were able to create much needed bed capacity in our acute care hospitals.

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When a pandemic strikes and has the potential to overwhelm hospitals with a large volume of very ill patients, in addition to increasing bed capacity, it is crucial to manage patient throughput to maintain control of the inpatient census and efficiently use hospital resources. The coronavirus disease 2019 (COVID-19) crisis in the United States presented just this type of challenge. Since the first case of COVID-19 presented to a New York area hospital on March 1, 2020,¹ medical centers in the Tristate (New York, Connecticut, New Jersey) region began implementing their surge preparation plans to increase bed capacity and staffing and created new work flows to manage the influx of patients. The Montefiore Health System (MHS) consists of 11 acute care hospitals and 1 freestanding rehabilitation hospital. All facilities are located in Bronx County of New York City and in Westchester,

Disclosures: Dr Bartels is on the EHE Health medical advisory board and advises on cardiac wellness and exercise; advises the implementation of outpatient and inpatient cardiac and general rehabilitation in China, for LIH Medical, Beijing; Apostherapy Inc funds research of biomechanical alteration of gait through provision of free devices for back pain and urinary incontinence studies; receives funds and the support of research fellows in the Department of Rehabilitation Medicine, from the Everest Foundation. The other authors have nothing to disclose. Orange, and Rockland counties in the lower Hudson Valley of New York State. In response to the onset of the pandemic and in anticipation of a widespread local and national bed shortage, New York State Governor Andrew Cuomo declared a health emergency on March 23, 2020, and issued New York State Executive Order No. 202.10 ("EO 202.10"). This executive order established directives for hospitals in New York State to ensure sufficient bed capacity and to eliminate obstacles to patient care. In response, MHS immediately executed surge plans to increase bed capacity by up to 150% to meet the anticipated needs of COVID-19positive patients requiring hospitalization.^{2,3} As a part of this process and in collaboration with other departments, the Department of Rehabilitation Medicine of Montefiore Medical Center and Albert Einstein College of Medicine coordinated the transitions of care with our freestanding inpatient rehabilitation hospital, Burke Rehabilitation Hospital, Montefiore Home Care, and with our skilled nursing facility (SNF) partners. We did this to meet the increasing demands for acute care beds while facilitating safe discharges to appropriate settings as quickly as possible. Prior to the pandemic, the Department of Rehabilitation Medicine had played an important role in the movement of patients through the

postacute care continuum by helping to coordinate transitions of patients, and this expertise has proven invaluable during this health care crisis.⁴ In this article we present the challenges and opportunities involved in adapting to a pandemic surge as well as some of the operational considerations in moving patients throughout the continuum of acute and postacute care.

Issues and Challenges

Challenges to our rehabilitation service presented almost immediately with the surge of COVID-19 hospitalizations. In response, we redesigned the entire pathway of rehabilitation assessment, treatment, and postacute care planning (appendix 1). At the onset, an electronic consultation service was created to initially evaluate COVID-19-positive patients to preserve valuable personal protective equipment (PPE) and to enhance staff and patient safety. To determine potential rehabilitation needs on the general medical units, initial patient assessments were made remotely, using chart review, information gathered from medical teams, and nursing bedside functional assessments. The rehabilitation findings and recommendations were then documented in the electronic health record. As a part of this effort, standard early mobilization efforts in the intensive care unit (ICU) setting were suspended in favor of establishment of a proning program for ventilated patients in cooperation with critical care. The therapy staff was allocated to this vital task as ICU census surpassed 200%.

For transitions of care, we created a new set of screening criteria for postacute care with social work and the acute medical teams, which included both review of laboratory and respiratory care needs but also rapid social clearance. In a period of 2 weeks, we developed an efficient process for rehabilitation assessment and postacute care management of patients with COVID-19. Pathways were established from acute care with our discharge partners (inpatient rehabilitation facilities [IRFs], SNFs, Montefiore Home Care) to more efficiently free up hospital beds to accommodate incoming COVID-19–positive patients. Rapid electronic consults used these criteria and resulted in a new level of efficiency in patient disposition. A disposition process that required an average of several days pre-COVID-19, transitioned to one of several hours from initiation of assessment to assigning a disposition (fig 1).

Because of the urgent needs of the hospital system, many of our process changes occurred in parallel as we collaborated with other departments who were also adapting their evaluation and discharge processes to the rapidly evolving COVID-19 medical and logistical challenges. In particular, we worked with physicians within the Department of Medicine to explore pathways to safe discharge. This required the establishment of medical criteria including clinical status, laboratory trends, and functional status

List of abbreviations:

COVID-19	coronavirus disease 2019
ICU	intensive care unit
IRF	inpatient rehabilitation facility
MHS	Montefiore Health System
NYC	New York City
PPE	personal protective equipment
SNF	skilled nursing facility
USNS	United States Naval Ship

while considering the social determinants of health affecting our patients who were returning to the community.⁵ Bronx County is the borough of New York City (NYC) with the lowest income and presents many unique considerations for medically safe discharge not found in surrounding areas.^{6,7} Examples of the many social barriers include housing challenges, an inability to safely quarantine a discharged patient in a crowded, small, or multifamily dwelling; patient and family anxiety; language barriers; and financial constraints. We determined that COVID-19 survivors generally fell into several categories for discharge: (1) safe home discharge with or without services, (2) postacute care discharge (both to IRF and SNF settings, and (3) alternative discharge location (field hospitals, hospice, or other sites).

Some patients with COVID-19 could be safely discharged to home without services. These patients were identified by clinical stability, determined by the emergency department for patients who did not require hospital admission and by physicians on the inpatient units. These patients were discharged home and managed in the community with primary care physician and nursing follow-up every 24-48 hours via telehealth process. Guidance was provided for a self-directed home exercise program through the use of a home care manual created by our staff.⁸ This population had no functional limitations or had adequate family support available for assistance.

For patients who could not go home but might be managed safely in temporary hospital settings, our collaborative process included dialog to determine which patients would go to alternate discharge locations, including the Javits New York Medical Station, a 1000-bed emergency field hospital built by the Army Corps of Engineers at the Jacob Javits Convention Center, and the United States Naval Ship (USNS) Comfort, a 500-bed capacity naval hospital ship with ICU capacity.9 Both the USNS Comfort and the Javits New York Medical Station functioned as an integrated system within the NYC medical system, with the USNS Comfort able to manage high-severity COVID-19-positive patients and the Javits Convention Center focused on lower-severity COVID-19positive cases. Both the Comfort and the Javits Center worked closely with local New York health officials to determine patient priority in decanting patients from overwhelmed medical centers in the metropolitan area, including support for both NYC and New Jersey hospitals.¹⁰

The Declaration of the State of Emergency by the Governor of New York State allowed hospitals and health care providers in New York State to apply for and use the Centers for Medicare and Medicaid Services (CMS) section 1135 emergency waiver effective March 1, 2020.^{11,12} CMS Section 1135 is the portion of the health law that includes the requirements for operation of rehabilitation facilities under public health law that limits the types of patients that can be admitted to IRFs and dictates rules for their management. The CMS 1135 waiver was activated in New York State by the declaration of a state of emergency, allowing flexibility in the diagnoses considered for admission to IRFs. This, in turn, allowed the Montefiore Health System rehabilitation hospital to help provide bed capacity for our health system for acutely ill patients with COVID-19. In addition, the waiver provided a temporary suspension of rehabilitation treatment requirements and a mechanism to bypass usual insurance authorization processes. This eliminated several potentially burdensome and timeconsuming steps in the process of patient disposition from an acute care hospital during the emergency when throughput was of high importance. Frequent communication of bed availability in all of our settings and matching of appropriate patient profiles and

DURING COVID CRISIS BEFORE COVID CRISIS Patient Identified as an Patient Identified as an **IRF or SNF candidate IRF or SNF Candidate Social Work Screen Done Social Work Screen Done** ** **Insurance Verification Patient Consent *** ** **Patient Consent Direct MD to MD Facility admission Discussion for Immediate** screen and acceptance Acceptance **Patient/Family Facility** Choice **IRF** Transfer When SNF Transfer When **Medically Ready Medically Ready Facility Referral** * Only one IRF was available during the Crisis **Facility Acceptance** ** Use of insurance Waiver Insurance Authorization Transfer when Medically Ready

Pathways to IRF/SNF

Fig 1 Pathways to rehabilitation.

discharge locations facilitated patient transitions within hours of establishing medical stability.

Two general groups of patients with COVID-19 were identified who would benefit from an IRF setting (appendix 2). The first group included COVID-19—positive patients with a medical acuity that could be safely managed in an acute rehabilitation hospital (IRF), who also had identifiable rehabilitation needs including deconditioning and other associated COVID-19 infection conditions (including myopathy, encephalopathy, cardiomyopathy, coagulopathy associated neurologic events, and resolving respiratory failure). We determined that these patients must be in the convalescent stage of their COVID-19 pneumonia with declining acute phase reactants (C-reactive protein, lactate dehydrogenase, ferritin, D-dimer), have supplemental oxygen needs <5 L/min, and have a safe discharge plan once the IRF program was completed. Rapid identification and admission to an IRF setting for this group of patients permitted earlier hospital discharge while optimizing functional outcome and helped achieve safe discharge to the community after completion of rehabilitation. The second group of patients, whether COVID-19—positive or —negative, were those who met our traditional criteria for admission to an IRF. (appendix 3). Exclusion criteria for



Fig 2 Montefiore Health System IRF admissions during the COVID-19 surge.

admission in both groups that prevented IRF consideration included high-flow oxygen needs (>5L of oxygen via nasal cannula, face mask, nonrebreather mask, or high flow nasal cannula), hemodialysis, peritoneal dialysis, parenteral nutrition, chemotherapy, radiation therapy, or patients who were nursing home residents prior to their admission. With the use of the CMS 1135 waiver and the alterations to our communications pathway, we were successful in establishing rapid transitions to the IRF. The ability to accommodate increased volumes at the IRF was further enhanced by increasing our overall bed capacity in the IRF by creating a "surge unit," adding 10 beds to the usual capacity or 150 beds at the Burke Rehabilitation Hospital (fig 2). The surge of patients at the rehabilitation facility came approximately 2 weeks after the surge of patients in the acute care hospitals, consistent



Fig 3 Comparison of surge of patients in the Montefiore Medical Center and in acute rehabiliation.



Fig 4 Disposition of COVID-19 patients admitted to Montefiore Medical Center, March through April 2020. Abbreviation: MHC, Montefiore Home Care.

with the time for patients to become medically stable enough to need rehabilitation. In a similar fashion, the increased volume of patients persisted for 4 weeks longer than the acute care hospitals, reflecting the time course of recovery of the patients with severe COVID-19 (fig 3).

Providing home care services for patients within our system was similarly challenging. Again, acquiring adequate PPE supply for home care providers was a significant issue, as was ensuring adequate staffing of home attendants, nurses, and therapists (many of whom were ill with the virus themselves)

	IRF	SNF	мнс	ALTERNATE SITE
COVID-19 PCR testing	$\bigcirc ullet$	○●*	$\bigcirc ullet$	$\bigcirc ullet$
O2 NEEDS				
5L NC	~	×	×	✓
<u>< 4L NC</u>	\checkmark	✓	~	\checkmark
HiFlow	×	×	×	\checkmark
HD/PD	×	✓ varies	~	\checkmark
SOCIAL BARRIERS	×	✓ varies	× **	✓
REHABILITATION NEEDS	✓	~	✓	✓
ACUTE PHASE REACTANTS	declining	declining	declining	Varies

POST ACUTE CARE SUMMARY

after May 10, 2020 must be negative
community or family support required

Fig 5 NOTE. Alternate site = acute care, USNS Comfort, Javits Center. Abbreviations: HD, hemodialysis; MHC, Montefiore Home Care; NC, nasal cannula; PCR, polymerase chain reaction. \bigcirc = negative. \bigcirc = positive. \checkmark = can accept. \times = unable to accept.

while providing a supply of oxygen concentrators in the community for newly discharged patients. With a scarcity of available home attendants and testing capability for COVID-19, Montefiore Home Care initially was only able to accept patients with appropriate family support. During the first weeks of the COVID-19 crisis, as these challenges were being addressed, our acute inpatient rehabilitation hospital accepted a volume of about 30 COVID-19-positive patients without rehabilitation needs but with stable severe COVID-19 pneumonia that rendered them unable to return safely to the community without a longer hospital stay. While this provided bed capacity relief to the local acute hospitals, we quickly discovered that a more efficient and safe method of patient allocation was to take severe recovering COVID-19 survivors with rehabilitation needs into the IRF setting quickly and keep the medical patients with COVID-19 at the acute care hospital setting until they were more stable. This adaptation of the rehabilitation admission assessment allowed better overall patient safety and care while maximizing throughput of patients at the acute care hospitals.

As the experience in managing patients with COVID-19 progressed, the patient profile, medical course, and criteria for safe hospital discharge to intensive home care management became clearer to inpatient providers. Working with Montefiore Home Care we were also able to create the capacity to manage patients with COVID-19 at home who required relatively high levels of supplemental oxygen and who could be weaned from that in the home setting. Patients who were accommodated by Montefiore Home Care included the following profile regardless of COVID-19 status: deconditioned patients who could ambulate household distance, patients with new supplemental oxygen needs (<4L at rest, maintaining O₂ saturation >92%), patients with safety concerns that could be managed with home supervision, patients with new durable medical equipment, and patients with mild neurologic or musculoskeletal conditions (appendix 4) Additionally, Montefiore Home Care continued to accept traditional home care patients with heart failure or other coexisting chronic disease requiring active management; patients at highest risk for readmission for chronic obstructive lung disease and heart failure; patients requiring wound care; those with devices such as catheters, drains, and chest tubes; and patients requiring new injections.¹³

Similarly, SNFs presented their own challenges regarding patient transitions from acute care beds. Initially, Executive Order 202.10, issued on March 23, 2020, and subsequent executive orders by the Governor of New York State compelled SNFs to accept COVID-19-positive patients as part of the overall crisis management¹⁴ and meant that returning patients to their SNF was possible. However, it became apparent that SNFs were facing difficulties that could potentially increase COVID-19 infection or impair patient recovery. Common challenges in SNFs included inadequate supplies of PPE, limitations in supply of supplemental oxygen, lack of no touch thermometers, limited availability of testing swabs for COVID-19, lack of access to rapid COVID-19 testing to assess patients with suspected COVID-19 infection (which created a bed shortage within the facilities because patients could wait up to 5-7d as persons under investigation), illness among staff, inadequate staffing, and challenges with dementia and cognitively impaired patients who were unable to comply with isolation requirements. Additionally, because SNFs function for the most part outside of the acute care hospital system, they also had difficulty responding to the rapidly changing patient care

protocols and staff education processes, which quickly evolved as experience with COVID-19 grew. Recognizing these challenges limited their ability to facilitate safe acceptance of COVID-19positive patients, we worked with our SNF partners to overcome some of these barriers. As equipment supplies became more readily available in the acute care hospital setting, we were able to work with some of our nursing home partners to provide PPE (mostly N-95 masks and gowns). For SNF constraints on testing, MHS made 5-10 rapid tests for novel corona virus available per day to SNF partners to help them clear people under investigation and test patients who were recovering. This modest support for testing (the acute hospital was doing in excess of 500-1000 tests/d) allowed the SNFs to reduce the use of PPE and also opened beds to transfer patients from acute care to SNFs. These efforts helped ease some of the constraints limiting transfer to SNFs during the early part of the COVID crisis (appendix 5).

However, it became apparent by the beginning of May that SNFs were becoming epicenters of COVID-19, and on May 10, 2020, there were new executive orders from the New York State Governor (Executive Order 202.30 and 202.40), requiring testing of SNF personnel twice weekly and prohibiting hospitals from discharging COVID-19– positive patients to SNFs.¹⁵ These changes to SNF regulations permitted successful infection tracking, reduced the spread of COVID-19 in these facilities, and facilitated the decline in new COVID-19 cases. A side effect of this change was to slow the process of transferring acute care patients to SNFs, but by May 2020, the acute care hospital admissions were declining and the urgency for acute care beds had waned while the home care services and IRFs were able to absorb most of the patients who had postacute care needs (fig 4).

In the final tally, Montefiore Medical Center discharged 5691 patients with COVID-19 by June 3, 2020. Of those, 1291 (22.7%) died and 4400 (77.3%) survivors were discharged alive. Approximately 300 (6.8%) were discharged to IRFs, 450 (10.2%) were discharged with home care, 220 (5.0%) were discharged to SNFs, and 3400 (77.3%) were discharged home without services. Despite the availability of the USNS Comfort and the Javits Center for help with caring for acutely hospitalized patients with COVID-19 we had fewer than 45 intrahospital transfers.

Conclusions

The onset of the COVID-19 pandemic in the New York area and the need for a rapidly expanding and flexible health care response created a need for a coordinated and collaborative process for patient throughput. The challenge faced required the adaptation and modification of options within the health system's continuum of care, both regarding clinical assessment and discharge pathways. The Department of Rehabilitation Medicine was able to facilitate the movement of patients and create novel, coordinated pathways to move traditional rehabilitation patients and patients with COVID-19-related disability and ongoing medical management issues to the appropriate level and site of care. Working closely with medical teams and discharge teams in our acute care partner institutions, including case management and social work, we were able to identify appropriate candidates; streamline referrals; and rapidly move patients to home care, to IRFs, or to a skilled nursing setting (fig 5). The

framework for our success is because of the expertise and relationships Rehabilitation Medicine has within our hospital system and with postacute care providers. This, and the easing of federal and state regulations regarding transitions of care, allowed us to work rapidly and adapt to new regulations with our home care and IRF and SNF partners, creating new paradigms for care in a continuously changing landscape. As the crisis evolved and patient volumes rose day to day, we were able to pivot with our team-building expertise, collaborating with partners within and outside our medical center.

Keywords

Home care services; Rehabilitation; Skilled nursing facilities; Subacute care

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Appendix 1 Postacute Care Planning

CHALLENGES

- Facilitate acute care bed capacity in system hospitals
- Patients with new O2 and/or dialysis requirements
- Social determinants of health in the local community
- Available PPE in the system and in partner facilities

OPTIONS

- One IRF available
- SNF variable capacity to accept patients
- Alternate sites, USNS Comfort, Javits New York Medical Station
- · Community discharge, Montefiore Home Care

Appendix 2 IRF Criteria, Post COVID-19 Admission*

- Rehabilitation needs
- O_2 requirements ≤ 5 L by nasal cannula
- COVID-19 laboratory results convalescent phase (LDH, D-dimer, ferritin, inflammatory markers, WBC)
- · Ability to participate in IRF-level program
- · Safe disposition after completion of IRF program

Exclusions: need for hemodialysis or peritoneal dialysis, highflow oxygen, parenteral or nutrition, nasogastric tube, ongoing chemotherapy or radiation therapy, social barriers to discharge.

Abbreviations: LDH, lactate dehydrogenase; WBC, white blood cell.

*Burke Rehabilitation Hospital

Appendix 3 CMS: Medical Conditions That Require Intensive Rehabilitative Services Under CMS Revised §412.23 (b)(2)

- Stroke
- Spinal cord injury
- Congenital deformity
- Amputation
- Major multiple trauma
- Fracture of femur (hip fracture)
- Brain injury
- Neurologic disorders, including multiple sclerosis, motor neuron diseases, polyneuropathy, muscular dystrophy, and Parkinson disease.
- Burns
- Active, polyarticular rheumatoid arthritis, psoriatic arthritis, and seronegative arthropathies resulting in significant functional impairment
- Systemic vasculidities with joint inflammation, resulting in significant functional impairment
- Severe or advanced osteoarthritis (osteoarthrosis or degenerative joint disease) involving 2 or more major weight bearing joints (elbow, shoulders, hips, or knees, but not counting a joint with a prosthesis) with joint deformity and substantial loss of range of motion, atrophy of muscles surrounding the joint, significant functional impairment of ambulation and other activities of daily living
- Knee or hip joint replacement, or both, during an acute hospitalization immediately preceding the inpatient rehabilitation stay and also meet 1 or more of the following specific criteria: (1) patient underwent bilateral knee or bilateral hip joint replacement, (2) patient has a body mass index of at least 50, and (3) patient is age 85 y or older

Appendix 4 Community Discharge Post COVID-19 Admission

NO SERVICES

Clinical outreach for post discharge review, including RN telephonic medication reconciliation and subjective assessment of symptoms, social work outreach.

Exclusion: newly on O₂, rehabilitation needs.

MHC - REHABILITATION AND/OR NURSING NEEDS

Rehabilitation needs, safety concerns, that is, stairs, transfers, new durable medical equipment or assistive device.

New supplemental oxygen

Wound care. Devices, catheters, drains, and so on. New injections.

CHF or other chronic diseases requiring active management, patients at high risk of readmission, that is, CHF, COPD. Co-morbid neurologic and musculoskeletal conditions

Exclusion: patients without family or caregiver support.

Inclusion: ability to self-isolate if necessary, ambulating less than 150 ft.

Abbreviations: CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; MHC, Montefiore Home Care.

Appendix 5 SNF Criteria Post COVID-19 Admission

- Meet oxygen capability of facility
- Facility has adequate PPE and ability to test patients
- COVID-19 laboratory data convalescent phase
- Patient unable to tolerate IRF level of rehabilitation

Exclusions: vary by facility.

General - high-flow O₂, parenteral nutrition, presence of nasogastric tube, safe discharge post rehabilitation.

COVID-19—positive status — May 10, 2020, by Executive Order, Governor of State of New York.

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