Adapting Hematology and Medical Oncology Clinical Care in the Epicenter of the Covid-19 Pandemic

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Introduction

By April 2020, New York City was the world epicenter of the Covid-19 pandemic. In five short weeks, New York went from no reported cases to its deadliest 24-hour period to date, reporting 779 Covid-19 deaths on April 8. NewYork-Presbyterian admitted its first community-acquired Covid-19 case on March 1, 2020, and since that time, we have made significant transformations in our clinical services for cancer care to reduce the risk of Covid-19 exposure for cancer patients while continuing to provide essential oncologic care. We also sought to mitigate the risk of Covid-19 exposure for healthcare providers, to flatten the curve of patients with Covid-19 who would require hospitalization, and to prepare to redeploy staff to care for an onslaught of Covid-19 patients.
To provide rapid and efficient care for patients affected with Covid-19, NewYork-Presbyterian (NYP), the highest ranked health care system in New York and the surrounding region according to U.S. News and World Report, completely modified its processes and operations. NYP is the only hospital system in the United States that is affiliated with two of the nation’s top medical schools, Weill Cornell Medicine and Columbia University Vagelos College of Physicians and Surgeons. NYP encompasses 10 hospital campuses across Manhattan and surrounding boroughs, and a workforce of 47,000, including 10,263 physicians; across our enterprise, we provided 3.6 million patient encounters (inpatient and outpatient) in 2018.

To prepare for the large anticipated influx of patients with Covid-19 requiring intensive care, while also ensuring our patients with cancer received appropriate care, significant changes were implemented. In concert with Weill Cornell Medicine (WCM) and Columbia Doctors, elective surgical procedures were cancelled, telemedicine increased exponentially, outpatient clinics were converted to inpatient floors, new intensive care units were created, and the health care workforce was redeployed to meet the needs of Covid-19 patients. The initial shortage of personal protective equipment (PPE) and the unavailability of generalized testing for SARS-CoV-2 necessitated important clinical care decisions as well.

This unprecedented scenario, which is occurring in health care centers across the world, has required a massive reorganization in the routine care of patients, including those with cancer. Patients with suspected cancer require rapid evaluation, multidisciplinary assessment, accurate diagnosis and staging in order to develop the most effective treatment plan. Often, time is of the essence in patients with rapidly growing or aggressive tumors, and the best management depends on timely treatment.

Covid-19 poses real risks to patients with cancer. Many patients are immunosuppressed as a consequence of their cancer or the treatments they receive. Patients with cancer appear to be twice as likely to contract Covid-19, more likely to require intensive care, and significantly more likely to die of the disease.

In an effort to redirect resources (staff, space, and PPE) to combat Covid-19, while also providing the best possible care for patients with cancer, collecting clinical data to inform us in the future, and maintaining the wellbeing of our team, NYP and WCM implemented a series of processes, set up management guidelines, reconfigured practices and patient flows, and developed research protocols. As we are one of the busiest Covid-19 centers in the world, we trust our experience can provide some guidance and insight to others experiencing a similar situation.

**Leadership Communication Strategy**

Early in the course of the pandemic the Division of Hematology and Medical Oncology established a daily leadership call among a team of about ten people including the division chief, service chiefs, fellowship directors, outpatient and inpatient clinical operations directors, infusion center directors, division administrator, hospital oncology director, and practice managers. This team functioned as a “crisis cabinet” and was charged with the overall organization of divisional efforts in response to the changing demands and in accordance with the WCM and NYP overall strategy.
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As the situation evolved constantly, this daily meeting was critical. The team discussed emergent issues, new developments and guidelines, made rapid decisions, set up the action items for the day, and monitored the performance of the actions taken. Specific topics included consolidation of sites for better integration of clinical care and redeployment of personnel, clinical standard operating procedures and patient flow, patient billing, psychosocial support for patients and clinical staff, and emerging research opportunities.

Once a week we held a Division-wide information meeting. We found this strategy helped us to function as a cohesive team and gave us a sense of control, despite the uncertain and stressful ongoing situation.

Guidelines for Outpatient Management

We established new approaches to cancer treatment in several key areas. They include:

Coordinated Reduction in On-Site Clinical Volume

Patient management decisions were made based on criteria set forth by professional societies such as ASCO and ESMO, and with discussion among the treatment team and patient. Patients whose cancers required urgent treatment were prioritized, and patients who had more indolent disease that could be safely delayed by several weeks were rescheduled.

Telemedicine capability, recently introduced but not yet widely used, was expanded to all clinical faculty across the Division, given that patients faced heightened risks from coming to the medical center, and to achieve adequate social distancing. Successful implementation included telemedicine training aids for faculty on how to schedule and conduct video visits, and patient education to enhance enrollment in the Weill Cornell Medicine patient portal. Telemedicine visits allowed physicians, patients, and caregivers to stay personally connected, while managing their cancer during this crisis. We provided a starting script for having discussions about goals of care if that was appropriate, as well as guidance for management of patients with Covid-19 symptoms or for those who were at high risk for contracting Covid-19.

All patients were contacted prior to their visits to determine whether a telemedicine visit was appropriate or if an in-person visit was indicated. Most patients whose cancer treatment required blood test monitoring had their blood taken at local laboratories 24-48 hours prior to their telemedicine visit. As a result of these significant changes in practice, particularly the dramatic increase in telemedicine visits, total physician visit volume decreased by only 7% from February to March, despite a reduction in onsite outpatient visits of 13.5%. In the first seven outpatient working days of April, telemedicine video visits made up 55% of total visit volume (versus less than 1% of...
total volume in February). Notably, of the 71 new patient visits, 61 (86%) were conducted by video visit, and 11 video visits were performed on Sunday, April 5, a day when clinic visits would normally not be available. (The division may continue to offer Sunday telemedicine visits post-pandemic.)

**Covid-19 Screening and Covid-19-Positive Outpatient Clinical Areas**

Nurse practitioners, physician assistants, or physician faculty contacted every patient by telephone the day prior to their in-person visit to screen for Covid-19 symptoms (fever, cough, sore throat, shortness of breath, diarrhea, change in taste, or other unexplained new symptoms), or recent exposure to a Covid-19 infected individual. If patients screened positive, physician faculty were notified, and a decision was made whether to keep the patient at home and wait for symptoms to resolve, bring the patient to the emergency department (ED) for urgent evaluation, or ask the patient to come to our Covid-19 screening clinic (Figure 1). If deemed appropriate for an in-person visit, all patients were asked to come alone unless they required special assistance, a significant change to our visitor policy intended to protect patients and staff.
FIGURE 1

Patient Flow diagram

Patients were called prior to their scheduled visits and triaged as indicated in the schematic. Some patients could be deferred. Those who were known to be Covid-19 positive, or had symptoms consistent with Covid-19, were evaluated in pre-specified restricted treatment areas. Asymptomatic patients (by phone screen) were also screened upon arrival to the outpatient clinic area, and those with Covid-19 symptoms were triaged to the Covid symptoms area.

Regardless of their telephone pre-screening, all patients and visitors who presented to clinic were also immediately screened by nursing for classic Covid-19 symptoms and had their temperature taken. If they screened positive, a decision was made to either send them home to recover or to be evaluated in the Covid-19 screening clinic.

The Covid-19 screening clinic was stationed in a separate area, distinct from the rest of the clinic area, with adequate availability of PPE for nursing and physician staff. Infection Prevention and Control provided guidance on how to minimize exposure risk within this space. Patients were asked to come to our Covid-19 screening clinic if they had Covid-19 symptoms and required medical management, if the knowledge of their Covid-19 status would impact their treatment plan, if there was concern that Covid-19 might impact their cancer recovery, or if they were in the process of being directly admitted for oncologic issues and their Covid-19 status was unknown. Patients

Source: Weill Cornell Medicine and NewYork-Presbyterian Hospital
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who required Covid-19 testing prior to admission underwent rapid testing and were then directly admitted to the inpatient oncology unit, bypassing the ED.

In the first two weeks of operations, 17 patients with hematologic malignancies were evaluated in the Covid-19 screening clinic, and 11 patients had confirmed Covid-19 positive results. Adjacent to the screening clinic, we repurposed an 8-chair wing of our infusion center for patients pending Covid-19 results to receive stabilizing supportive treatments such as blood products. Patients with cancers of solid organs suspected or confirmed of being infected with Covid-19 were for the most part able to defer evaluation and treatment until their Covid-19 symptoms abated.

Anticipating the development of a positive Covid-19 cohort that would still need supportive treatment to avoid hospitalization, we also repurposed space to create a separate location to manage confirmed positive Covid-19 patients. Patients were able to register remotely, reducing the need for a non-clinical staff member. To minimize clinical staff exposure and use of PPE, a physician and/or an advanced practice provider (APP), and a chemotherapy nurse staffed the unit, and we arranged courier pick-up of laboratory samples and delivery of drugs and blood. We opened on March 30th, and in the first two weeks of operation, one to two Covid-19 positive patients were treated daily with blood products.

### Consolidation of Locations to Significantly Reduce our Clinical Footprint

The division worked closely with the information technology department to enable crucial office telephones and fax-lines to be transferred, enabling secretarial staff to work from home and decrease the likelihood of a work-related exposure. Additionally, the faculty quickly developed rotation “teams” for clinical coverage. In this programming, physicians and APPs rotate daily to minimize service exposure, while also providing a back-up team in case of exposure (Table 1 provides a sample outpatient schedule). For hematology and oncology programs (e.g., leukemia, lymphoma, and bone marrow transplant) with a significant inpatient volume (average daily census of 116 patients), physicians and APPs were reorganized into separate inpatient and outpatient teams, to reduce the opportunity for cross-contamination.

As the need to provide care for patients with Covid-19 increased across the entire NYP system, our physicians, APPs and nurses were redeployed from the hematology and oncology services to the Covid-19 units. Strategic decisions were made to optimize clinical teams on all internal medicine and subspecialty divisions, coordinated directly with the faculty and taking into consideration time since completion of training, internal medicine board certification, recent inpatient service experience, and current clinical care volume, among other factors.

| Day          | Physician Team | APP  | Chemotherapy Nurse | Med Tech |
|--------------|----------------|------|--------------------|----------|
| March 30–31  | Team A         | PA-1 | Nurse A/Nurse B    | MT-1     |
| April 1–2    | Team B         | PA-2 | Nurse B/C          | MT-2     |
| April 3, 6   | Team C         | PA-1 | Nurse A/C          | MT-1     |
| April 7–8    | Team A         | PA-2 | Nurse A/B          | MT-2     |
| April 9–10   | Team B         | PA-1 | Nurse B/C          | MT-1     |

To maximize patient care while minimizing healthcare worker exposure, each physician Team comprises two physicians and one advanced practice provider. The chemotherapy unit, under reduced patient volume functioned with two nurses on a rotating basis. Source: Weill Cornell Medicine and NewYork-Presbyterian Hospital.
To further reduce the clinical workforce imprint, practices were consolidated from five locations to three: one at the main hospital, with ready access to the blood bank that serviced the hematologic malignancy and bone marrow transplant programs, and two locations adjacent to the hospital, both of which served the solid tumor malignancy and the blood disorder programs. Each site required reduced staff numbers, but maintained an ability to see patients either in person or virtually. The net result was a reduction of the clinical staff campus presence by 50% from prior to Covid-19 levels, while maintaining significant clinical volume. This reduction permitted the redeployment of clinical staff to other areas of the hospital, including the redeployment of 53% of our clinical fellows and 57% of the hematology and medical oncology faculty to medicine units, overnight coverage, and intensive care units.

Of our 28 full-time direct care adult infusion nurses, excluding those on orientation and leave, five were redeployed to other areas of the hospital in crisis. Interestingly, despite region-wide closures of schools and a rampant virus, we saw a decrease in benefit time usage. Our benefit time as a percent of paid time in our ambulatory infusion centers was 16.8% September 2019 through February 2020, and this rate has decreased to 15.4% since then.

The Covid-19 epidemic in New York City placed several demands on our group that are likely not specific to our practice. Our Division of Hematology and Medical Oncology is a large and heterogeneous division with 60 clinicians and clinical researchers and 20 laboratory-based investigators, responsible for approximately 53,070 infusions annually. The patients we manage are significantly disparate, ranging from patients who are immunosuppressed and unable to mount antibody responses to infection to those who are critically ill but with adequate immunity. Coming together in a uniform way was necessary to adequately manage our patient population while meeting the challenges of the Covid-19 epidemic. We had to reduce patient volume where we could and consolidate space, and also create new clinics to manage Covid-19 positive patients and patients with highly suspicious symptoms.

When the city reopens its doors, we expect to maintain some aspects of this redeployment of space and personnel. We may not reopen one of the closed locations because telemedicine video encounters are likely to continue and expand. We also expect we will continue to need Covid-19 specific treatment areas as the virus works its way through our region.

“This crisis has also been the impetus to develop new multidisciplinary clinic strategies and to expand patient navigation with the objective of better appointment coordination to reduce the travel requirements patients may experience while managing their malignancy.”

Moving forward, all oncology services will face the challenge of how to continue treatment for cancer patients during the Covid-19 crisis. Preliminary data suggest that immunocompetent patients with mild symptoms recovering from Covid-19 may remain PCR-positive for SARS-CoV-2 for up to two weeks, but patients with severe symptoms or immunocompromised patients may continue to shed virus for even longer.9 This long period of possible infectiousness will have
significant implications as we “normalize” and expand our outpatient clinics and infusions. A survey of our physicians suggests that our practices will also likely change as we come out of the lockdown. We now anticipate 25-35% of our patient visits will now be telemedicine visits. This crisis has also been the impetus to develop new multidisciplinary clinic strategies and to expand patient navigation with the objective of better appointment coordination to reduce the travel requirements patients may experience while managing their malignancy.

As the pandemic advances and challenges other large cities and health care systems, we hope these modifications will serve as useful guidance for cancer care teams.

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