


# Hematology and Oncology Clinical Care During the Coronavirus Disease 2019 Pandemic

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**Abstract:** New York City has been at the epicenter of the coronavirus disease 2019 (COVID-19) pandemic that has already infected over a million people and resulted in more than 70,000 deaths as of early May 2020 in the United States alone. This rapid and enormous influx of patients into the health care system has had profound effects on all aspects of health care, including the care of patients with cancer. In this report, the authors highlight the transformation they underwent within the Division of Hematology and Medical Oncology as they prepared for the COVID-19 crisis in New York City. Under stressful and uncertain conditions, some of the many changes they enacted within their division included developing a regular line of communication among division leaders to ensure the development and implementation of a restructuring strategy, completely reconfiguring the inpatient and outpatient units, rapidly developing the ability to perform telemedicine video visits, and creating new COVID-rule-out and COVID-positive clinics for their patients. These changes allowed them to manage the storm while minimizing the disruption of important continuity of care to their patients with cancer. The authors hope that their experiences will be helpful to other oncology practices about to experience their own individual COVID-19 crises. *CA Cancer J Clin* 2020;70:349-354. © 2020 American Cancer Society.

## Introduction

As of mid-April 2020, New York State, and New York City in particular, was the world epicenter of the coronavirus disease 19 (COVID-19) pandemic. On April 8, New York experienced the deadliest 24-hour period to date, reporting 779 COVID-19 deaths in New York alone, and a total of 6298 deaths thus far.<sup>1</sup> This was just 5 short weeks from the very first case reported in the New York area—a 39-year-old health care worker who had recently visited Iran—on March 1, 2020. New York-Presbyterian (NYP) admitted its first community-acquired case of COVID-19 on March 3, 2020. Since then, there has been a significant transformation in clinical services, one that has had dramatic effects on cancer care.<sup>2</sup> The underlying aims of the modifications outlined herein were to reduce the risk of COVID-19 exposure for patients with cancer while continuing to provide essential oncologic care, to mitigate the risk of COVID-19 exposure for health care givers,<sup>3</sup> to flatten the curve of patients with COVID-19 who would require hospitalization, and to prepare our staff for the inevitable necessity of re-deployment to care for an anticipated, massive increase of COVID-19 positive patients.

To provide rapid and efficient care for patients affected with this disease, NYP, a large, academic health care system in New York and surrounding region, completely modified its processes and operations, working in coordination across departments and in every facet of medical care. Elective surgical procedures were cancelled, telemedicine was exponentially increased, outpatient clinics were converted to inpatient floors, new intensive care units (ICUs) were created, and the entire health care workforce was redeployed to meet the needs of patients with COVID-19. The shortage of personal protective equipment (PPE) and the unavailability of generalized testing for severe acute respiratory syndrome coronavirus 2 (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. Notably, patients with suspected cancer require rapid evaluation, multidisciplinary assessment, and accurate diagnosis and staging to develop a treatment plan. Often, time is of the essence and is even critical in patients with rapidly growing or aggressive tumors such as acute leukemias, high-grade lymphomas, and small cell lung cancer. Not infrequently, cancer presents as an emergent medical problem. In addition, it is well known that effective management depends on timely administration of treatments. Many patients are immunosuppressed as a consequence of the disease or the treatments they receive. Early evidence suggests that patients who have cancer may have a higher incidence of infection compared with patients who do not have cancer.<sup>4</sup> In a large retrospective cohort of 1524 patients with cancer seen in the Zhongnan Hospital of Wuhan University between December 30, 2019 and February 17, 2020, COVID-19 occurred in 12 of 1524 patients (incidence, 0.79%; 95% CI, 0.3%-1.2%), compared with a 0.37% cumulative incidence in Wuhan, China, over the same time period.<sup>4</sup> In a separate retrospective cohort study that included 18 patients with cancer who had COVID-19 (of 1590 total patients with COVID-19), patients with cancer appeared to be at higher risk for ICU admission, invasive ventilation, or death compared with patients who did not have cancer (39% vs 8%;  $P = .0003$ ).<sup>5</sup> As our division began to plan for the COVID-19 crisis to hit New York City and our hospital, we were planning for this possibility—that patients with cancer may be twice as likely to contract COVID-19, more likely to require intensive care, and significantly more likely to die of the disease.<sup>4,5</sup>

In an effort to redirect resources (health care workers, clinical space, and PPE equipment) 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 well-being of our team, we implemented a series of processes, set up management guidelines, reconfigured practices and patient flows, and developed research protocols. Here, we provide a description of these actions. Because 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 Structure and Communication Strategy

Early in the course of the pandemic, the Division of Hematology and Medical Oncology established a daily leadership video conference call. Included in this conference were the division chief, service chiefs (Leukemia, Lymphoma, Solid Tumors, Blood Disorders, Myeloma, and Bone Marrow Transplantation [BMT]), fellowship directors, outpatient and inpatient clinical operations directors, infusion center directors, division administration leader, 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 Weill Cornell Medicine (WCM) and NYP overall strategy. As the situation was changing constantly, this scheduled meeting was critical for an organized, rapid, and effective response. 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, redeployment of personnel, clinical standard operating procedures and patient flow, patient billing, psychosocial support for patients and clinical staff, and emerging research opportunities.

Representatives, which included the division chief and the heads of inpatient and ambulatory oncology care, participated in regular meetings with the Department of Medicine chair and heads of other departments to coordinate inpatient and outpatient care of patients as the crisis developed. This included the creation of new ICU and medicine teams to manage the increased patient volume related to COVID-19, temporarily halting procedures and nonemergent surgeries to create more space for intensive needs and to reduce the use of PPE so that it could be used for COVID-19 management, and redesigning emergency department (ED) care to address COVID-19-specific emergency care.<sup>6</sup> This allowed for a major expansion of the ICU bed capacity (at its peak, over 200 patients were intubated). All of these coordinated efforts were in concert with Infection Control and Prevention, which also provided guidelines for use of PPE, recommendations for patient isolation and quarantining, and appropriate testing when it became available. Once a week, we held a division-wide information meeting. We found that this

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strategy helped us to function as a cohesive team and gave us a sense of control, despite the uncertain and stressful ongoing situation.

### Adapting Outpatient Management

To balance the reality of a high and rapidly increasing acute COVID-19–positive patient population, a reduced workforce, insufficient PPE, the need to mitigate the exposure risk, and the limited testing capacity for COVID-19, a series of coordinated modifications in our clinical operations were enacted.

#### Coordinated Reduction in On-Site Clinical Volume

Patient management decisions were made based on criteria set forth by professional societies, such as the American Society of Clinical Oncology<sup>7</sup> and the European Society for Medical Oncology,<sup>8</sup> and with discussion among the treatment team and patient.<sup>9</sup> Patients who had cancer that required urgent treatment were prioritized, and patients who had more indolent disease that could be delayed by several weeks to months were rescheduled. Patients who were unable to receive supportive care locally, including management of central lines, were also seen. The Division of Hematology and Medical Oncology rapidly and significantly expanded its telemedicine capability to all clinical faculty across the division. Implementation of this expansion included telemedicine training aids provided to faculty to conduct and schedule video visits and patient education to enhance enrollment in Weill Cornell Connect (the WCM/NYP patient portal) to facilitate the use of telemedicine. In addition, we implemented new guidance and policy, including a job aid for having goals-of-care discussions through telemedicine or telephone encounters; guidance for patients with solid tumors, who are primarily managed as outpatients; and guidance for the management of patients with COVID-19 symptoms or those who were at high risk for contracting COVID-19 (eg, living with a COVID-19–positive individual).

Patients were contacted before their visits to determine whether a telemedicine visit was appropriate or if an in-person visit was indicated. Patients requiring blood test monitoring had prescriptions sent to them so that blood could be taken at local laboratories 24 to 48 hours before their telemedicine visit if possible, allowing them to be reviewed and discussed at the time of the encounter. As a result of these significant changes in practice, physician visit volume decreased by only 7% from February to March 2020, despite a reduction in onsite clinical outpatient visits of 13.5%. This was attributed to an increase in telemedicine video visits by nearly 700 monthly video visit encounters, a 17,450% increase in just a single month (Table 1). Furthermore, in the first 7 outpatient working days of April (April 1–9, 2020),

TABLE 1. Changes in Monthly Ambulatory Activities

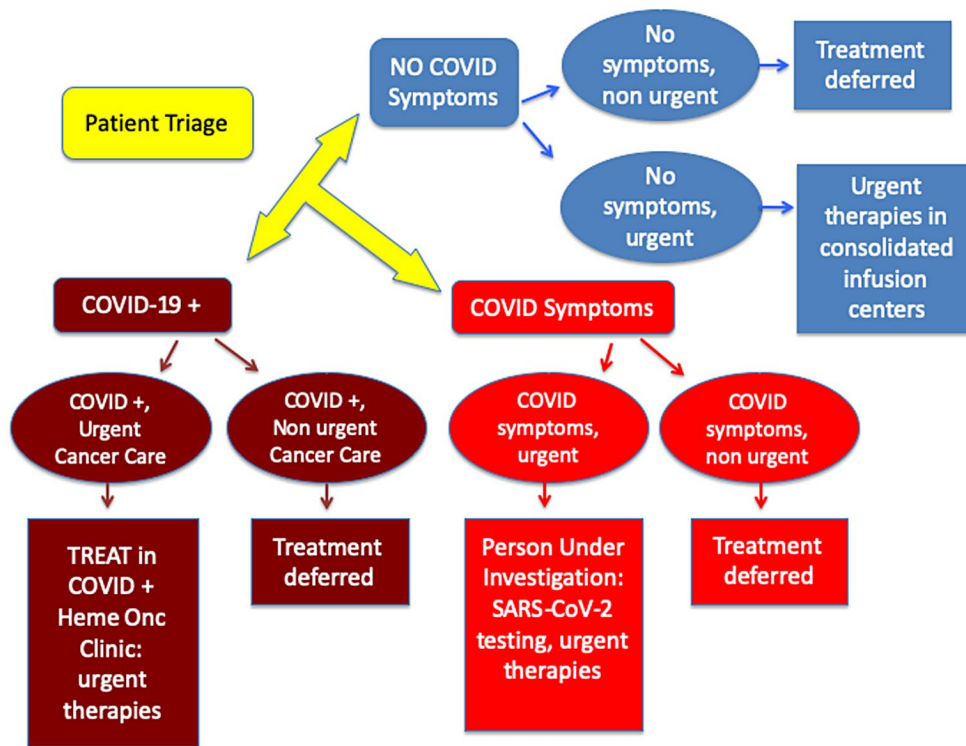
Activity	February	March	Change in Volume	Percent Change
Video visits	4	702	+698	+17450%
On-site clinical visits	11,057	9561	–1496	–13.5%
Total volume	11,061	10,263	–798	–7.2%
Infusion center volume	2747	2398	–348	–12.7%

telemedicine video visits comprised 55% of the total visit volume (vs 0.04% of the 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. Patients who were appropriate for video visits as an initial consultation were given an option for a telemedicine video visit or an in-person consultation. We found that patients, including the new patient consultations, were generally relieved that they could have a telemedicine video consultation without leaving their home.

#### Previsit and Rule-Out COVID-19 Screening and COVID-Positive Outpatient Clinical Areas

The Hematology and Medical Oncology Division clinical faculty and staff contacted every patient by telephone the day before their in-person visit. If patients screened positive for suspected COVID-19 (fever, cough, sore throat, shortness of breath, diarrhea, change in taste, or other unexplained new symptoms) or were recently exposed to a COVID-19–infected individual, such as a spouse or child, then clinical faculty were notified, and a decision was made whether to keep the patient at home and wait for symptoms to resolve, bring them to the ED for urgent evaluation, or ask the patient to come to our COVID-19 screening clinic (Fig. 1). If deemed appropriate for an in-person visit, all patients were asked to come alone unless they required special assistance; WCM and NYP introduced a strict visitor policy intended to protect patients and staff and required that adult patients could not be accompanied unless they had special needs (eg, reduced mobility or reduced cognitive function).

Regardless of their telephone prescreening, all patients and visitors were given a surgical mask upon entering the building by security and, upon presenting to clinic, were also immediately screened in the waiting area before checking in by clinical personnel for COVID-19 symptoms (specifically, sore throat, fever, shortness of breath, and cough) 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. We examined the success of our screening in a cohort of 62 patients and found that only 1 tested



**FIGURE 1.** Patient Flow Diagram. Patients were called before their scheduled visit and were triaged. Patients who could be deferred were. However, patients who were having symptoms consistent with coronavirus disease 2019 (COVID) or were known to be positive were evaluated in prespecified restricted treatment areas. Patients were also screened upon arrival to the outpatient clinic area, and those with COVID-19 symptoms were also triaged according to the flow diagram. COVID+ indicates COVID-positive; Heme Onc Clinic, hematology-oncology clinic; SARS-CoV2, severe acute respiratory syndrome coronavirus 2.

positive for SARS-CoV-2 (1.6%; 95% CI, 0%–4.7%). This is notable because the rate of positivity in New York City at that time was 24.7% based on serology.<sup>10</sup>

The COVID-19 screening clinic was stationed in a separate area, distinct from the rest of the common clinic area, with adequate availability of PPE for nursing and physician staff, which included a surgical mask, face shield, gloves, and a gown. For patients who required procedures, an N95 mask was used. Typically, the N95 masks would be covered by a separate surgical mask, so that they could be reused if not soiled. Infection Prevention and Control provided guidance on how to minimize exposure risk within this screening clinic. 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 affect their treatment plan, if there was concern that COVID-19 might affect their recovery (eg, in BMT recipients who were in remission), or if they were in the process of being directly admitted for oncologic issues and their COVID status was unknown. The standard SARS-CoV-2 test would typically provide results in 6 to 8 hours. However, patients who were being admitted required COVID-19 testing before admission. These patients underwent rapid screening (2-hour to 4-hour testing) and were then directly admitted to the inpatient oncology unit, bypassing the ED and minimizing exposure for these

vulnerable patients. In coordination with other hospital services, rapid testing was also performed before necessary invasive procedures that took place in our department (eg, bone marrow biopsy and aspirate) or in other departments (eg, endoscopy, interventional radiology, etc).

In the first 5 weeks of operation, 57 patients with hematologic malignancies were evaluated in the COVID screening clinic, and 19 patients had confirmed COVID-19–positive results. These patients were treated with blood products, intravenous fluids, and other medications as needed in the outpatient setting; adjacent to the screening clinic, we repurposed an 8-chair wing of our infusion center for patients under COVID evaluation. Outpatients with solid tumors suspected or confirmed of being infected with COVID-19, for the most part, were able to defer evaluation and treatment until their symptoms abated.

Anticipating the development of a positive COVID-19 cohort that would still need supportive treatment, we also created a separate location to manage confirmed COVID-19–positive patients who had cancer. It was expected that this patient group would most likely consist of patients with hematologic malignancies, because those with solid tumor malignancies either would be able to delay treatment or would need to be admitted for management. To minimize clinical staff exposure, a physician and/or an advanced practice provider (APP), and a chemotherapy nurse staffed the unit. Patients

**TABLE 2. Sample Coverage Schedule for Outpatient Clinic and Infusion Suite<sup>a</sup>**

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

Abbreviations: APP, advance practice provider; Med Tech/MT, medical technician.

<sup>a</sup>The objective was to maximize patient care while minimizing health care worker exposure. Each physician team is comprised of two physicians and one advance practice provider. The chemotherapy unit, under reduced patient volume, functioned with two nurses on a rotating basis.

were able to register by kiosks or by remote registration, reducing the need for a nonclinical staff member. Couriers picked up clinical laboratory specimens and delivered drugs and blood products. We opened on March 30, 2020, and, in the first 2 weeks of operation, one or two COVID-19-positive patients were treated daily with blood products.

### Consolidation of Practices to Significantly Reduce Our Clinical Footprint

All Hematology and Medical Oncology Division treatment centers initiated plans to allow a majority of staff to work from home. The division also 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. In addition, the faculty quickly developed rotation *teams* for clinical coverage. In this programming, physicians and APPs rotate daily to minimize service exposure (for a sample outpatient schedule, see Table 2). The advantage of this rotating schedule was to limit exposure and provide a back-up team, as needed. For example, if any one member of a team was exposed and required to be quarantined, another team that was not similarly exposed would be available to allow for medical care to continue. For hematology and oncology programs with a significant inpatient volume (eg, leukemia, lymphoma, and BMT), physicians and APPs were reorganized into separate inpatient and outpatient teams to reduce the probability of cross-contamination.

In parallel, as the needs to provide care for patients with COVID-19 unit increased across the entire NYP system, 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 fronts, coordinated directly with the Hematology and Medical Oncology faculty taking into consideration time since completion of training,

internal medicine board certification, recent inpatient service experience, and current clinical care volume, among other factors.

To further reduce the clinical workforce imprint, practices were consolidated from 5 to 3 locations; one at the main hospital, with ready access to the blood bank that serviced the hematologic malignancies and BMT services, and 2 locations adjacent to the hospital, for both solid tumor malignancies and hematology. Each of these remaining sites remained operational, treating a reduced volume with lower staff numbers. The net result was a reduction of the clinical staff campus presence by 50% from before COVID-19 levels.

As a result of these changes, we were able to greatly reduce the onsite clinical staff requirement while simultaneously maintaining significant clinical volume. For example, the volume of infusions administered in March was only 12.7% lower than the infusions given in the month of February (Table 1). This permitted the redeployment of clinical staff to other areas of the hospital to manage COVID-19-positive patients, including the redeployment of 53% of our clinical fellows and 57% of the Hematology and Medical Oncology faculty to Medicine units, overnight coverage, and ICUs. In addition, of our 32 full-time, direct care adult infusion nurses, excluding those on orientation and leave, 19% have been 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 pre-COVID-19 versus the last 5 weeks (March 2 to April 3, 2020). Our benefit time as a percent of paid time in our ambulatory infusion centers was 16.8% from September 2019 through February 2020, and this rate decreased to 15.4% in the last 5 weeks. As a result of reducing the load on our clinical staff, we were able to adequately cover our outpatient and infusion centers while also encouraging staff to stay home when exhibiting even mild COVID-like symptoms. For employee COVID viral testing, we initially focused on testing employees who had atypical symptoms to rule out COVID so they might be able to return to work sooner than 7 days from symptom onset.

### Conclusions

The COVID-19 pandemic imposes unprecedented demands on our health care systems. As one of the world's epicenters of the pandemic, New York City and state health care capabilities have been expanded and reconfigured very rapidly to provide the best possible care to patients with COVID-19 infection while maintaining the necessary care for patients with non-COVID-19 illnesses, including cancer and hematologic disorders. Here, we provide a summary of the changes in operating procedures in the Hematology and Oncology Services of WCM and NYP to continue providing safe and

essential cancer care while protecting our patients and personnel, minimizing resource utilization, and redeploying members of our team to inpatient COVID-19 units. The adaptations we made are centered around communication and coordination, both within our division and within our hospital, and planning for anticipated changes in volume and acuity. These tenets can serve as useful guides that can be implemented across the nation as other health care centers begin to experience the COVID-19 pandemic more acutely.

Moving forward, another challenge we will all face is how to resume treatment for patients with proven or presumed COVID-19 infection. Preliminary data suggest that immunocompetent patients with mild symptoms may remain

polymerase chain reactive-positive for SARS-CoV-2 and infective for up to 2 weeks, but patients with severe symptoms or immunocompromised patients may continue to shed virus for even longer.<sup>11</sup> More recent data suggest that some patients may continue to be SARS-CoV-2-positive for significantly longer, up to 6 weeks after symptom onset.<sup>12</sup> As we understand the disease further, specifically in patients with cancer and in those who received therapy, these types of data will have significant implications as we expand our outpatient clinics and infusions.

As the pandemic advances and challenges health care systems across the country, we hope these modifications will serve as useful guidance for cancer care teams. ■

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