

Ensuring the Safety of Hospitalized Oncology Patients During a Pandemic

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Authors' disclosures of conflicts of interest are found at the end of this article.

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Abstract

Patients with hematologic malignancies present a unique set of circumstances during the COVID-19 pandemic; they are at increased risk of complications and death from COVID-19 infection, but the treatment of their cancer cannot be delayed. This article highlights some of the practice changes made by an inpatient hematology/oncology advanced practice provider team at a large academic institution in Philadelphia, Pennsylvania, at both a hospital-wide and service level. Practice changes have included restructuring the rounding process, imposing visitor restrictions, adjusting blood transfusion parameters, and implementing creative communication approaches to keep patients and families informed while practicing medicine under stringent new guidelines. Low COVID-19 infection rates at this particular hospital demonstrate that, while these changes were difficult, they were successful in preventing transmission of COVID-19 and keeping both patients and providers safe.

The societal impacts of the COVID-19 pandemic have been devastating and far reaching, and the effects on the health-care industry have been unparalleled. The pandemic forced health-care systems to reinvent and restructure at a dizzying pace, with no precedent from which to learn. Hospitals in the United States and across the world rapidly reorganized their care models to accommodate patients with COVID-19 while working to maintain safe and effective clinical management for the general patient population. This has required mas-

sive planning and creativity at all levels of the health-care system.

For certain patient populations, hospitalization is unavoidable and time sensitive. This is the case for liquid oncology patients whose care cannot be delayed. This article highlights some of the steps taken by an inpatient hematology/oncology advanced practice provider (APP) service at a large academic medical center in Philadelphia, Pennsylvania. The APP service comprises nurse practitioners and physician assistants responsible for managing the care of patients with leukemia, lymphoma, and multiple myeloma.

Evidence has demonstrated poorer outcomes for patients with hematologic malignancies who test positive for COVID-19. A Wuhan retrospective study found that patients with hematologic cancer fared the worst, with higher overall rates of mortality (33.33%), ICU admissions (44.44%), risk of severe/critical symptoms (66.67%), and possible use of invasive mechanical ventilation (22.22%; Dai et al., 2020).

The APP team was tasked with treating immunocompromised patients whose care could not be delayed and whose malignancies made them particularly vulnerable to COVID-19. Given this reality and the patient population's urgent need for care, the team proactively strategized with outpatient colleagues, working together to adapt to system-wide changes and deliver effective, efficient, and safe care during the pandemic.

HOSPITAL-WIDE CHANGES

Starting in March 2020, hospital-wide changes in response to the pandemic affected the day-to-day function of the oncology service. These changes were broadly applied and pertained to entry screening, visitation policies, personal protective equipment, testing protocols, and the consent process.

Throughout the pandemic, symptom screening prior to entry was employed for anyone entering the hospital. During the first several months, onsite thermal screening was required, and people with a fever were denied entry. That has since been phased out, and the hospital now relies on the self-reporting of symptoms, including fever, to gauge whether someone is allowed to enter.

A hospital-wide visitor restriction policy was enforced at two separate time periods during the pandemic based on local COVID-19 infection rates. When these restrictions were enforced, oncology patients were not allowed to have visitors for the duration of their admission unless they met specific exemption criteria approved by hospital administration. At the time of this publication, patients are allowed one healthy caregiver per day, and visitors are screened for any COVID-19 symptoms upon arrival to the hospital. While this strategy has been essential to decreasing the risk of transmission of COVID-19, it has proven to be emotionally challenging for the oncology patient population, given that hospitalization for patients

undergoing aggressive treatment and transplant may exceed 3 weeks. This visitor restriction policy has also been challenging for providers balancing caring for critically ill patients while keeping their families informed and supported at a distance. This has been particularly challenging regarding end-of-life care and decision-making for patients with progressive disease.

Policies around personal protective equipment were fluid as well, changing multiple times throughout the course of the pandemic based on national guidelines. Starting in early April 2020, all employees were required to wear surgical masks for the duration of their shifts. Currently, all visitors are required to wear masks at all times while visiting the hospital. Patients are requested to wear masks whenever a hospital employee or visitor is in their hospital room. Additionally, providers are required to wear eye protection during all patient encounters.

Testing protocols for COVID-19 have been ever-changing in response to the availability of testing supplies. In early March 2020, testing was limited to patients at high risk for COVID-19 given their exposures and symptom profile. At present, inpatient testing is readily available for patients with even a low suspicion of infection, and all patients are ruled out for COVID-19 within 72 hours of admission. On the oncology service, stem cell transplant (SCT) patients must have two negative tests in order to proceed with conditioning chemotherapy. Coordination of testing prior to admission requires that patients have access to testing facilities and involves increased communication with patients prior to admission. However, it prevents providers from making the potentially fatal mistake of giving high-dose chemotherapy to an infected patient and keeps current hospitalized patients safe by avoiding virus exposure.

Finally, the hospital transitioned from a paper consent process to a verbal consent process for procedures, blood transfusions, and chemotherapy. The purpose of this was to limit face-to-face interaction between patients and staff.

ONCOLOGY-SPECIFIC AND SERVICE-LEVEL CHANGES

Beyond the broader changes that took place across the entire hospital, there were additional adjust-

ments made to care delivery processes within the APP team that were tailored to the team's specific patient population. These service-specific changes were focused on the optimization of three categories: the setting of care, physical distancing guidelines, and resource allocation. Again, there were some standards that were adjusted over time as new information surfaced about the virus.

Efforts to Optimize the Setting of Care

Shortly after Philadelphia's first confirmed case of COVID-19, criteria for elective hospital admissions were modified. Patients requiring consolidation chemotherapy for the treatment of acute leukemia were transitioned to outpatient treatment with use of prophylactic antibiotics and growth factor medications as well as close monitoring and outpatient transfusion support. When possible, the APP team collaborated with outpatient infusion colleagues to have lymphoma patients receive chemotherapy at home.

Early in the pandemic, nonemergent autologous SCTs for patients with lymphoma and multiple myeloma were delayed. These patients were instead treated with alternative therapies as a bridge to transplantation at a later date. At present, the team is performing elective autologous SCTs after extensive discussion, weighing the risk of contracting COVID-19 while hospitalized against the benefits of transplantation. The team continued performing allogeneic SCTs throughout the pandemic as scheduled but utilized cryopreserved donor stem cells to ensure donor availability.

The oncology service has been fortunate to have a small number of patients test positive for COVID-19 during their admission at the time of this publication. Initially, the practice was to transfer these patients to dedicated COVID-19 medical units, and APPs served as a consultative service to manage their oncology care. This required a higher level of communication and guidance than a traditional consult service, given the acuity and nuance of patients' oncologic management. As knowledge surrounding COVID-19 infection and management evolved, the practice changed. Currently, the APP team is now caring for patients with COVID-19 on their native oncology units if they have oncologic needs.

Efforts to Optimize Physical Distancing

At the start of the pandemic, the rounding process fundamentally changed, as time at the bedside was limited to protect patients from unnecessary exposure. This was a tremendous shift in the day-to-day practice and was an adjustment for providers, nurses, and patients alike. The process for preparing for rounds involved calling patients by phone to answer questions, offering reassurance, and performing a review of systems. Patients were also called to obtain verbal consent for all procedures and chemotherapy. Time at the bedside was used solely to perform physical exams.

The formal rounding process, which previously consisted of bedside rounds with a multidisciplinary team, became "tabletop rounds" via telephone conference or in person in a socially distanced setting where APPs presented patients to attending physicians. As testing became more readily available and infection rates declined regionally in July 2020, the team returned to the pre-COVID rounding process.

As previously highlighted, one of the biggest challenges was the inability for patients' families and friends to visit the hospital. As a result of this change in policy, the service adopted new methods of promoting caregiver participation in care, including video calls with loved ones during bedside assessments and phone calls to provide updates. When goals of care and end-of-life discussions were warranted, the APP team coordinated with multidisciplinary partners from social work, palliative care, and other consulting services to arrange video or telephone conferences with patients and their loved ones so that everyone could be present virtually.

Efforts to Optimize Resource Allocation

Nationwide blood shortages due to cancelled blood drives and decreased donor availability forced the service to adjust standard transfusion parameters for both red blood cells (RBC) and platelets to conserve the blood bank's limited supply. Prior to the pandemic, standard transfusion parameters were to maintain hemoglobin > 8 g/dL and platelets > $10 \times 10^3/\mu\text{L}$ unless symptomatic. Based on the guidance of a Johns Hopkins study (DeZern et al., 2016), the service decreased the standard RBC transfusion parameter to > 7 g/dL unless clini-

cally indicated. Additionally, the platelet goal was decreased to $> 5 \times 10^3/\mu\text{L}$ based on data regarding bloodless autologous SCT management (Ford et al., 2015). The team was able to safely maintain these parameters and use clinical judgment to determine when higher transfusion goals were necessary. Alternative interventions such as the use of vitamin K and aminocaproic acid were utilized to minimize bleeding risk.

It was also important to optimize human resources. Early in the pandemic, Philadelphia hospitals became acutely aware of the need to prepare for the worst-case scenario should COVID-19 infection rates be as severe in the region as in other parts of the world. As the hospital developed a deployment plan for APPs to staff COVID-19–dedicated ICUs and wards, the service scheduled providers for orientation shifts on these services. Orientation measures were critical to decreasing caregiver anxiety prior to deployment. As providers were deployed onto nononcologic care teams, other providers on the team were asked to work extra shifts to keep provider-to-patient ratios constant. This placed an added burden on the scheduling committee.

Finally, management resources were reallocated. Hospital-based APP managers temporarily transitioned from direct clinical responsibilities to focus their efforts on strategic planning, staff support, and timely communication. The service's manager held frequent virtual team meetings, which served to keep the team informed of the rapidly evolving changes and their impact on existing practices. This forum also created a space to share concerns and collaborate to find the best way to care for patients under these new conditions.

With all of the above changes to the service's processes, the importance of teamwork was more apparent than ever. Employees feared for their own health and wellness and faced challenges with regard to work-life balance, including loss of childcare and in-person schooling, spouses' loss of employment, family member illness, and the emotional toll of isolation. Remaining united as a team was paramount. Having a manager who prioritized communication and strategies to provide support to staff was critical to maintaining team morale during this difficult and unprecedented time. The team took on various new team-building activities, including virtual happy hours, donating to the hospital's

food bank, and finding creative ways to celebrate life events. Supporting each other through the numerous changes and challenges at work was essential to being able to provide excellent care and emotional support to patients and their families.

CONCLUSION

Advanced practice providers care for patients with hematologic malignancies whose treatment is time sensitive and essential. Because of this, the APP team made numerous adjustments to patient care delivery to provide necessary treatment in the midst of the new and ever-changing reality precipitated by the COVID-19 pandemic. Through these changes, the service learned and adapted in real time and discovered creative solutions to challenges that arose.

While many changes were difficult, such as strict visitor restrictions and limited clinician time at the bedside, some changes to practice have proven beneficial. There is knowledge gained from this experience that will inform care in the years to come, and there are lessons learned for if and when another pandemic or roadblock occurs in the future, COVID-19 related or otherwise.

To date, the APP team has seen low rates of hospital-acquired COVID-19 infection. Key elements of this strategy to prevent nosocomial COVID-19 infections have been adhering to strict visitation policies, practicing social distancing, and screening all patients prior to admission. Despite caring for a population at high risk of contracting COVID-19, the APP team has been able to safely manage and protect oncology patients.

Like all health-care workers during the pandemic, the APP team has made substantial adjustments and endured tremendous stressors to provide safe patient care during unprecedented circumstances. The team believes the modifications made to structures and practice were crucial to success during the pandemic. With effective communication, active leadership, a coordinated health system, a culture of teamwork, and staff dedicated to delivering excellent patient care to patients, the team was able to continue to provide high-quality oncology care. The ability to adapt, proactively strategize, and focus on patient safety has allowed the service to excel during an extremely challenging time in health care. ●

Disclosure

The authors have no conflicts of interest to disclose.

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