Models of Care

2

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Introduction/Background

Both the emergency medicine and oncologic communities recognize that cancer patients require specialized emergency care and are better served by professionals who are knowledgeable about their unique needs. Within emergency medicine, this is highlighted by the relatively recent formation of the Society for Academic Emergency Medicine Oncologic Emergencies Interest Group and the Comprehensive Oncologic Emergencies Research Network (CONCERN). Patients often relate stories of being told in their local emergency department (ED) to go to their cancer center for further treatment after emergent conditions have been excluded. Conversely, oncologists rarely have access to EDs with specific oncologic expertise. Patients express concern that emergency physicians in the community are not completely comfortable caring for complex oncologic patients and lack adequate knowledge regarding the management of their disease processes and treatments. As a result of their patients' prior experiences in these less specialized settings, oncologists are often hesitant to recommend such EDs with limited oncologic expertise to their patients. Many oncologists who work in large centers are requesting urgent and emergent after-hours services by personnel who are trained in handling oncologic emergencies. With overcrowding and prolonged waits for treatment that characterize many of our nation's EDs, those with cancer and complex care needs, including immunocompromised, intractable pain, and end-of-life care needs, may best be served in regionalized EDs specializing in oncologic care.

The numbers of cancer patients and survivors among the general population are increasing. The life expectancy of cancer patients has increased significantly in the last six decades. In 2017, there were an estimated 15,760,939 persons living with cancer in the United States alone. In 2020, an estimated 1.8 million additional Americans will be diagnosed with cancer. The 5-year survival rate was estimated to be 67.4% between 2010 and 2016 [1]. With the advent of new therapies and treatment modalities, this survival rate could conceivably increase.

Comparative survival data from the MD Anderson Cancer Registry (The University of Texas MD Anderson Cancer Center, Houston), established in 1944, demonstrate a marked improvement in survival rates for most malignancies. Examples include breast cancer, the 10-year overall survival rate having increased from 25% in 1944 to 76.5% in 1995 for patients treated at MD Anderson. For prostate cancer, the most common malignancy in men, the 10-year survival rate increased from 8.5% in 1944 to 82.5% in 1995. Acute myeloid leukemia was simply fatal in 1944, with a median survival from diagnosis of 8 weeks and a 99% mortality rate at 12 months, but by 2004, the long-term survival rate had increased to over 25%. Remission rates in acute myeloid leukemia patients under age 60 years have reached 65% [2]. Thus, there are many cancer survivors seeking medical care in primary care offices and EDs around the country.

To further highlight the need for such specialized care, there will be an estimated 26 million persons in the United States who either have active cancer or who have been previously diagnosed with cancer in 2040 [3]. Seventy-three percent of this population will be over the age of 65. This ever-growing and aging population will continue to seek emergency care both during and following the diagnosis and treatment of their cancer. Currently, about 4% of all ED visits are made by patients with a cancer diagnosis [4]. This population has a high rate of admission, 59%, when compared to the 16% admission rate for those without cancer [3]. This stems from infection, therapy side effects, manifestations of the malignancy itself, as well as a plethora of hematologic and metabolic derangements. With increasing prevalence, 5-year survival rate, and age of the patient, there

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will be an increasing need to have providers more familiar with cancer and its therapy. This may be best accomplished by personnel with additional experience and training in treating and managing this population.

Several other factors have increased the population of oncologic patients and survivors seeking acute care. In the last few years, more oncologic patients have been receiving treatment as outpatients. Leukemia and stem cell transplant patients spend less time in the hospital and often receive the majority of their chemotherapy in outpatient treatment centers. These patients are no longer universally admitted to the hospital for neutropenia if there is no evidence of infection. Instead, they make frequent trips to the hospital for treatment and laboratory evaluations. Often, patients arrange temporary housing in the area of the oncologic treatment center. This practice has also increased the need for unscheduled acute care. Furthermore, cancer patients and survivors have a combination of medical problems that may or may not be related to their cancer history and a wide range of potential residual medical issues related to their prior disease and/or treatments. Meanwhile, oncologic care is becoming increasingly specialized. Oncologic practice is focusing on emerging treatments and targeted therapies. As more treatment options become available, more expertise is needed in each oncologic subspecialty. With increasing treatment options, there are more potential side effects and treatments available for the supportive care of these patients.

Cancer patients not only suffer from complex medical problems related to their disease and therapy but also are particularly vulnerable emotionally. Patients suffering from a life-threatening illness often have stronger bonds with their medical providers that may be associated with higher expectations for care and an increased sensitivity to their care providers' words or actions; conversations can take on a greater meaning and become more emotionally charged than under normal circumstances [5].

Caring for patients with advanced cancer is stressful for clinicians, and discussing bad news often evokes strong emotional feelings. Not all physicians are formally trained for these difficult communication tasks. End-of-life talks are time-consuming and stressful in any environment, but this is compounded in the ED, where the cancer patient's needs must compete with the treatment demands of other patients. Furthermore, delirium may be far more common in this population than previously thought, which may prevent meaningful discussions in the ED [6]. Unfortunately, evaluation in the ED often reveals progression of the underlying malignancy and may raise the topic of transition to palliative care. Most emergency physicians feel ill-equipped to have this discussion due to the brief nature of their relationship with the patient and lack of depth of understanding of the patient's disease and its progression and possible therapeutic options. At the same time, the patient, faced with new knowledge about disease progression manifested by the symptoms that prompted the emergency visit, may have multiple questions and a high level of anxiety. At this time, the patient is at high risk for feelings of abandonment, especially if the emergency physician is unable to answer questions or provide adequate reassurance that the patient's primary oncologist will be available to them in a timely fashion [5]. Nursing staff may also be unprepared to care for patients who are actively dying, and they may lack the skills to manage end-of-life symptoms.

Despite these needs, there are very few acute care facilities dedicated entirely to the care of cancer patients. MD Anderson and Memorial Sloan Kettering Cancer Center (New York) have such centers. The Ohio State University Wexner Medical Center has an integrated Oncologic Pod within its main ED. Other institutions with a large percentage of oncologic patients are developing resources to provide the specialized care these patients need and to mitigate the difficulties these patients can present to a busy ED. Some institutions are opening fully integrated cancer units within their EDs. They are examining ways to quickly recognize acutely ill oncologic patients so that high-risk patients are treated expeditiously while maintaining an appropriate triage system so that other patients do not perceive oncologic patients as receiving preferential treatment [7].

In this chapter, we describe several models for providing care for oncologic patients in the emergency setting. The models range from EDs at large, dedicated cancer centers (MD Anderson and Memorial Sloan Kettering) to a fully integrated Oncologic Pod that resides within a more traditional ED (The Ohio State University Wexner Medical Center, Columbus, Ohio). These models illustrate some of the pivotal issues of institutions embarking on this endeavor.

Table 2.1 Common issues essential to all oncologic ED models

Recognition and expeditious treatment of oncologic emergencies such as neutropenic fever, spinal cord compression, tumor lysis syndrome, and pulmonary embolism
Appropriate management of pain for patients who are not opioid naïve
Management of frequently needed procedures such as thoracentesis and paracentesis
Early recognition and proper management of patients who have do not resuscitate (DNR) orders or are near the end of life
Knowledgeable management of complications of cancer treatment (chemotherapy, immunotherapy, radiation, CAR-T, and other novel therapies)
Proper communication regarding disease progression with the patient and oncologist
Adequate support from end-of-life services such as palliative care and hospice
Consistent and reliable method of communication with the patients' oncologists
Support for patients who are new to the institution and attracted by the cancer ED designation

Table 2.1 lists common issues that are considered essential to all models of care. Different models for providing emergency care to cancer patients are derived from the variable needs and characteristics of each practice, such as the prevalence of cancer types, the physical and administrative organization of the local oncologic services, and the resources available.

The University of Texas MD Anderson Cancer Center

The Emergency Center at MD Anderson Cancer Center is dedicated exclusively to the care of cancer patients. It is located in the main hospital building and is designated a level III ED by the The Joint Commission and the Centers for Medicare & Medicaid Services. Ninety-eight percent of patients treated in MD Anderson's ED have cancer or a cancer history. The ED has a large role in the inpatient services provided at MD Anderson. Thirty-nine percent of hospital admissions come through the ED [8].

However, MD Anderson did not open its doors with an ED in place. The ED developed gradually as a response to the needs for acute care for the large number of outpatients being treated at MD Anderson. Initially, urgent and emergent services were provided in an open ward. No doctors were assigned to the area, and when a patient requiring emergent care arrived, the patient's physician was notified and sent to the ward to evaluate the patient. This situation was not optimal for acutely ill patients or for patients scheduled in the clinic, and the lack of individual patient rooms made it difficult to maintain patients' privacy and confidentiality [9]. The system was also disruptive for oncologists, who already had full clinical schedules. Eventually, full-time physician coverage was established, initially provided by the Department of General Internal Medicine. In 1986, the ED was formally opened. Initially, it had 23 private rooms and provided care to approximately 14,000 patients per year. In 2007, the emergency center moved to its current expanded location. In 2011, MD Anderson established an academic Department of Emergency Medicine, the first such department dedicated entirely to oncologic emergency medical care, education, and research. The MD Anderson ED currently has 45 private rooms, a six-chair unit, and a two-chair triage bay. The ED is equipped with two resuscitation rooms in which critical care is provided to patients with high acuity that arrive from the clinics, walk-in, or arrive by ambulance. The ED now sees over 26,000 patient visits annually. All of the patients have cancer or are cancer survivors, except for an occasional family member of a patient or an employee.

The ED is staffed with full-time faculty members, the majority of whom are board certified in internal medicine or emergency medicine. Some faculty members are board certified in surgery, pediatrics, or infectious disease or palliative medicine. The physicians are faculty at the University of Texas and have similar academic obligations for research, administration, and teaching as other MD Anderson faculty members. The Department of Emergency Medicine recently initiated an oncologic emergency medicine fellowship, now in its eighth year. Mid-level providers are utilized in the ED, but provide a relatively small portion of the care delivered.

The department's 19 faculty members provide round-the-clock coverage. Coverage ranges from two to six physicians with an additional mid-level provider at the busiest times. The ED employs approximately 75 registered nurses with a nurse-to-patient ratio of approximately 1 to 3.

Care and treatment decisions are made by the emergency medicine faculty. However, oncologists do provide a call schedule, and there is frequent communication on an as-needed basis between the emergency physicians and primary oncologists. Oncologists do not routinely round in the ED unless they have admitted patients boarding there. The electronic medical record provides full access to the patient's medical record. Oncologists can notify the ED staff of a patient's pending arrival with the addition of important clinical information by entering a note in the medical record. After patients are seen, a note is generated by the emergency physician notifying the primary oncologist that the patient was seen. If consultation is warranted, the oncologist is contacted by phone.

The average ED length of stay is just over 6 h for a non-admitted patient and over 9 h for an admitted patient. The ED admits 51% of the patients presenting for treatment. Approximately 30% of unique patients have hematologic tumors (leukemia or lymphoma) or have received stem cell transplantation, comprising 50.3% of all patient visits; the remainder have solid tumors [7].

Of all the patients visiting the ED in 2010, hematologic patients averaged 2.2 visits per patient, and solid tumor patients averaged 1.8. Of these patients, 12% had four visits or more, with a range of 1–31 visits per patient. Most patients were receiving multiple medications and presented with several complaints. The complexity of their illness and frequent requirements for intravenous fluids, antibiotics, electrolytes, and blood products results in a prolonged length of stay compared to other EDs. The high level of acuity is reflected in the 10.9% mortality rate associated with admission of these patients [7]. The mortality rate is higher for patients with hematologic tumors (13.6%) than for patients with solid tumors (9.8%).

Patients present to the oncologic ED with a multitude of different complaints. At MD Anderson, the most common chief complaint is fever, present in 23% of patients. This is closely followed by abdominal pain, generalized pain, shortness of breath, nausea and vomiting, weakness and fatigue, back pain, chest pain, bleeding, cough, and diarrhea.

Memorial Sloan Kettering Cancer Center

Memorial Sloan Kettering has an Urgent Care Center (UCC), dedicated solely to the care of oncologic patients. The number of patient encounters per year in the UCC has steadily increased from 14,800 in 2000 to 21,800 in 2013. Although the UCC receives Memorial patients who arrive from the community via ambulance, general 911 calls from the community are not brought to Memorial. The physical size of the unit has grown over time. Originally an eight-bed unit with an adjunct clinic space, the UCC now consists of 19 telemetry beds and 4 transfusion chairs. Turnover of these beds occurs more than four times per day.

The driving forces behind this growth are an increase in the number of patients receiving treatment at Memorial Sloan Kettering and the continued transition of oncologic care away from the inpatient setting. As cancer treatment paradigms change, the UCC is key to the institution's ability to provide acute evaluation and management to an increasingly large and complicated outpatient population. The recent addition of a freestanding same-day surgical center and the continued expansion of the outpatient bone marrow transplantation program are examples of the trend toward outpatient treatment of cancer patients.

The clinical staff consists of 13 full-time board-certified internal medicine physicians, some of whom have completed subspecialty training in palliative care, anesthesia/critical care, and infectious disease. UCC physicians are considered academic faculty who are responsible for teaching medical students and residents from Weill Cornell Medical College, as well as participating in clinical research.

Patients treated in the UCC reflect the spectrum of disease seen at Memorial. Most patients have solid tumors (72%) and are evaluated for acute complications of their disease and treatment. The most common chief complaints include dyspnea (17%), fever (14%), pain (11%), nausea (10%), and fluid/electrolyte disturbances (9%). The average length of stay in the UCC is 4 h, and slightly more than half of the patients seen in the UCC will require admission to the hospital. Occasionally, patients with advanced disease who have been treated at other institutions or individuals with a suspected but unconfirmed cancer diagnosis seek to transfer their care by visiting the UCC. Emergent problems are acutely managed; however, referral for expedited outpatient evaluation is the preferred pathway, as the UCC is not intended to be the first point of contact for a new patient.

The UCC has attempted to integrate successful models of care from emergency medicine as volume and throughput have increased. A modified Emergency Severity Index (ESI) tool is used for triage. Patients are assigned a score of 1–5 based on the need for a lifesaving intervention, the presence of a high-risk situation, the number of resources a patient will require, and predefined vital signs. Specific triaging emphases that reflect the unit's focus on oncologic include with the rapid identification any of the following conditions: recent bone marrow transplantation, febrile neutropenia, and potential spinal cord compression. During peak hours, a UCC physician assists the triage nurse, a model that has been associated with faster throughput and improved patient outcomes in non-cancer EDs [10].

As many patients are referred internally by treating oncologists and surgeons, an electronic "UCC Notification Order" allows these individuals to communicate the most likely diagnosis, the need for admission, and which tests and consultants will expedite care.

Oncologic patients have an inherent risk for developing sepsis. An institutionally derived algorithm is used to screen all electronically documented vital signs for sepsis. When potentially significant abnormalities are identified, an alert is triggered, prompting a clinician to assess the patient for the possibility of sepsis. This process is time sensitive and requires the clinician to either document a reason for exclusion (dehydration, arrhythmia, end-of-life/palliative care, etc.) or acknowledge the alert and initiate the sepsis management protocol within 30 min.

Patients who arrive critically ill and in need of an immediate intervention such as endotracheal intubation, cardiopulmonary resuscitation, or initiation of vasopressor support are frequent challenges in cancer EDs. At Memorial Sloan Kettering, the primary oncologist has often already established and documented the goals of care in the electronic medical record. If the patient has previously consented to a do not resuscitate (DNR) order, this information is displayed in the header at the top of the screen, next to the patient's name and medical record number. This order must be confirmed and renewed with each hospitalization, as per New York State law. For critically ill patients without previously established advanced directives, the UCC clinician will rapidly determine the goals of care with the patient, healthcare proxy, and primary physician at MSK. For individuals who decline life-sustaining interventions, the UCC clinician will enter a DNR order and initiate palliative care. Preexisting order sets for narcotic analgesia and a palliative care consultant facilitate care. A medical ethics consultation service is available 24 h a day for encounters in which the goals of care are difficult to establish.

A Fast-Track Pathway is used for patients with a low Emergency Severity Index (ESI) score. One of the most common diagnoses in this group is a new, suspected, or incidentally identified thromboembolic disease. If anticoagulation is indicated, the patient is often discharged on rivaroxaban with close follow-up in the Anticoagulation Management Clinic.

In July 2013, the UCC opened an observation unit, intended for patients who were unsuitable for discharge but had an expected duration of care lasting less than 24 h. Although the observation unit is physically located in the hospital, this nine-bed unit is considered an outpatient service and is staffed by UCC physicians and mid-level provid-

ers. During the first 6 months of the program, roughly 10% of UCC visits ($n = 1013$) resulted in patient placement in the observation unit. The proportion of admissions to the hospital from the UCC with a length of stay less than 24 h dropped significantly after observation unit implementation (2.4–1.1%). The most common reasons for observation unit placement are fluid and electrolyte disorders (14%), pain control (14%), dyspnea (13%), and fever (9%). Interventions for patients in the observation unit include placement or revision of drainage catheters (pleural, biliary, genitourinary tract, abscess); endoscopy and transfusion in patients with hemodynamically stable gastrointestinal bleeding; correction of uncomplicated electrolyte derangements; administration of intravenous (IV), antiemetics, IV antibiotics (for treatment of cellulitis, pneumonia, and uncomplicated febrile neutropenia), or IV analgesia; and the management of severe constipation. Approximately one-third of patients placed in the observation unit require admission to the hospital for ongoing care. Extending the observation period to 48 h may decrease this number.

Approximately 15 patients a week are seen in the UCC for elective palliative paracentesis, performed by the UCC clinical staff. Drainage of symptomatic pleural effusions is performed in the observation unit by pulmonary medicine. Patients with low-risk febrile neutropenia are either discharged or placed in the observation unit for 24 h.

When possible, management decisions are made with input from a patient's primary oncologist or surgeon, who is notified automatically by e-mail during check-in and discharge. While these individuals may be off-site, they are able to review all relevant clinical data, including lab findings, chart notes, and radiology and telemetry results. An electronic status board, visible on all computer terminals within the institution and on overhead monitors in the UCC, facilitates a quick grasp of key metrics related to an individual patient and overall throughput at any given time. This tool facilitates communication about arrival and waiting times, identification of treating or covering UCC staff, pending diagnostic tests and consultants, disposition (admitted/discharged/observed), and bed status.

The Ohio State University Comprehensive Cancer Center: Arthur G. James Cancer Hospital and Richard J. Solove Research Institute

In April 2015, the Ohio State University Wexner Medical Center (OSUWMC) opened a new, specialized pod in the ED to care for its cancer population. The ED, which houses the newly named Oncologic Pod, currently cares for all patients that arrive to OSUWMC seeking emergency care: approximately 82,000 patients per year. The Oncologic Pod currently evaluates, manages, and treats approximately 11,000 oncologic and hematology patients per year, which reflects over 13% of emergency visits to the OSUWMC ED. With opening of the Oncologic Pod, the ED dealt with many challenges as illustrated in Table 2.2, beginning with patient identification. The hematology and oncologic patients are identified immediately upon arrival during the triage process. Patients who arrive to the ED are asked two screening questions: "Have you seen a cancer doctor or doctor at the James in the last 12 months?" and "Are you currently undergoing active treatment for cancer?". An affirmative answer to either question allows for preferential placement into the Oncologic Pod, which is fully integrated within the ED.

Table 2.2 Challenges to an integrated Oncologic Pod

Early identification of the hematology and oncologic patient
Equitable triage and placement for all ED patients
Identification of febrile neutropenia and other subtle, life-threatening oncologic emergencies
Waiting areas for the immunocompromised patient
Available bed space
High ESI level in the cancer population
High admission rate in the cancer population

One of the many challenges that the ED initially faced was the development of triage criteria to effectively triage cancer patients to the Oncologic Pod while maintaining equity among all patients that presented for evaluation. The Oncologic Pod originally opened with 10 beds and 5 additional chairs for a total of 15 treatment spaces that were allocated to the care of cancer patients. Ten of the rooms were private, four had private bathrooms, and two had negative airflow. The other five spaces were treatment bays with lounge chairs for infusions. With rising acuity and increasing number of cancer patients arriving to the ED, these treatment bays were renovated to include telemetry and actual ED beds, instead of the initially planned chairs. Additionally, the ability to flex up to 19 treatment spaces was created through the addition of four hallway beds. Patients may be placed in a hallway bed to facilitate early treatment while awaiting placement in a room or treatment bay. On days when a larger number of oncologic and hematology patient visit than the 15-bed/19-treatment space pod can accommodate, additional patients will be evaluated in the remainder of the ED when space is available. If a high acuity patient arrives to the ED and the Oncologic Pod is full, then that patient may be placed in a bed outside of the Oncologic Pod to facilitate prompt treatment of the emergent medical condition. Similarly, when there are fewer Oncologic Pod patients, non-cancer patients will be evaluated as needed in the Oncologic Pod. This will ensure equal access to emergency care for all patients, regardless of their disease state.

After the initial triage process, patients are either placed in an available treatment space or escorted to the waiting

room. The waiting room represented an additional challenge. With the steadily rising number of ED visits by cancer patients, concerns arose in placing what could certainly be an immunocompromised population in the main ED waiting room. The main ED population often sought care for viral or bacterial illnesses. Such illnesses could prove life threatening for the immunocompromised cancer patient. Out of concerns for patient safety, an additional waiting area for cancer patients was created that allowed for better isolation and distancing. The cancer population viewed this as a significant improvement in their ED encounters. Hand sanitizer and facial masks are readily available for patient use in this area.

After patients are placed into a treatment space, they are cared for by a multidisciplinary team in the Oncologic Pod. This team is composed of physicians, advanced practice providers, nurses, patient care associates, patient experience representatives, social workers, case management, and dedicated emergency medicine trained pharmacists. All physicians that care for these patients are either board certified in emergency medicine or board eligible for the American Board of Emergency Medicine certifying board exam. The physician group provides 24/7 oversight of the Oncologic Pod. There are 16 hours (two, 8-hour shifts) of dedicated physician coverage in the Oncologic Pod. This runs from 9 a.m. until 1 a.m. During this time period, the dedicated physician is responsible only for care in the Oncologic Pod. Additional physician staffing throughout the department enables this physician to dedicate all of their time on shift to the cancer population. From 1 a.m. until 9 a.m., an emergency physician provides oversight in the Oncologic Pod as well as an adjacent ED area. The decision for this staffing model was based on ED arrival times of the cancer population at the OSUWMC ED, which consistently demonstrated fewer arrivals in the 1 a.m. to 9 a.m. time period on all days of the week.

To assist the physician in caring for patients, a group of advanced practice providers (APPs) staff the Oncologic Pod. This group, a mixture of both nurse practitioners and physician assistants, is dedicated solely to the care of patients in the Oncologic Pod. The APP staff provide 48 hours of coverage daily in the Oncologic Pod. This is broken down into four, 12-hour shifts with overlapping coverage. During the onboarding process, the APP staff are cross-trained in the ED and the cancer center. This includes time in the Oncologic Pod as well as rotating with the hematology, oncologic, and neuro-oncologic services. Depending on provider preference, they may also spend time with radiation oncologic or one of the many surgical services for the hospital. The off-service onboarding process prepares the APP staff for the variety of cancers and treatments that they may encounter in their role as providers. Their time onboarding in the ED further prepares them for the variety of presentations that they may encounter in their role. The APP team evaluates the vast majority of patients in the Oncologic Pod. If there is an influx of patients, then resident physicians, who staff the adjacent pod, are readily available to assist in evaluating the cancer population. Additionally, they have 24/7 access to a board-certified emergency physician. Through the combination of onboarding, monthly meetings, CME, and personal education, the APP staff is more than adequately prepared to deal with any oncologic emergency that comes through the door.

The work of the providers would be naught without additional staff. The Oncologic Pod has a dedicated nursing staff. The vast majority have had training either in the care of the oncologic patient or in an ED. The nursing staff is acutely aware of the presence of ports and use of other intravascular access devices. They are attuned to the needs of this particular population including aggressive symptom control and need for expeditious evaluation of a fever. The nursing staff is aided by patient care associates, up to three at a time, who help with additional tasks in the area. To help complement the immediate patient care side, 24-hour social work is available for the patients. Every cancer patient who is roomed in the ED is evaluated by a social worker to discuss living situations, safety, and advanced directives. The social work team is readily available to assist the population around the clock. Case managers also help with coordination of care. They are available to connect the differing care teams as well as to establish appointments for patients being discharged from the Oncologic Pod. Finally, the Oncologic Pod has a dedicated pharmacist, trained in emergency pharmacology. They help with a variety of issues, including antibiotic selection, antibiotic dosing, symptom control, and any other pharmacotherapeutic questions the treatment team may have. They are a valuable resource as cancer treatments continue to evolve.

One important scenario to emphasize is the patient with neutropenic fever. These patients are often difficult, but critical, to recognize. Current guidelines recommend that these patients receive antibiotics within 1 hour of triage and be monitored for 4 hours following antibiotic administration [11]. Many of these patients may appear well and traditionally have had to wait with other patients for further evaluation. Unfortunately, a prolonged time to antibiotics can result in deterioration and development of sepsis. To improve the management of these patients, the Oncologic Pod has the criterion that any patient with a fever who has received chemotherapy or radiation in the prior 2 weeks will be evaluated under the ED Sepsis Alert process. This process brings together a multidisciplinary team (physicians, nursing, radiology, pharmacy, etc.) to expedite initiation of IV antibiotics and diagnostic work-up for this high-risk population of patients.

As treatments advance, there is the ongoing need for increasing flexibility in triage. With the FDA approval of CAR-T therapy, new challenges arose. For this reason, any

patient on CAR-T therapy in the James Cancer Center is provided with a card to present upon arrival to ANY ED. This details their therapy and possible side effects including complement release syndrome and neurologic side effects. The card also contains a number for outside hospitals to call for guidance on treatment. At the OSUWMC ED triage, a third screening question was recently added to help identify this population upon ED arrival. Other oncologic emergencies may be harder to identify. However, with the Oncologic Pod screening pod questions at triage, patients are immediately flagged as cancer patients upon arrival. This gives the Oncologic Pod physician and APPs, as well as the provider in triage, the opportunity to review the patient chart, chief complaint, and triage note. These providers are able to work with the triage nurses and charge nurses to expedite care of the cancer population including ordering CT scans, labs, or symptom control in triage. They can also increase or decrease the ESI or recommend that a certain patient get the next available treatment space if there is a concern for other subtle oncologic emergencies.

Other challenging scenarios that the Oncologic Pod has encountered include the arrival of patients without a clinical cancer diagnosis. An inpatient service was designed that handles the care for patients without a definite cancer diagnosis but identified as being at high risk for malignancy (i.e., new, large lung mass or abdominal mass). This facilitates the care of patients with a presumed diagnosis of cancer who may be attracted to the cancer ED, either based on outpatient imaging or as transfers from outside hospitals. This allows for patients who are not already receiving their cancer care at the James Cancer Center to be seen in the Oncologic Pod to facilitate transition of their care to the cancer center. Additionally, if patients do not require hospital admission for this work-up, a James Diagnostic Clinic can facilitate an expedited work-up for outpatients. The Oncologic Pod serves as the first point of contact of the James Cancer Center for one to two patients per day, so this is not an unusual scenario. While there is month-to-month fluctuation, this number has generally increased since the genesis of the Oncologic Pod in 2015.

As patient volumes rose over time, it became apparent that there was not only a growing need for emergent cancer care but also the need for acute, unscheduled visits. The acute, unscheduled visit encompassed patients who might need to see a provider, though do not necessarily need an ED encounter. This could range from fever in patients not on cytotoxic chemotherapies, anemia, thrombocytopenia, electrolyte abnormalities on routine labs that need follow-up, ED follow-up, or even clinic overflow when patients are not able to see their primary team. This necessitated the development of an additional eight-bed treatment space, the Immediate Care Clinic (ICC). The ICC is a 24/7 treatment space that opened in 2018. Patients established with the James Cancer Center, or in the process of establishing care, can be referred to the ICC by their provider, the ED, or the nursing triage line. Certain exclusion criteria were created to prevent those with true emergencies from arriving at the ICC. Such patients are redirected to the ED for emergent care. The ICC is staffed by the same APP group as the Oncologic Pod. It is overseen by the Oncologic Pod emergency physician. The ICC admission rate is consistently below 30%. It serves as an intermediary between the ED and outpatient worlds. This allows for lower acuity patients to be seen promptly when ED volumes are high and prevent unnecessary ED visits, increased charges to the patient, and increased overall healthcare costs.

It is one thing to establish an Oncologic Pod for cancer patients, and yet another to ensure that quality standards are being met. In order to assure that patient care is performed at the highest professional standards, there are regular evaluations of specific ED metrics. This occurs both at the level of the Department of Emergency Medicine and at the hospital level. A monthly scorecard containing information such as patient arrivals, door to provider, length of stay, admission rate, and new patient contacts is disseminated to the administration of both the hospital and ED. It is regularly reviewed by the Department of Emergency Medicine administration in conjunction with nursing leadership. It is also reviewed semiannually at the hospital level in forums such as the Patient Quality, Safety, and Reliability Committee and the Medical Staff Advisory Committee and with the Chief Medical Officer of the James Cancer Center. To ensure that patient voices are heard, patient experience representatives are available to speak with patients. Additionally, all patients who arrive are provided with a direct phone number to the patient experience representative line in the event they wish to express gratitude or concern about their ED stay. These accolades and concerns are reviewed and addressed on a weekly basis in a multidisciplinary meeting including patient experience, physician leadership, and nursing leadership. These measures ensure that high-quality care is being delivered to the patients and that all needs and expectations are met.

Current and Future Considerations for the Cancer Emergency Department

Increasing specialization has resulted in a fragmentation of medical care and cancer care is no exception. Many oncologic patients are treated by several physicians who are all specialists in cancer therapy. One patient may have one or more surgeons, a medical oncologist, a radiation oncologist, and a palliative care physician. This does not include other specialists for chronic issues or problems that develop during treatment, including cardiologists, nephrologists, endocrinologists, and pulmonologists. Patients are often confused as

to which doctor is "in charge" and whom to ask which question. The role of the emergency physician in a comprehensive cancer center has some similarities to that of a primary care physician. The ED physician often explains the roles of the different providers and facilitates communication between the various specialties involved in the patients' care. Another important role is that of a safety net, by providing care to the patients when they cannot wait for an office visit or when the office visit results in the discovery of a problem that is beyond the scope of the oncologist or specialist. In these roles, the ED supports both oncologists and patients. Physicians specializing in oncologic emergencies use unique skills and knowledge of potentially dangerous complications of different treatment modalities and the best supportive therapies as well as understanding of the disease process of multiple different malignancies and their associated emergencies. Also valuable are expertise in pain management, procedures commonly needed in cancer patients, and skillful management of palliative and end-of-life care. This skill set, which currently can only be obtained through experience, helps doctors who specialize in the acute care of cancer patients make decisions regarding the aggressive or supportive nature of care provided in the cancer ED.

Several themes are prevalent in the acute care of cancer patients. One of the concerns expressed by physicians seeking to provide acute care to oncologic patients is access to the complete medical record and the expertise of the oncologist. The ED physicians must have a significant understanding of the treatment paths and modalities of the patients they are seeing. In order to make appropriate decisions, communication must be available with the oncologist and other supportive services. With more knowledge and experience, the emergency physician can be more effective in support of the patients and the oncologists and be more confident in their independent decision-making. A method of documentation and a process of communication that make the primary oncologist aware of all visits to the ED are optimal. At MD Anderson, an online medical record documents the visit and outcome, and is accompanied by an e-mail notifying the oncologist of the emergency visit, closing the communication loop. Memorial Sloan Kettering has gone one step further by posting the ED tracking board throughout the institution. At the The Ohio State University Wexner Medical Center, oncologic teams are notified of emergent visits by e-mail. They are also available to discuss patient care in real time through a variety of modalities.

Another common concern is that caring for this group of patients is very labor intensive. These patients are often very ill; many of them are not independently ambulatory. Most of the patients are on multiple medications and have numerous comorbidities and several complaints. Due to the complexity of their illness, their stay in the ED is longer than that of other populations. Many of the patients require electrolytes or blood replacement as an incidental finding or the reason for the visit. These processes add to the time in the ED and the nursing workload. The ubiquitous admission rate of over 50% and the high mortality rate of patients admitted through the ED are further testimony to the high acuity level of the patients [3].

An ED that treats only cancer patients does not have to devise a triage method to identify the cancer patients from the non-cancer patients, and recognition of neutropenic fever, sepsis, and infection with underlying immunocompromised is routine. Other problems, such as managing intractable pain and mixing and adjusting large doses of opioids, are a frequent occurrence. However, these are issues that EDs—who want to support a large cancer population but cannot be dedicated solely to that population—contend with. A frequent issue more unique to a cancer ED is the arrival of patients with a recent diagnosis of suspected or confirmed malignancy. One of the challenges of working in a cancer ED is handling a group of patients with varying degrees of illness, varying knowledge about their condition, and different stages of diagnosis who have recently received difficult news and are emotionally charged. In all of the functioning cancer EDs interviewed, avoiding having the cancer ED serve as the intake portal for the cancer institute has been a common theme. Another frequent challenge is patients with late-stage cancer with no prior relationship to the parent institution. Many of these patients have received treatment at other centers and when told that no further treatment options exist, go to the cancer ED hoping for a salvation therapy. These patients are often too sick to be discharged and, without the evaluation of an oncologist in the emergency center, will ultimately be admitted to the hospital for an expert opinion and transition to supportive care or hospice. A consulting service that is available to see such patients in the ED would make this process more satisfactory.

Therapeutic procedures frequently utilized in cancer patients necessitate the development of certain services. Oncologic patients have a frequent need for invasive procedures such as thoracentesis, paracentesis, stenting, and percutaneous drainage. Some of these procedures can be done by ED physicians, but they are time-consuming and difficult to perform in a busy ED. Several institutions have dedicated teams to help facilitate these procedures. Another common diagnosis is the incidental finding of pulmonary embolus on CT scans. Many of these patients are handled in the emergency centers at Memorial Sloan Kettering, MD Anderson, and OSUWMC.

The optimal medical management of many cancer-related emergencies is an excellent area for further research. Many practice patterns are based on expert opinion or prior experience rather than clinical trials. Formal training for treatment of oncologic emergencies is still up and coming, though models do exist [12]. Otherwise, this skill set currently must be learned through work experience. Examples of frequently treated problems that could be better supported by research are treatment of hyponatremia and hypercalcemia of malignancy, rescue treatment of chemotherapy- or radiation-induced nausea and vomiting, chemotherapy- or radiation-induced diarrhea and mucositis, chemotherapy-induced peripheral neuropathic pain, pain related to colony-stimulating growth factors, dosage of steroids and radiation in malignant spinal cord compression, and acute management of narcotic-induced constipation. Other important areas include treatment of therapy-associated skin rashes and management of medical problems with unique complications, such as venous thromboembolism and acute coronary syndrome in thrombocytopenic patients and anticoagulation of patients who have metastatic disease to the brain.

In summary, the care model used for patients with oncologic emergencies must be tailored to the local medical and oncologic environment; therefore, it naturally follows that different medical systems have developed different processes to care for these patients. A constant among the models discussed here is the underlying goal of care being provided to these patients by clinicians who are knowledgeable about their needs and have integrated communication with the primary oncologists. Acute care of the oncologic patient is gaining recognition as an important area that could be improved upon with increased training, research, and emphasis on integration into the oncologic system.

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